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# THE ROLE OF PUBLIC INVESTMENT IN PROMOTING ECONOMIC GROWTH

## HEARING

BEFORE THE

## COMMITTEE ON FINANCIAL SERVICES
## U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

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# THE ROLE OF PUBLIC INVESTMENT IN PROMOTING ECONOMIC GROWTH

**Friday, March 23, 2007**

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON FINANCIAL SERVICES,
*Washington, D.C.*

The committee met, pursuant to notice, at 2:05 p.m., in room 2128, Rayburn House Office Building, Hon. Barney Frank [chairman of the committee] presiding.

Present: Representatives Frank, Maloney, Moore of Kansas, Green, Cleaver; Neugebauer, and Campbell.

The CHAIRMAN. The gentleman from Texas is from Houston. He has been Mr. Hospitality this year because his City is the lead place where people have been welcomed from New Orleans, so he's been in a very welcoming mood for longer than he should have had to be.

This hearing of the Committee on Financial Services will come to order. I begin with an apology and expression of gratitude to the witnesses. It has been a busy week, and I had anticipated unnecessarily that we might have a spillover this morning. I very much appreciate your accommodating us on a busy Friday afternoon. I understand that Mr. Rohatyn is going to have to leave, and it's our fault, not the fault of any members of the panel. We are appreciative.

We're going to get right into this. This committee has, of course, legislative jurisdiction in specific areas involving housing and financial services. We also have jurisdiction over the Humphrey-Hawkins Act and the question of economic policy in America in general.

One aspect of this that we are focused on is the problem we are confronting in the United States, as well as in other parts of the world, about how you go forward with economic growth in a way that does not exacerbate social problems and in a way that does not provide more inequality. Obviously, our capitalist system requires inequality. It is a good thing in the appropriate amounts, but too much inequality can become socially dysfunctional. It might even become politically dysfunctional, and this committee is going to be talking to thoughtful people all year about how we go forward.

One aspect that I believe in very strongly is being overlooked in the current situation and that is the contribution that should be made by the public sector. I do not regard support for a vigorous public sector as in any way a denigration of the private sector. Our system requires both. And when you talk about diminishing in-

equality, not getting rid of it, but preventing it from growing as growth comes, I believe we need more reliance on the public sector as a part of that effort than we've had. How you do it, we can talk about.

So this is a piece of that discussion. It's the role of public investment in promoting economic growth, and in promoting economic growth in a way that makes it sustainable by giving the great majority of the public a view that they have a stake in it.

Do either of the other members wish to make an opening statement? If not, we will begin with our witnesses, again with my thanks for accommodating us. We'll begin with Mr. Rohatyn. Ambassador, please go forward.

**STATEMENT OF AMBASSADOR FELIX G. ROHATYN, ROHATYN ASSOCIATES LLC**

Mr. ROHATYN. Mr. Chairman and members of the committee, it's a great privilege to be here today to discuss a critical issue—the need for large-scale public investment in projects that will modernize our Nation and enrich our people.

Throughout our history, and until the 1960's, the Federal Government played a dominant role in our level of public investment, while the States played a secondary role. This has changed since then. Public investment has, by tradition, meant infrastructure: roads, trains, bridges, public transportation, public schools, etc., have provided the private sector with the complementary investments which improve business productivity, our standard of living, and our quality of life. Largely the product of a Federal, State and local partnership, it was badly neglected over the years, principally by the failure of the Federal Government to maintain its level of participation.

The American Society of Civil Engineers has estimated that it would take $1.6 trillion dollars over a 5-year period to bring America's infrastructure to a reasonable standard of adequacy and that this requirement increases by about $300 billion every 2 years.

Mr. Chairman, I have for many years recognized our government's historic role as the indispensable investor in the economy of our country. I hope that your support will encourage the Congress to undertake the major effort needed in rebuilding America before it is too late. In order to do so, we must counteract the present theology that all public investment is wasteful and that neither taxes nor borrowing can be justified for that purpose.

It is also worth noting that the financing of public infrastructure creates hundreds of thousands of private sector jobs, which is particularly important when globalization is putting pressure on American industrial employment.

Fortunately, past American political leaders did not always think this way. As we look to our Nation's future, we should also look back at the history of great public investments, at the precedents set by leaders who made many of the critical commitments that became the backbone of our Nation; we should reflect on the actions of those leaders who used government power and public finance to make the investments that formed this country; and we should celebrate their historic achievements by continuing to invest boldly and wisely in America's future.

As the political, geographic, and economic structure of America took shape in the 19th and early 20th centuries, public investments such as the Louisiana Purchase, the Erie Canal, the Transcontinental Railroad, the RFC, and the interstate highway system shaped our economy and our security structure. Although the private sector has been the mainstay of our economy, it could not exist without this platform and the political leaders who made those decisions—Jefferson, DeWitt, Clinton, Lincoln, FDR, and Eisenhower.

Since the beginning of the Republic, transportation, infrastructure, and education have played a central role in advancing the American economy: whether it was the canals in upstate New York or the railroads that linked our heartland to our industrial centers; the opening of education to average Americans by land grant colleges and the GI Bill, making education basic to American life; or the interstate highway system that ultimately connected all regions of the Nation.

This did not happen by chance, but was the result of major investments financed by the Federal and State Governments over the last century-and-a-half. Mr. Chairman, we need to make similar investments now.

Of course, not all government investments have been successful. The endless earmarks, political pork in too many projects, corruption in military contracts, and the recurring problems in NASA and many others are proof that there is no such thing as perfection in the public sector any more than in the private sector. But the private sector has also had its Enrons and its Worldcoms, as well as its earlier scandals, which caused Teddy Roosevelt to break up the trusts and FDR to regulate the securities markets.

But the consistent ideological attack on public investment is bringing this country to its knees. Witness the outrage of New Orleans, the state of our public schools, our pollution, and our wasteful use of energy. Without adequate levels of public investment, our private sector will lose much of its competitiveness and outsource more and more of our requirements in goods as well as services, constantly increasing our foreign debt and losing domestic jobs.

The recent decades have been the best of times for private investment. For public investments, they have been disastrous.

My views on economic and social issues have been shaped not only by my years in business and in government, but also by my experiences as a child and as a refugee fleeing from the Nazis and seeking asylum in America during World War II. During the war years, I had from to time heard FDR's voice on the radio, sometimes on clandestine sets, which shaped almost by osmosis my views of America. To me, America was the platform for freedom, fairness, and opportunity, and I have never wavered from these views.

My involvement in public life began in the spring of 1975 when New York City was caught in a financial death spiral. In the 1960's, the City had lost 300,000 private sector jobs, and in the early 1970's, the City's economy had slowed sharply during a national recession, aggravated by the Arab oil embargo. Our capital investment program had been wiped out. The City was shut out of the financial markets and headed for bankruptcy.

To regain market access, we needed a plan which would revive the City's economy, eliminate its deficit, and revive its moribund capital investment program. We needed a plan with Federal backing.

In the summer of 1975, when Governor Carey appointed me chairman of New York's Municipal Assistance Corporation, I believed that bringing the City back to the market would take a few months. It actually took several years and required the courageous political leadership of Governor Carey and Mayor Koch, the strong support of the City's labor unions and of its banks, and ultimately, it required credit from the Federal Government in the form of seasonal loans.

The Federal credit support enabled the union pension funds and the private financial institutions to bring their own support to the City, and as a result, the City balanced its budget, reentered the financial markets, and for the next 20 years, the City's economy was strong, its budgets were balanced, and it was able to make the vital investments in its infrastructure. It could not have happened without the credit support of the Federal Government and the sacrifices of its citizens.

It is also worth noting that the City repaid 100 percent of its debt to the Federal Government ahead of schedule, and that the Federal Government did not have to face the staggering national cost of a New York City bankruptcy.

Today, support for any government intervention in the economy has become anathema, and this has frightened too many Americans into ignoring the long and positive history of government investment in our land. Furthermore, the illogical rules of government accounting and the fear of further deficits make this a very difficult political issue.

As opposed to businesses, States, and local governments, the Federal Government accounts do not differentiate between long-term investment and everyday operating expenses. They treat construction of a dam as if it were a welfare check and record the debt incurred as a deficit without the offsetting assets represented by the dams. If our private sector companies were to keep their books in this fashion, they would report losses instead of profits, they would cut back on investment and employment in order to show earnings, and they would ultimately go out of business.

The idea that government intervention is always bad has had consequences. The recent catastrophe of New Orleans was an event waiting to happen. If not in New Orleans, it would have happened somewhere else. It is the result of a national failure to make public investments adequately and intelligently—in the case of New Orleans, inadequate investment necessary to prevent the flooding of New Orleans, and the failure to have in place an effective emergency response system.

Modern market capitalism and the links of the financial markets to advanced information technology have created a formidable engine for the creation of wealth, and we have, in my judgment, the best economic system in the world. This wealth, however, is heavily weighted toward the private sector, and has resulted in the neglect and decay of public facilities, including that of our public schools. The sensitivity of the financial markets to government spending be-

came a powerful brake on public investment, because the arbiter of financial policy is a government accounting system that treats investment as an expense and a bond market fearful of deficits, regardless of their origins.

The combination of these notions, namely, that government cannot do trading agreement right, and that long-term public investments are the equivalent of welfare payments, has caused a steady erosion in Federal funding for infrastructure and other initiatives that would spur progress and economic growth, leaving more and more to State and local governments, which cannot provide adequate support. That is the road that led to New Orleans.

As we fail to make large public investments—

The CHAIRMAN. Mr. Rohatyn, could you sum up in another minute, and then—

Mr. ROHATYN. Certainly, sir.

The CHAIRMAN. Thank you.

Mr. ROHATYN. I certainly can. A Federal capital budget would help correct our problems. You all know the political hurdles of such a budget, but their existence should not automatically doom the idea. However, if we are unable to institute a capital budget, there is a recent development that suggests another remedy—the return of the 30-year Treasury bond, because long-term bonds should finance capital assets, and their issuance should be dedicated to that purpose. Even longer maturities, such as 50-year bonds, should be envisaged. That is what the European Union does to fund its systems.

To help deal with our shortage of capital investment, the Congress could authorize a trust fund to be financed over a 5-year period by special purpose 50-year Treasuries. The fund could be used to co-finance high priority national, regional, and local infrastructure programs, as well as special projects which generate advanced intellectual property. Private capital should be an integral part of the program. Tight control should be applied to the operations, and it should be subject to the Federal limit.

Jefferson, Lincoln, FDR, and Eisenhower proved that public investment can generate vast returns. The Federal budget should be a tool to encourage such national investment instead of writing it off.

Thank you very much, Mr. Chairman.

[The prepared statement of Ambassador Rohatyn can be found on page 65 of the appendix.]

The CHAIRMAN. Thank you very much, Mr. Rohatyn. Next, Dr. Michael Drake, who is the chancellor of the University of California at Irvine.

Oh, I apologize. We agreed to do an immediate round of questions for Mr. Rohatyn because he has to leave early, so let me begin.

It's important, because you've had a very distinguished career in the private sector as an investment banker, as well as your public sector work. One of the arguments we've heard is that the expansion of the public sector is somehow inimical to the private sector.

I do think it's important for you to comment from the perspective you've had as an extremely successful private financial markets individual as to the compatibility of the two and whether or not the

benefits you urge from an expanded public sector could in fact be done through the private sector instead.

Mr. ROHATYN. Well, Mr. Chairman, the experience that I've had in the public sector essentially was my work as chairman of the Municipal Assistance in New York. And that for me was an eye opener in terms of how bad the need is for the public and the private sector to work together. New York City would have gone bankrupt if we hadn't had access to public money, to government assistance. And we were able to do that by at the same time bringing the private sector, the banks, as well as the public sector unions, into the process.

And it turned out—probably turned out even better than we thought it might. But without it, the City would have gone bankrupt, the Nation would have suffered a terrible, terrible economic loss, and socially, it would have been a catastrophe.

So I am absolutely convinced that the public and the private sector have to work together, that they're complementary, and they're not at all in opposition to each other; that business and labor have to work together, and that political parties have to work together. If we don't do that, we are going to always be in trouble.

The CHAIRMAN. Thank you. A related question, because one of the arguments often made on the Floor of the House and elsewhere when we talk about government spending is there is a general view that less government spending is better, unless it's war or maybe going to Mars, or subsidizing agriculture. Those are the three exceptions that we often hear.

But there is a general view that if you cut government spending, that's better, and particularly we hear, when we're not talking about defense contracts, and this is a verbatim quote I have heard many, many times. Let me show off most of my Latin. I now quote you verbatim what I have heard ad nauseam.

[Laughter]

The CHAIRMAN. And it is that government cannot create jobs, that government spending cannot create jobs, that only the private sector creates jobs, and that government funding that is theoretically motivated by somehow increasing employment is almost a contradiction in terms. Would you comment on that?

Mr. ROHATYN. Well, my simplest comment is that public investment leads to private employment. Most of the people put to work by public investment are private sector employees, and most of the entities that benefit from public investment are private sector corporations. The notion that these are contradictory to each other doesn't make any sense to me.

The CHAIRMAN. In the book that you're working on, and the comments you've made, you talk about some major decisions involving significant public expenditure. Is it your view that private employment, private sector employment in the economy around those, subsequent to those events, was greater than it would have been if they hadn't been made?

Mr. ROHATYN. Oh, absolutely, Mr. Chairman. I mean, the decision by Lincoln, for instance, to finance the Transcontinental Railroad, if we hadn't had a Transcontinental Railroad, the economic development of this country would have been infinitely slower. To me, this is self-evident. The things that—

The CHAIRMAN. You hold that truth to be self-evident?

Mr. ROHATYN. I do indeed. I mean, the build-up to World War II, which was an extraordinary accomplishment both politically and economically, resulted in an enormous increase in private employment and private investment as Roosevelt was building the country up for World War II.

The CHAIRMAN. And I take it—I will turn it over to my colleague—but what it seems to me you were saying, what I read in here you're saying is that the job creation that results is not simply from the expenditure itself, which might sort of be self-evident in that sense, but enhances the creation for further private sector investment. That done well, public investment increases the level of private sector activity subsequently?

Mr. ROHATYN. Absolutely, Mr. Chairman. I would argue, if we did a better job in our public schools, we would have a much better functioning economy as a result. It may be 10 years later, but it starts right there.

The CHAIRMAN. The gentleman from Texas.

Mr. NEUGEBAUER. I thank the chairman. Mr. Chairman, I want to be clear. Are we just going to direct these particular questions to—

The CHAIRMAN. Just to Mr. Rohatyn, and then we'll do the rest.

Mr. NEUGEBAUER. I just wanted to be clear about that. Thank you, Ambassador, for—you know, I, number one, I concur with you that infrastructure is a vital part of our economy.

In fact, you know, one of the things I tell folks—and I'm a land developer, so I understand infrastructure probably as well as anybody, because I've put a lot of infrastructure in, and I look for infrastructure when I'm doing a land development project—I would say that you're right when you look at putting in the transportation infrastructure, for example, that we put in this country, opened up opportunities, bringing electricity to other parts of the country. And probably in those days, you know, there was no other financing source for some of those projects than the Federal Government.

But due to the sophistication of financial markets today, and the fact that we have the ability to put capital together, really for just about anything. I mean, we now have in Texas, under proposal, a private company to build a road and to build a toll road in our—do you see our role in the government is not necessarily—I noticed you're a proponent of going back to a 30-year bond or even a 50-year bond. One of the problems I had with that is, we have trouble up here getting a budget passed for a 1-year project, much less a 30- or 50-year project. But do you see the government being an augmenter of some of these marketplace activities now and letting the private sector fill in the gaps on this infrastructure?

Mr. ROHATYN. Sir, I believe, as I said, that there is a partnership always—usually a partnership role for the public sector and the private sector. I would give priority in terms of looking for capital to looking for capital in the private sector, even as we deal with public investment.

But I've also had experience, especially with the refinancing of the City of New York, with the fact that a relatively small amount of government involvement and public capital plays an enormous

role in encouraging the other players, the insurance companies, the unions, everybody else, to put in the majority of the capital.

Also, there are projects where the public purpose is more important than necessarily the profit margins of the business, which have to be put in equilibrium.

So my position would be that there has been a huge improvement in the technology of finance, if you will, and that can be put to use now in any number of private and public activities. And to make use of that as much as possible, but to have an instrument where if you have three governors who need to do a regional project that's complicated, and where the profitability isn't self-evident, to have a government financed entity that is professionally competent and then can put up enough of the money to encourage private sector people to come in.

Mr. NEUGEBAUER. Well, you're kind of leading to my next question, and want you just to expand on that. Where do you see the areas today where we don't see private capital coming to—showing much interest in infrastructure? Can you identify some of those areas for me?

Mr. ROHATYN. Well, I think that by and large, you can encourage private capital to look at investment practically anyplace. On the other hand, that is not always consistent with the profitability of the projects that would come about, because it just doesn't lend itself to that kind of thing. So I am for having all of the instruments that you need, both financial and nonfinancial.

For instance, you cannot—you're not going to put a private sector—at least I don't think, on a large scale, in the public school system of most cities in America today. You may do it in some places, but you're not going to do it on a massive scale.

So I think you have to do what works, and what works is some combination of private and public involvement, both in the financial and the operating area.

Mr. NEUGEBAUER. You know, in the education mode, I think the jury is still out on that, because, you know, it's a relatively new concept of—there are some very successful private institutions.

Mr. ROHATYN. Oh, I agree with you, sir. I just—

Mr. NEUGEBAUER. Yes. And so I think we have to be careful of characterizing that. I would say this. We have made a tremendous investment in education. People say we need to invest more in education and maybe that's true. But when you look at the money over the history of this country, of the amount of money that we have put into education, it's a pretty—if you graph it, it's a pretty steep graph.

And I think the question that people are—should be asking more is, instead of putting more money into education, I think what we are saying now is that we want more education for our money. I think that's particularly the road I'm going down, that before we continue to pour extremely large amounts of money into education, I think we have to go back and kind of look at the overall model and say, is this working? Because the money has been coming into education.

Mr. ROHATYN. I agree. I was actually mostly arguing about the need to build buildings where the water doesn't come through the roof onto these kids who are trying to learn the alphabet.

Mr. NEUGEBAUER. Thank you, Mr. Chairman.

The CHAIRMAN. I now recognize the gentlewoman from New York.

Mrs. MALONEY. Thank you, Mr. Chairman, for calling this important hearing, and it is a tremendous honor, Ambassador, to have you here today in Congress to share your knowledge with us, and I want to really personally thank you for your many contributions to our economy and really to helping our country, not only New York during the 1970's, and during our time of crisis, but you've continued to be a voice that everyone listens to.

And I have wanted to ask you this question for a long time, and even though it's a little bit off point, could you comment on the weak dollar and what that means to our economy now and your thoughts about the impact on our country long term with this? It appears to be a policy of the Administration to weaken the American dollar. And I would just welcome any of your analysis or thoughts on this subject.

Mr. ROHATYN. This is kind of a suicidal subject that you're asking me to comment on.

[Laughter]

Mr. ROHATYN. To some extent, the weak dollar is a result of our foreign deficits, and our foreign deficit is partly a result of the competitiveness of countries like China, India coming along, and our domestic deficits. So I think in today's world where the financial markets are so huge that it's very difficult to simply control them, that the weak dollar is a result of the economic position of our country in the world and our internal financial policies.

I'm not a fan of a weak currency in terms of its social repercussions and in terms of its standing in the world. So I would prefer, personally, a strong currency, economic growth, low inflation, and a relatively balanced budget, but I wouldn't make a fetish out of balancing the budget every year, mostly because I have no confidence in the accounting system of the government, which I don't think reflects at all the financial condition of the country.

So I'm not sure that's a very good answer that I'm giving you. I'm not sure there are very good answers to that question, frankly. But the weak currency is a result of a huge imbalance in our economic position, in our trade deficit as well as our Federal deficit, and the fact that countries like India and China are coming along like gangbusters and are going to make things very, very difficult.

Mrs. MALONEY. I heard a comment from Shirley Tillman, the president of Princeton, recently. She was asked what she thinks is the greatest crisis confronting our government. We feel that we're facing a crisis every day; there's something happening all the time. And I just would like to ask you the same question. Her response was the fact that our country is not investing in science and mathematics and really research and sort of cutting edge technologies, which has kept our country really on the curve, on the leadership curve in the world. And she saw the fact that we seem to be cutting back in—or we are cutting back in investments in science and technologies. And since we are—and mathematics. And since we are talking about public investments today and how it helps our economy, where do you think we as a Nation should be investing? Obviously, we need to invest in many areas, but if we had to be stra-

tegic, where do we need to put our dollars to help the most people and to really keep our country competitive in this very, very competitive world?

Mr. ROHATYN. Well, I would say education and infrastructure.

Mrs. MALONEY. You would say education and?

Mr. ROHATYN. Infrastructure.

Mrs. MALONEY. And infrastructure?

Mr. ROHATYN. Yes.

Mrs. MALONEY. Thank you.

The CHAIRMAN. The gentleman from Kansas.

Mr. MOORE OF KANSAS. Mr. Chairman, I want to welcome the witnesses who are here to testify today and thank them for their testimony.

I think Mrs. Maloney has asked some of the questions I would ask, and I would ask another question. Mr. Ambassador, if you don't feel comfortable answering, if you don't feel like this is in your area, please say so. I'm not trying to push at all. I'm just asking.

We have in this Nation an—

The CHAIRMAN. We may be one of the few committees in the Congress who is not subpoenaing people.

[Laughter]

The CHAIRMAN. So you're here voluntarily. You can answer or not.

Mr. MOORE OF KANSAS. Right. Right you are, Mr. Chairman. We have in this country an $8.8 trillion national debt. About 40 percent of that debt right now I understand is financed by foreign nations. And a question was asked, I believe by Mrs. Maloney, about our currency and our situation. Do you have concerns about foreign nations holding such a substantial portion of our debt? And what might be the result if those foreign nations decided they didn't want to hold our debt any more?

Mr. ROHATYN. I think, first of all, there is somebody from the Federal Reserve, thank God, on this committee, who can hopefully—

Mr. MOORE OF KANSAS. And I'm happy to have anybody if you care to answer it try to take stab at that. I'm trying to ask a legitimate question here. I'm not trying to put anybody—

Mr. ROHATYN. Totally. And it is obviously a risk to have this kind of imbalance in our accounts.

Mr. MOORE OF KANSAS. Yes, sir.

Mr. ROHATYN. And to have as much of our capital in hands that today are cooperative and tomorrow might not be. On the other hand, it does create a situation where we're all kind of in the same boat, and—

Mr. MOORE OF KANSAS. And what do you mean by that, sir? We're all in the same boat?

Mr. ROHATYN. Well, it will not help China to destroy the dollar.

Mr. MOORE OF KANSAS. Would their selling off our debt destroy the dollar?

Mr. ROHATYN. Well—

Mr. MOORE OF KANSAS. Or would it affect interest rates at all?

Mr. ROHATYN. It depends to whom and in what amounts and in what way. So I'm sorry not to be able to be very precise.

Mr. MOORE OF KANSAS. I understand.

Mr. ROHATYN. But this is a—first of all, it's a very delicate question.

Mr. MOORE OF KANSAS. Yes, sir.

Mr. ROHATYN. And secondly, it's something that I don't think anybody has the answer to. I think the only answer is to be as orderly in the way we run our economy and as prudent as we can be as to invest as much as we can in things aimed at economic growth and social support, and try to run our—both our import-exports and our internal budgets with as much equilibrium as possible. But that requires political decisions. This is not an issue that has no solution, if we want to do it.

Mr. MOORE OF KANSAS. Yes, sir. Well, I appreciate, and frankly agree with you, that as much as we can invest in infrastructure and education, that's going to be to the advantage of the people in our country. I think ultimately my concern is that our debt is getting so high and we sometimes end up borrowing money to make those investments, and I just—that's my concern of where do you find the appropriate balance? And if the gentleman from the Federal Reserve cares to comment, I'd be happy to hear anything you have to say. I know that since Chairman Greenspan has gone, everybody thought that the markets didn't listen to him any more. And when he talks about the possibility of a recession, I guess we were wrong that people, in fact, do still listen to Chairman Greenspan. Any comment at all, sir?

Mr. HAUGHWOUT. Well, Congressman, this is really not an area in which I specialize.

Mr. MOORE OF KANSAS. Okay.

Mr. HAUGHWOUT. I'm afraid I don't—

The CHAIRMAN. Yes. In fairness, he wasn't asked for this purpose.

Mr. MOORE OF KANSAS. Okay.

The CHAIRMAN. Will the gentleman yield to me briefly?

Mr. MOORE OF KANSAS. Absolutely, Mr. Chairman.

The CHAIRMAN. I appreciated the colloquy with the gentleman from Texas and Ambassador Rohatyn about the importance of education, and we talked about how much money has gone in there. In fact, I think if you look at education and measure by money, as we often do, as a value, we don't treat it very seriously.

We've just been through a markup with some amiable contention about CEO salaries, and we were told that those of us who thought that CEO salaries might have gotten a mite high were being mean-spirited, and we had to pay for performance. Look at what we pay teachers. If you look in this society at the salary of teachers—let me put it this way. If you didn't know what the occupation was, and you just ranked compensation, and then you said based on the amount of compensation, how strongly do you think the society values that profession, you'd figure teaching wasn't very highly regarded around here. We don't pay teachers very much at all.

So when you look at overall expenditures, there are a lot of things that go into it, but I believe it is in fact a sign that we have not as a society valued education when we pay the people who are trying to teach 5-, 6-, or 7-year-olds, particularly those who have

had difficult lives previously. So, yes, I do think that that's a good measure.

Now, money can be well spent or badly spent. But if you start out by substantially undercompensating people compared to so many other professions in this society, we shouldn't be surprised. And I'm just off on this tangent, but we used to be able to get away with that because we had a good thing to help us get teachers even though we underpaid them. It was called sex discrimination.

If you were a woman interested in chemistry or physics or biology 40 years ago, you could go be a teacher or a nurse. And as the society has made some progress in diminishing discrimination, women have other options. So, you know, we had an artificial supply of good teachers because of sex discrimination, and that artificial supply is no longer there. Supply and demand, I think, have not yet rebalanced.

I appreciate the indulgence. The gentleman from Texas.

Mr. GREEN. Thank you, Mr. Chairman. And I thank all of the persons who are appearing today, as well as the ranking member. Just a comment before I ask a question, and it has to do with education as well. We from time to time hear of problems in police departments, corruption, if you will. And rarely do we talk about eliminating police departments or police services. We usually will conclude that we should fix the problem. We should hire more police officers, pay them more, and buy better equipment. We should do those things necessary to maintain what we know to be a good system.

And unfortunately, I agree with what the chairman has said, we have not taken a similar attitude, I think, as it relates to education. We want to leave no child behind, but in the process, we seem to overlook the fact that we have to leave no teacher behind if we're going to leave no child behind. And I want to associate myself with the comments of the chairman on education.

Mr. Ambassador, I hate to be the one to ask you to go into specifics. You mentioned education in the main, but what aspect of education would you conclude that we should focus on? Should it be Head Start, higher ed? Where should we go in your opinion, with our public influence by way of emolument?

Mr. ROHATYN. Sir, I am not an expert on education, and, therefore, I will give just an off-the-cuff answer, if I may. My wife is involved—and I should have brought her here. It would have been much more productive.

There are two areas of education that to me seem vital. One is to start very early, not to wait for a child to be 5-, or 6-, or 7 years old to begin concentrating on what to do. And secondly, as I mentioned earlier, to give working facilities to children in schools a clean and safe environment. And in working at MAC in the city, I got involved in this subject, because we created a building fund for the schools as we were starting to run surpluses. So I spent a lot of time walking around the schools. And it is the most distressing and depressing situation in most of the schools that you can think of. And I think that unless you start children very young in a decent environment to study in, it's hopeless before you start.

But, you know, the rest is how you—what the curriculum should be, and how this should be organized. I'm not an expert on that.

Mr. GREEN. Thank you. Mr. Chairman, I will yield back the balance of my time in the interest of time.

The CHAIRMAN. I thank the gentleman. The gentleman from California.

Mr. CAMPBELL. No questions.

The CHAIRMAN. I thank the gentleman. The gentleman from Missouri.

Mr. CLEAVER. Thank you, Mr. Chairman. I really appreciate your comments, Mr. Ambassador, with regard to public financing. Here's a conundrum. I think we should invest in public financing for the same reason that you stated, and I've seen it in my City. I'm a former mayor of Kansas City, Missouri, and I've seen public investment generate all kinds of private economic development around the public investment.

The problem is—and it's been touched on by my colleague from Kansas, I think everybody here to some degree—we are borrowing so much money that, frankly, we're financing everything with borrowed money. We are a debtor nation. And $7 billion for Katrina in the supplemental that we approved earlier today. And so there's a public investment going into New Orleans. And when you think about the infrastructure declining on the Federal highways and in the cities. Most cities on the Eastern seaboard are functioning with stormwater and sanitary sewers that are over a century old, and they're crumbling. But if we try to do public investment, you know, some kind of a contemporary TVA, we're going to have to borrow money to do it.

Now the only other option is to figure out how to reverse the trend toward a minus zero savings rate in this country. We have to borrow from foreigners because we don't have—we don't save money in this country, whereas in Asian countries, the savings rate in some rise above 20 percent, and we are like 0.6 or something. I'm not sure exactly what it is right now. What can we do, or is there anything that we can do, that you would suggest, to generate a savings rate? Or is it that the economy is not as good as we are being told it is, and people cannot save, and, therefore, they are spending all they earn and then borrowing to make it?

Mr. ROHATYN. Well, sir, I hate to bring up something that is probably considered impolite in this City, but I would just—

Mr. GREEN. Nothing is impolite in this City.

Mr. ROHATYN.—refer to the fact that no other country in history has ever gone to war and cut taxes at the same time. And when you start with contradictions of interest that are so profound, I don't know what to say to you with respect to ultimately running a balanced economy that deals with these things, because you're eliminating revenues to an extent that it's finally impossible.

So, most of the problems that this country has, I think, because we are still the strongest economy in the world. We have great science. Every other year we invent something new like Google or Yahoo or things that 5 years ago just didn't exist. But we can't seem to agree among ourselves on a balance between spending and saving. So, these are not rocket science, but they do require some unity of interest and some unity of philosophy in terms of what kind of an economy and what kind of a society you want to run.

Mr. GREEN. I have a question. Have you seen this TV commercial where this guy starts out walking from his home and he says I have this beautiful home and great family, then he's driving around and cutting his grass on a tractor, and the next thing he's cleaning his swimming pool. They have a gorgeous swimming pool. And he says, "How do I do it? I'm up to my eyeballs in debt." And every time I see that, I just—I think about our country, our Federal Government.

Thank you.

The CHAIRMAN. Thank you. Thank you, Mr. Rohatyn. You're excused now, and I appreciate your coming to see us.

Mr. ROHATYN. Me, too, and I apologize.

The CHAIRMAN. No, no, we changed this around. I'm very grateful to the others for staying here, and I'm sorry that we don't have control over the schedule, and we are indebted to you for your indulgence.

We'll now resume the statements. Dr. Michael Drake is the chancellor of the University of California, Irvine. And I guess the closer people were, maybe then they can go early, and then get home. You're stuck for the night. So, thank you for staying. Go ahead, Dr. Drake.

**MICHAEL DRAKE, M.D., CHANCELLOR, UNIVERSITY OF CALIFORNIA, IRVINE**

Dr. DRAKE. So I'll talk low and talk slow and I won't say too much.

The CHAIRMAN. Two out of three won't be bad, Doctor.

Dr. DRAKE. Okay. Good afternoon, Chairman Frank, Ranking Member Bachus, and committee members. Thank you for the opportunity to appear before you today to discuss the important issue of Federal investment in basic science research.

I am Michael Drake, chancellor of the University of California Irvine, one of the 10 campuses of the University of California system. At UC Irvine, we educate nearly 26,000 students and conduct research in a wide range of the sciences, supported by the National Institutes of Health, the National Science Foundation, the Departments of Defense and Energy, NASA, NOAA, and several other Federal research agencies.

Our Nation's system of higher education, and particularly its public universities, are a unique example of a public investment that has paid enormous dividends. Starting with the GI Bill, Federal student aid has helped shape postsecondary education since World War II. Thanks to the Federal Government's commitment, including your recent action to increase the Pell Grants, students with need have increased access to higher education.

America's colleges and universities produce human and intellectual capital, the twin engines of economic growth. Public investment is the critical factor that has made our research universities the envy of the world. There is no doubt that university research is critical to our Nation's R&D enterprise. Universities perform over 60 percent of the Nation's basic research.

Economists attribute as much as 50 percent of our national economic growth over the last half century to innovation. To quote Alan Greenspan in 2001, "Had the innovations of the recent dec-

ade, especially in information technologies, not come to fruition, productivity growth during the past 5 to 7 years, arguably, would have continued to languish at the rate of the preceding 20 years."

Public investment in basic research has an added benefit—the integration of research and education. At both the undergraduate and graduate levels, students learn by doing, both in the lab and in the classroom. Research takes place in the institutions that develop our young future scientists. Other countries, particularly China and India, are struggling to emulate this. As you well know, Mr. Chairman, from your personal experience, it is that formula that spawned the root 128 phenomena in Massachusetts, as well as the Silicon Valley phenomenon in my own home State of California.

Our country's higher education system is so successful that we often forget how big a role federally supported university research has played in changing Americans' lives. For example, in my field of medicine, for the second consecutive year, annual cancer deaths in the United States have actually fallen. This drop, a first in history, is occurring despite the aging of our population.

On the physical sciences side, basic research in physics led to the development of the Global Positioning System, which has been an invaluable aid to our military, and also to wayward travelers, I should add. Imagine as you leave here what you will do and be impacted with; dozens of things that were unthinkable a generation ago, whether it be listening to an MP3 player, using the Internet, or using your ATM card. I mention a number of other examples in my written testimony.

The Federal familiar in basic research has had an excellent return for American taxpayers. It has been estimated at between 28 to 40 percent per year. But why does the Federal Government have to do this? Why shouldn't the private sector do more? Well, the fact is that business spends an enormous amount of money on development, but the characteristics of basic research are not attractive to short-term investors. Basic research is just that; basic. It is long-term and uncertain. It is a fundamental building block for the future. Basic research doesn't conform to the investor cycle of quarterly reports. Norm Augustine, the former CEO of Lockheed Martin, frequently tells how his company proudly announced a program of long-term investment in basic research, only to watch its stock price fall.

With few exceptions, my State of California being one, States simply lack the means to invest heavily in research. State support is a very small portion of the total basic research done at our universities. But the Federal commitment to basic research has had a mixed record in recent years. It is true that Congress recently doubled funding for the NIH, and thank you. But since 2003, NIH funding has declined in real terms by 12 percent. Physical sciences and engineering research have been nearly flat funded over some 3 decades. Given the growing importance of interdisciplinary research, adequate funding for both the life sciences and the physical sciences is essential.

I am here today as the chancellor of a research university, but I am also a physician and an NIH-funded researcher for over a quarter century. I marvel at how diagnostic tools, therapies and

preventive knowledge have transformed the practice of medicine and enhanced the quality of life for all Americans.

Mr. Chairman, I want to thank you and your colleagues for the recent actions taken by this Congress in its funding decisions this year. I respectfully request that the Congress continue its support for research. Only the Federal Government has the resources and ability to support this vital research. We can afford these investments. Indeed, we must make them if we want to continue to lead the world.

I thank this committee for bringing the Nation's attention to this incredibly successful partnership and hope it will continue to spread the message through the Congress and the Administration. I'd be pleased to answer your questions.

[The prepared statement of Dr. Drake can be found on page 32 of the appendix.]

The CHAIRMAN. Thank you. Our next witness is Mr. Miles Rapoport, who is the president of Demos. And I should have said before, any written material that any of the witnesses wish to insert in the record, without objection, will be inserted. Go ahead.

**STATEMENT OF MILES S. RAPOPORT, PRESIDENT, DEMOS**

Mr. RAPOPORT. Thank you. I deeply appreciate the opportunity to be here, and I thank the committee for turning its attention to this important issue. To introduce myself briefly, I am the president of Demos, a network of ideas and action. Demos is a nonpartisan public policy and research institute founded in 2000. We focus on problems of democratic participation, economic opportunity, and the important question you are considering today, the proper role of government in our society and the economy.

In the 1980's and 1990's, I was in State government in Connecticut, both as secretary of the State, and also for 10 years in the legislature where I was a member of the Finance Committee. The role of public investment was central to all that experience. I was a freshman legislator in Connecticut when the Mianus River Bridge in Greenwich collapsed after years of deferred maintenance. I was there for an ambitious initiative called U Conn 2000, which spent 10 years investing in the University of Connecticut with fabulous results. And 10 years ago, the City of Hartford received a significant state of investment, which has had an enormous important and salutary effect on that City and its economic vitality.

These cases were my education, both in what happens when we underinvest in our infrastructure and the public structures that undergird our economy and quality of life, and they were my education in the leading and positive role that public investment can play in economic development.

I believe it is important to restore a broad understanding of the role played by public investment and the public sector in our economy and in the quality of our lives. America's signal achievement after World War II, the creation of a broad and vibrant middle class, was accomplished with policies that included major public investments. The Veterans Administration and the FHA helped millions of young families buy homes. The GI Bill, and later the Pell Grants and Stafford loans, helped millions of young people get an education. These public investments created opportunities for

young people—young families, rather—to get a leg up and build a future for themselves and their children.

Unfortunately, this commitment to investing in shared prosperity has waned. Over the past 30 years, public investment has been systematically devalued. There has been a sustained and relentless critique not only of government's excesses but of government itself. The ideals of the marketplace have been elevated and extended into arenas previously occupied by an understanding of a shared common good.

In the 1970's and 1980's, we embraced privatization, deregulation, and the liberation of the global marketplace. It all boiled down to one simple message: the market is better. This has left Americans with a very negative view of government. Careful research undertaken for Demos over the last 2 years shows that people have two dominant images of government, both negative. The first is of politicians fighting and attacking one another, and the second is of an ill-defined, bureaucratic monolith that has little to do with people's daily lives. Most people give little conscious thought to the number of ways in which every day, government, properly run, assists us all. And it is a very long list.

The consequences of devaluating public investment have been severe. Let me mention a few. The first is inequality, which has increased dramatically in America over the last 30 years. The rewards of private investment have gone to a small or smaller number of people who have pulled far ahead of the rest of us. It is by now a familiar tale. The top 10 percent of Americans have increased their share of personal income from about 30 percent in the postwar era to 46 percent in 2004. The share of income going to the bottom 60 percent has plunged from 32 percent in 1967 to 26 percent in 2005. Is this connected to the lack of public investment? I believe that it is.

The second consequence is the highly disturbing fact that for the first time in recent American history, the next generation will not, as a whole, be better off than the previous one. Tamara Draut of Demos, in her book, *Strapped,* makes it very clear that in comparing young Americans today to my generation, it has become far more difficult to achieve the hallmarks of middle-class adulthood: getting a college degree and paying off your debts; buying a home; having children; and getting a job with health insurance. In each of these areas, our investments have declined significantly.

Third, there are areas of our economic life where government can not only achieve economic goals more equitably than private markets, but more efficiently as well. Health care is probably the clearest case. Public Medicare is far more efficient than its private counterparts. The VA hospital system does a better and more cost-effective job than its fragmented private sector counterparts. But thus far, our market-oriented blinders have kept us from seeing this clearly.

Let me mention just three specific realms in which I think public investment could make a major difference. The first is investment in early childhood education, particularly programs for children born into disadvantaged circumstances. The work of Nobel Prize winning economist James Heckman shows that investment in early childhood programs gives children a much larger chance to succeed.

From a strictly income-generating viewpoint alone, according to Heckman, such programs can increase earnings by 15 to 17 percent over a lifetime.

Another arena for investment is to make college more affordable. Education is a requirement for people to succeed in the workforce, and for our economy to compete in the global arena. But many students are either avoiding post-high school education altogether, or graduating with enormously burdensome levels of college-related debt. According to recent studies, 168,000 academically qualified high school students every year don't attend college because they can't afford it, and a large number attend 2-year colleges rather than 4-year colleges for the same reason.

The Pell Grant, which used to cover three-quarters of the cost of attending public universities, now covers only a little more than a third. Grants have largely been converted to loans, and tuition in our public 4-year universities has more than doubled.

A last arena—and this is a very personal experience for me—is making a needed public investment in our democracy itself. Elections in this country have literally been run on a shoestring, and we have paid a heavy price and lost confidence in our election system. The patchwork of laws, rulings, and equipment purchasing decisions, has all of us on edge about procedural chaos every time a major election comes up. We need a strong national agency with serious and sustained investment in research, testing, standard-setting, training, and enforcement, and we need sustained support for States in improving their system.

Let me conclude by saying that our Nation's future and that of its people depends on a set of public structures that give everyone, businesses and individuals alike, the chance for success. These structures, whether they are scientific research programs, as the chancellor said, levies, bridges, roads, colleges, or children's programs, promote the common good and shape our common future. We need to reverse the undervaluing of public investment and our government's overall role. This committee's hearing today is an important contribution to that conversation. I thank you for allowing me to be part of it.

[The prepared statement of Mr. Rapoport can be found on page 55 of the appendix.]

The CHAIRMAN. Next is Mr. Clifford Winston, who is a senior fellow of economic studies at the Brookings Institution.

**STATEMENT OF CLIFFORD WINSTON, SENIOR FELLOW, THE BROOKINGS INSTITUTION, WASHINGTON, D.C.**

Mr. WINSTON. Thank you, Mr. Chairman, and members of the committee. I'm happy to be here to talk about public investment. Public investment encompasses both investment in physical infrastructure and investment in human capital. I'll confine my remarks to investment in physical infrastructure or physical capital, but a lot of what I have to say, I think, also applies to investments in human capital.

Any economic intervention in a market calls into question how the markets are doing. This is not necessarily an attack, a general attack on markets, but one has to ask the question, why is government involved in public investment? So the first thing I want to

talk about briefly is just some justification for what I call public production. That's what we're dealing here with, physical capital. Then I'll assess how government policy has performed in this task, and then I'll briefly conclude with some policy suggestions.

All right. Justification. The main justification for economic involvement in public production is market failure. That is, there is the view that the market would not provide a good or service that is socially desirable even though it's privately unprofitable. For example, roads. The roads system is extremely expensive to construct. It would be extremely expensive and difficult for the private sector to raise all the capital to build the interstate. Even if they could raise the capital, they'd be encumbered by such great debt that they'd probably never make a profit.

Or, for example, an urban rail system. It may not be that they're going to be able to attract sufficient demand, or with competition from autos get higher fares to support a private sector rail system that's profitable. But these things could be socially desirable in terms of the benefits to the public exceed the subsidies that are required to keep them going.

So, if the public is involved then in doing this, and we see this in a number of areas, certainly in the transportation infrastructure—highways, airports, inland waterway systems, public investment involved there—public land management—and then services—urban bus, urban rail, and inner city rail service, that is Amtrak, Postal Service the like—all areas of public investment. The question is, how well has the government done? Has it performed efficiently? This is not a question of whether these things are desirable. Presumably they are. The question is, are they being provided in an efficient way?

My assessment will be drawn from my book. The book is entitled *Government Failure Versus Market Failure.* It's actually available for free on my Web site. Don't tell Brookings I've said that if you want to see it, but it is on my Web site. What the book is about broadly is retrospective assessments by the economics profession about what we really know about how government has performed in this area. Some of the work I've done, obviously, or I probably wouldn't have written the book, but mainly the work is done by a lot of other economists.

The general lesson you get out of the work is that research accumulates. We don't start from square one. We now have really a core of knowledge that we can build on to get to, "truth"; that is, at least the state of knowledge we have at the time, and this could be quite powerful, I think, in our understanding.

Let me begin before getting to that evidence with just some descriptive statistics to get some intuition. You observe growth in highway congestion and delays, something probably all of you live with, you see that. Growth in air travel delays. You certainly hear about that. Growth in urban transit deficits. You probably hear about that, or certainly the issue of the Dulles extension costing $4 billion raises questions and obviously, you're all aware of the big dig, that costing a little bit more than we planned on it costing.

So that suggests that public investment might be characterized by serious inefficiencies. It need not be. These things may be just the price of getting socially desirable goods and services. However,

the academic evidence that I mentioned actually does reinforce intuition that in fact there have been tremendous inefficiencies in all these areas that have cost of hundreds of billions of dollars and are a drag on economic growth.

There are a number of sources for where the problems lie, but I'll just touch on two—inefficient pricing and inefficient investment. Quick examples. The problem with pricing like in the area of highways. Highways are underpriced in the sense that the users who contribute to congestion don't have to pay for that congestion, so there is demand for capacity but people do not have to pay for that. And that's a wrong signal for investment. We think we need more roads, but if we price them efficiently, perhaps we wouldn't.

Trucks. Trucks tear up the roads because they're big and heavy and all that, but the damage is related to the weight per axle. That is, if you have more axles, that is good, that helps your weight and you do less damage. It displaces your weight. You do less damage to the road. However, the way we price roads is with a gas tax, which is perverse. It penalizes trucks who do the least damage, because they're the ones with more axles, but they get less fuel economy, okay. But this is exactly the kinds of ways that we are allocating resources in roads.

Road investment. Pavements. They should be trading off up-front capital costs for ongoing maintenance costs. A thick road doesn't have to be maintained as much. What's happening is, we underbuild roads, they're maintained a lot. They don't last as long, and we wind up increasing expenditures, okay. These are some of many examples that I could talk about just in terms of specific policies that have led to serious inefficiencies in public production and public provision of infrastructure. As noted, the implication is, a lot of waste and resources, as I said, hundreds of billions of dollars a year; a drag on economic growth, so you actually see the return on investment in these areas is low. I've estimated that one dollar of spending on highways reduces congestion costs only 11 cents. So I guess I'm suspicious of claims that we should increase spending. Why do we want to increase spending when we're getting such low rates of return? Usually, that's not where you want to be putting your resources.

Where then do I see policy? First, you look at what the source of the problem is. A lot of this, obviously, deals with political economy, and you could actually give better testimony than I could about the pressures to lead to waste in spending, also rigidity of agencies. The real concern, regardless of what you think, the story is these inefficiencies has persisted for decades, and there are real concerns about seeing reform, but growing interest in when the private sector could do better.

So here is where I think we now have to have a broader vision, not just public-private partnerships, but serious consideration of the, "counter factual," that is, privatization.

We could, in all these areas of the private sector, do better. I think it would be premature to recommend this, but the success of deregulation, not only as a policy, but getting bipartisan support, was through experiments, that is without knowledge of what intrastate airline competition was doing, lower fares compared with interstate, without knowledge of deregulated commodities, how

they compared to the price of regulated commodities, I do not think Congress will be enthusiastic about deregulation.

What I am calling for is growing interest in experiments of privatization, in a variety of areas. Obviously, I do not have enough time to go into how this could be done. I think there is a lot more thought that goes into it.

I would suggest that such experiments might reveal ways that the private sector can help in far greater ways than we could possibly imagine, and transform a lot of our infrastructure in urban services in ways that we could not imagine just as how deregulation has transformed our inner city system and generated such high benefits.

Thank you.

[The prepared statement of Mr. Winston can be found on page 73 of the appendix.]

The CHAIRMAN. Thank you.

Our final witness, and then we will have questions, is Mr. Andrew Haughwout, who is a member of the Research and Statistics Group of the Federal Reserve Bank of New York.

Mr. Haughwout?

**STATEMENT OF ANDREW F. HAUGHWOUT, RESEARCH AND STATISTICS GROUP, FEDERAL RESERVE BANK OF NEW YORK**

Mr. HAUGHWOUT. Chairman Frank, and members of the committee, thank you very much for the opportunity to speak to you on the subject of public investment.

Today, I will be discussing research on public investment and its relationship to economic growth and wellbeing.

All of the views I will express are my own and are not those of the Federal Reserve Bank of New York or the Federal Reserve System.

Physical public capital, what I will refer to as, "infrastructure," is the dominant component of the Nation's publicly owned wealth, and it is that kind of investment that my own research is focused on.

Infrastructure consists largely of highways and streets, buildings like schools and city halls, and sewer and water systems.

Public capital is a very important part of the Nation's wealth. Public investment in physical capital was over $430 billion in 2006, adding to a stock of publicly owned physical capital that would have cost nearly $8 trillion to replace in 2005.

About 90 percent of the non-defense public assets in the United States are owned by State and local governments. Nonetheless, the Federal Government plays a large role by helping to finance the construction of capital goods that State and local governments own.

The ultimate goal of the large amount of resources devoted to public investment is improvement of the welfare of the American people.

Today, I will discuss three crucial issues surrounding public infrastructure: its effects on economic growth; its effects on household quality of life; and how these benefits are influenced by the way we finance and locate new investments.

The first issue is the relationship between infrastructure and economic growth. Well-functioning infrastructure systems are crit-

ical to a well-functioning economy, but it is clear that the United States already has extensive public infrastructure.

The evidence we currently have points to a conclusion that additional infrastructure investments do increase productivity but those effects are probably smaller than the benefits of private capital.

Early estimates from the 1980's had indicated that infrastructure's contribution to private output was approximately twice as large as that of private capital, which led to concerns of a severe infrastructure shortfall.

More recent research has resulted in significantly lower estimates of the productivity of infrastructure, and most economists now agree that the earlier estimates were too high.

The second central issue, which has received far less attention from economists, is the direct benefits that infrastructure provides to households. An example may clarify what I mean.

Imagine that a State builds a new road from your home to your place of work that cuts your one way commuting time by 15 minutes. Will you arrive earlier at work each day or sleep later?

The way economists have thought about infrastructure implies that all employees will get to work earlier, increasing the output they produce. At least some workers will probably sleep later or read the paper longer each morning. This increased leisure will not be accurately measured in standard studies of income or productivity, but it is still a real benefit since it improves quality of life.

These quality-of-life benefits of public investments have been less well studied, but some evidence is available. In my own work, I have estimated that the value to households of increases in infrastructure is considerably higher than the comparable benefit to firms.

The issue of infrastructure's effect on wellbeing is broader than its effect on income.

The third issue I would like to emphasize is that the way we finance and select infrastructure projects affects location patterns. This dimension is important since where activities occur has significant effects on levels of productivity and income growth.

Thus, an important way in which infrastructure policy can potentially affect economic growth is through its effect on location patterns.

Research indicates that private firms in dense urban environments are more productive than in less developed areas. Because they are often placed in relatively undeveloped areas, public investments provide individual firms and households with incentives to move from more to less dense environments, but if this re-distribution of activity reduces productivity growth, then the placement of new infrastructure in relatively undeveloped areas may not be the most effective use of public monies.

The complex way we finance public investments allows localities to receive the benefits of public works, while much of the cost is paid by taxpayers elsewhere.

Regional decisionmaking bodies are authorized to allocate transportation investment budgets, but do not typically control the size of these budgets.

Maximizing the effectiveness of our public investment budget requires careful attention to both the level of funding and the design of institutions for allocating infrastructure investments.

Thank you.

[The prepared statement of Mr. Haughwout can be found on page 45 of the appendix.]

The CHAIRMAN. Thank you all, very much.

It is 3:00 on a Friday afternoon. We are through with votes. There are five members here and a couple of others in and out. There is some interest in this, and we intend to continue to discuss it.

Mr. Winston, to get a sense of this, you talk on pages two and three about transit pricing—three and four. You talk about how it is below what is needed.

Would you recommend raising the fares for public transit? You say it would be privatized. Would a private company doing the transit then raise the fares?

Mr. WINSTON. Let me step back.

The CHAIRMAN. No, please do not step back. We do not have time. That is the question.

Mr. WINSTON. Ultimately, yes. My expectation would be that the subsidies are something that would not be sustained in a private system.

The CHAIRMAN. You would advocate turning it over to a private company which would raise the fares?

Mr. WINSTON. I would advocate a private company to do two things. First, try to minimize the cost of service. That is a critical part. My expectation, even with a lower cost of service, is that fares would probably be higher; yes.

The CHAIRMAN. Thank you.

Dr. Drake, one of the things that concerns me is that we are told by some—Alan Greenspan, Ben Bernanke—that yes, we have more inequality than it is healthy for society to have, and they have argued, and others have argued, that the major way to diminish it, never to try to even come close to abolishing it, is through education.

I believe they are putting too much of a burden on education going forward, and certainly education does not take care of all the people who are already in their 30's and 40's, but even if we are talking about education going forward, my view is that part of the problem is if you simultaneously are an advocate for steady reduction in government spending kind of across the board, you are going to have problems. A critical element in the education is going to have to come from public funding. What is the state of the current level of Federal and State funding for education?

Can the private sector make up for it? Do you think we need more public support for education, particularly higher education?

Dr. DRAKE. A complicated question, and I think a challenging one. I believe that Federal support for public education is a critical factor that has made this country what it is.

I speak from the higher education point of view first, and say that if we look at the United States in the last half of the 20th century, compared to the United States in its history before that time, things that made us a leader among nations were things that came

from our higher education compact, and things that we brought to society from the education system, and a lot of the growth over this last several decades has been the result of Federal investment of research and other things that have come from higher education.

I would say at the same time, from the time I grew up going to public schools, that the level of investment and the level of quality in public schools across the country is just very different than it seemed like it was when I was attending.

The CHAIRMAN. When I talk about, "public," I am talking about public support for higher education. That is what concerns me.

What is the current projection—I agree with you that higher education has been important. From the standpoint of diminishing, reducing inequality, it seems to me that there is going to need to be a public funding element of higher education.

What is the state of that today? In terms of the accessibility of people from poor families, lower income families, what kind of access do they have to your institution?

Dr. DRAKE. We at the University of California actually have a very proud record of access to lower income families, about a third of our students, 30 percent of our students, are PELL grant eligible, which is the highest of any comparable institution in the country. We are very proud of that.

I will say that every year there is increasing stress on families to be able to support their students in our education system. As fees go up, the stretch and strain on families, particularly middle income families, becomes an increasingly large burden.

We work quite hard to try to do everything we can to keep costs as low as possible while maintaining the excellence that is required to be leaders nationally.

I will say that State support is the way that we would see it most actively. From the time I was a medical student at the University of California, San Francisco, now 30 years ago, the percentage of State support has dropped to about half of what it was before. I think that is troublesome.

The CHAIRMAN. That is very troubling. State universities in general say that well, the trend has been much lower. I just wish when people talk across the board for lower public expenditures, they will understand that among the expenditures that have been lowered is support for higher education.

My time has expired. The gentleman from Texas.

Mr. NEUGEBAUER. Thank you, Mr. Chairman. I will say this has been a great panel.

Dr. Drake, I want to go back to something that you said that I agree with. The country has been an enormous benefactor of the research that has gone on in many of our universities in the technology. You pointed out the GPS, and that is not only something we enjoy in the military.

As a policymaker, one of the things we face is something that you were kind of alluding to, we have this huge appetite from our research universities that if you will give us more money, we can do more research, and in fact, provide a better educational opportunity for our students who are coming there.

Then the other piece of it is that we hear more and more of our students are having trouble at the other end of the spectrum, of becoming a student.

What are some things that you think we can do at our level to do that? Either we are going to be giving you folks more money for research or we are going to be helping more students get into the system. Somewhere in the middle, I guess, is the appropriate balance. I do not know that we have found that yet.

Dr. DRAKE. Yes. I was going to say both, but I guess it was not one of my options.

Mr. NEUGEBAUER. Everybody who comes up here, that is their answer. We are looking for some solutions here.

Dr. DRAKE. I understand. I would say a couple of things. One, I am here to support research. I think supporting students is also critically important, and there really is a balance. We do what we can actually, and in a lot of our research, we do educational research also, to look at how we can help to improve the educational system.

In fact, in California, we have recently started a new initiative at the University of California to go and do something called the Science and Math Initiative, where people from our campuses work in K–12 to try to help the production of K–12 individuals be stronger in the science and math areas particularly, those things that are important for technology as it goes forward.

It is a critically important balance. I think you often have the challenge—I do not mean to make the analogy, but as a chancellor, all day I have people coming to me with good things that they would like for me to do, and then more good things than we can do, and there is a balance between those two.

As a country, we have done very, very well over these last several decades in that balance. I think it is important to stay the course.

Mr. NEUGEBAUER. Thank you.

Mr. Winston, I was listening to your discussions about infrastructure and to the extent of letting the market forces be much a part of that as you can, and I agree with that.

One of the interesting concepts that I have been toying with as a former city council member and then later working on a transportation project, is a concept of buying down.

Do you know what to buy down a mortgage is? To pay fees up front to make the interest rate less on a mortgage, so you pay some up front.

One of the things I have been a proponent of is letting the public sector buy some of that down to an economic level and where it makes sense for then the private sector to be able to take that. That leverages those dollars.

Let's just say we could build a road for $1 million, using all public money. Dr. Drake here needs money for education and those kinds of things.

If we could put, say, $100,000 of public money into that transportation system and let the private sector put the other $900,000 in, and let the private sector maintain that road and keep it up from that point forward, that frees up my $900,000 for education and schools and research and other kinds of things.

That creates an interesting debate. There are a lot of laws against mixing private and public money and taxpayers' money together.

What are your thoughts on that concept?

Mr. WINSTON. My concern about that is that although you can sort of name, in your example, hard fees, $100,000 versus $900,000, in practice, once we go down a road like that, there is the risk that the $100,000 is not enough, that the private sector is involved.

We sort of got a sense of this in private investment possibly in a high speed rail, inner city rail, there were supposed to be projects that were going to go in that way, but the private sector initially was interested, and then after making further inquiry into what it was going to cost, they came back and said, "No, we are going to need more money."

If we could really agree there were going to be limits and that these limits we could identify were sort of the tipping point that would be just what the private sector needed to attract them, that would be great.

I think as a practical matter, the system could be gamed, and once they get in, there can be problems.

I am weary about that. I am also weary about the incentives for the most important thing that I am really looking for in this area, which is innovation.

When the private sector fully has a stake in these systems, then they start to think out of the box and start making the kinds of technological changes and innovations that are unencumbered by the public sector, and that often can give you the sort of biggest return, the things you just cannot anticipate and you cannot see.

Unfortunately, I cannot say that I am enthusiastic about those kinds of arrangements.

Mr. NEUGEBAUER. Thank you.

Mr. GREEN. [presiding] The gentleman's time has expired. I will now yield myself 5 minutes.

If I may, I would like to visit with you, Mr. Rapoport. I would like to go to page six of your codified instrument.

On page six, near the very bottom of the page, the language reads, "Public Medicare is enormously more efficient than its private counterparts, with far fewer administrative costs.

"The VA hospital system, with its efficiencies of scale, long-standing patient relationships, and comprehensive care, does a better and more cost effective job than its fragmented private sector counterparts.

"But in the health care debate thus far, our market oriented blinders have kept us from learning these lessons."

What I would like to know is, and this may not be the best time to talk about the VA system, given some of the things we have heard in the news lately, please, if you would, tell us what we can learn from this in terms of health care for people in the main.

Mr. RAPOPORT. The most recent information that I drew from in talking about the VA was a very interesting piece from the Boston Globe by Drake Bennett on March 11th, which sort of looked very closely at what the actual cost and quality implications were of the

VA, which obviously as you know, does not impact running the Walter Reed Hospital, it is a separate system.

And what they found is because there was such a long term clientele, if you will, that is people who use the VA system as their main source of health care, that there was an up front investment in the proper testing and the proper long term care that they got, which actually lowered the costs of medical care, gave them very, very good care, had a very high satisfaction rate, and a relatively low administrative cost, as opposed to in the privatized system where patients are going from one place to another to another to another, and often not as properly coordinated.

The administrative costs were low and the quality of care was actually quite good. It sort of came as a surprise to the writer of the article as he investigated it, but that is what he came back with.

Mr. GREEN. How would you respond to the notion of some sort of nationwide health plan that covers everyone that has government involvement?

Mr. RAPOPORT. This is somewhat out of my area of full expertise. I would generally say that as an area of needed public investment, creating a health care system where we have universal coverage for everyone with administrative costs that are kept under control would be an extraordinarily important investment for the health, wellbeing, and ultimate productivity of society.

Almost every other industrialized country that our businesses compete with pay for the health care of their citizens in one holistic system as opposed to putting the burden onto the corporations or putting it onto the individual.

I think that would be a very productive way to do it. By the way, one very easy way to think about this would be to expand Medicare to a different age population. It has fairly low administrative costs, and I think that would be a good step forward.

Yes, I think as a matter of an area for public investment that would pay very high returns, I happen to believe that would be a good one.

Mr. GREEN. Would anyone else care to comment?

Dr. DRAKE. I should. This has been my field. I am also chair of a group now called the Association of Academic Health Centers for the United States, where we look at this very carefully.

It would be incredibly helpful for the efficiency of the health care system in this country and for the health of our citizens.

Mr. GREEN. Thank you. At this time, I will yield 5 minutes to the gentleman from California, Mr. Campbell.

Mr. CAMPBELL. Thank you, Mr. Chairman. Welcome all, and a special welcome to you, Chancellor Drake.

The University of California, as I recall, a few years ago, about 18 percent of its total budget was State funds, total revenue, income, if you will. I do not remember how much was Federal or how much was tuition or how much was privately raised.

Can you tell me what that is either for the University of California, of which I am an undergraduate product, by the way, or UCI?

Dr. DRAKE. At Irvine, the State funds for Irvine are just under $300 million a year in a budget of $1.4 billion. You can do the math. We come out at around 20 percent. It is higher at campuses

that have no medical facility, because that is a big part of our budget at Irvine.

At Santa Cruz or Riverside, the percentage of State funding would be higher. It would be lower at a place like UC, San Francisco, where it is closer to 10 percent.

Mr. CAMPBELL. How much is private?

Dr. DRAKE. There is $300 million, State. Our Federal research grants and contracts are around 200 to $250 million a year, so we are looking toward about $600 million for us.

A lot of the rest of that, about $600 million of that, would be in the health care part of our budget. A large part of the health care budget then is Medicare and other things, probably about half of that.

The private investment in our research enterprise is actually relatively small. Students also pay fees at our institution—25,000 students at a fee of about $7,000 to $8,000 per student also is a big part of our budget.

Mr. CAMPBELL. And you have private contributions as well?

Dr. DRAKE. And we have private contributions. Last year, about $100 million, for a campus of our size. It is a public/private partnership in that way.

Mr. CAMPBELL. I am sure you would like to see more of everything. That is your job. Is that balanced? How does that balance feel to you or is there an objective within the University of California to change that balance?

Dr. DRAKE. Yes. There is an objective in two ways. I will tell you the places that we have looked at, and the place that is in the private sector and the place that is in the public sector.

In the private sector, we look actually for more fund raising. As the State, in this case, not the Federal Government, has decreased its support for higher education on a percentage basis, that puts stress on our ability to be able to compete for faculty and others with private institutions who charge much, much more for what they provide, 5 times as much, almost, for tuition.

We have a hard time competing if the State fraction goes down, unless we have private support to help us.

The place where it is most important for us to have Federal support is what I mentioned today, which is one of the most important places, which is in the research enterprise.

As we grow forward, that funding of basic research is not as attractive to the private sector. There is some. We have a lot of public/private partnerships. We care a lot about those. True basic research, when you are not even necessarily thinking about the product, is something that the private sector tends not to invest in very heavily.

Mr. CAMPBELL. You mentioned the doubling of NIH funds. I have heard some criticism, not specific to NIH, but that lots of money goes into research and where there is not a lot of product, output.

You talked about basic research, which can have a very long gestation period.

Is there something we could or should be doing with NIH to make it more effective or efficient?

Dr. DRAKE. I think that NIH is the envy of the world. As we travel around the world, when other countries are trying to emu-

late the great success of the United States, they try to put together something like the NIH, where you have a fund of money that is peer reviewed by scientists looking at the best ideas and the best new science that has a long enough period of support that a young scientist can become involved in an area and create a career by making real discoveries.

This has been an incredible model for us. As I mentioned, as we look at the United States in the last 60 to 70 years, and the real advances, particularly in the area that I work in, which is in medicine, we see them coming from discovery upon discovery that builds this great foundation.

I am a supporter. I worked in the lab and did basic research. I am a supporter of basic research based on peer reviewed merit, so we look at the best ideas and lead those forward, and then actually as that becomes a part of our knowledge, we then can look at ways to apply it later on.

We have done it awfully well in this past period.

Mr. CAMPBELL. No suggestions?

Dr. DRAKE. I would say that continuing to fund it at an adequate level is the most important thing. I am being as honest as I can. It really has worked. It is really the envy of the world. It has worked quite well. It needs your continued support.

Mr. CAMPBELL. Let me ask anybody who wants to answer. I am a CPA, so this is a bean counter oriented question.

One of the things that is unique to government accounting is that when public money is spent on something that has a useful life that is long, such as a road or a building at the University of California, Irvine, or wherever, we expense it all when the cash is put out, when the building is bought, which outside of government, that is not done at all in accounting.

Obviously, that affects decisionmaking. Has anybody ever thought about that or does anybody think that government should act more like private entities and set up an asset and depreciate those?

Yes. I will butcher your name if I say it. I will let you say it.

Mr. HAUGHWOUT. I am Andy Haughwout from the Federal Reserve Bank of New York.

I think it is important to note that State and local governments budget more in the way you are describing the private sector budgeting, that is to say they have capital budgets, which allow the use of debt to finance along with capital projects, and then pay for operating expenses, including maintenance, out of current revenues.

I think for those governments, that kind of institutional arrangement allows for the kind of long term planning you were alluding to.

Mr. CAMPBELL. Mr. Rapoport, a question for you, and I guess probably my last question.

Right now, Federal Government spending is about 20 percent of gross domestic product, and Federal taxes are slightly below that, hence, the deficit, I think 18.6, something like that.

That is about the historic average since 1960. A lot of the things that you suggest in your testimony would obviously increase that dramatically. That is just the Federal Government. I cannot recall the number with State and local, but I think it is somewhere north

of 30-something percent of GDP that is government related activity.

I would assume with the things that you are suggesting that you would take taxes considerably higher than the 18.6 they are at now and government spending higher than that.

Is there some place you think that can go without hurting the economy?

Mr. RAPOPORT. Yes, I would take it higher, actually. I think one of the places to look for comparison—the costs for health care, for instance, are borne somewhere. They are either borne by the government or they are borne by major corporations who pay for health care, or they borne by the individual. The costs are done.

In a number of the European countries, which in fact have done reasonably well in the global economy and on a trading basis as we have and have not had the kinds of inequality increases that the United States has had over the time, the taxation levels are up closer to 30 percent and yet if you actually take the costs to a consumer or taxpayer, and if you take out the health care costs that they no longer need to pay or the other costs, it may not be a much greater cost.

I might go up to the upper 20's and lower the costs for people in society in other ways.

Mr. CAMPBELL. Be more like Sweden.

Mr. RAPOPORT. Not a bad idea.

The CHAIRMAN. The other countries, how many are spending $100 billion a year on a war in Iraq?

Mr. RAPOPORT. Is that a question?

The CHAIRMAN. Yes.

Mr. RAPOPORT. None that I know of.

The CHAIRMAN. Thank you.

With that, the hearing is adjourned.

[Whereupon, at 3:42 p.m., the hearing was adjourned.]

# A P P E N D I X

March 23, 2007

**Testimony**
**Michael Drake, M.D.**
**Chancellor, University of California Irvine**
**House Committee on Financial Services**
**"The Role of Public Investment in Promoting Economic Growth"**
**March 23, 2007**
**Rayburn House Office Building, Room 2128**

Good afternoon, Chairman Frank, Ranking Member Bachus, and Committee members. Thank you for the opportunity to appear before you today to address the very important issue of public investment by the federal government in basic scientific research. This hearing serves as a reminder of the value of long-term public investment in general, and I look forward to discussing this issue with Committee members.

First, I should introduce myself and my institution. I am the Chancellor of the University of California, Irvine, which is one of ten campuses of the University of California (UC) system. At UC Irvine (UCI), we have nearly 26,000 students, and we conduct research in a wide range of the sciences that are supported by the National Institutes of Health (NIH), the National Science Foundation, the Departments of Defense and Energy, NASA, NOAA and several other federal research agencies. In 2006, UC Irvine received approximately $197 million from federal agencies to support peer-reviewed research projects. UC Irvine is among six UC campuses that belong to the Association of American Universities, an organization of 60 U.S. and 2 Canadian research universities that generally represent the cream of America's public and private research universities. AAU members perform about 60 percent of federally supported university-based research.

Our nation's system of higher education, particularly its diverse range of public universities, is a unique example of public investment that has paid enormous dividends for our nation. Federal investments in students and research build our human capital, propel the economy, improve health and quality of life, strengthen our national security, and help to ensure a strong and lasting democracy. In short, the American model of intertwining investment in education and research at thousands of independent public and private institutions has forged a success story unprecedented in history and is a model that is now being imitated by other nations in Asia and Europe.

America's colleges and universities produce human and intellectual capital that are the twin engines of economic growth. While public investment is not the only source of support, it is the single most important and certainly the added ingredient that has made U.S. research universities the envy of the world. As you well know, Mr. Chairman, from your personal experience, it is that formula that spawned the "Route 128" economic phenomenon in Massachusetts, as well as Silicon Valley in my state of California.

I am here today as the leader of a research university and my testimony will focus on the benefits of the research we and other universities conduct with the support of and on behalf of the federal government.

THE FEDERAL INVESTMENT IN STUDENTS

Before I do, given the nature of this hearing, I would not want to miss the opportunity to reiterate briefly the importance of the federal investment in student aid. The federal government is a critical partner in higher education, as we educate students, perform research, and provide healthcare services. Federal government funding is key to helping students attend college regardless of their income. The United States has made great progress in providing educational opportunity for all, but more work needs to be done. Since 1973, the portion of the nation's workforce with a college degree or higher has doubled. This growth would not have been possible without the partnership between the two largest sources of financial support for college students: the federal government and postsecondary educational institutions.

Federal student aid has helped to shape American postsecondary education since World War II. Starting with the GI Bill, enacted in 1944, the federal government has extended higher education opportunities to millions of men and women who otherwise might never have gone to college. Several landmark measures that followed the GI Bill have laid the foundation of our current federal student aid system.

These include the 1958 National Defense Education Act, which created what is now called the Perkins Loan Program; the 1964 Economic Opportunity Act, which established the college work-study program; and the 1965 Higher Education Act, which set the framework for federal aid and now authorizes Pell Grants, the Supplemental Educational Opportunity Grant (SEOG), Leveraging Educational Assistance Partnership (LEAP), and the Federal Family Education Loan (FFEL) and Direct Loan (DL) programs.

The Pell Grant is the cornerstone of today's federal need-based student aid programs. It constitutes 68 percent of federal grant aid to students, helping more than five million undergraduate students attend college. Unfortunately, the maximum Pell Grant has lost considerable buying power over the past several years, dropping 20 percent in constant dollars since 1975. We appreciate that, for the first time in five years, Congress enacted an increase in the maximum Pell Grant award to $4,310, but this is far short of the higher education community's recommended goal for 2008 of $5,100. Investing in Pell Grants is the most important way the federal government can continue to provide access and opportunity to all those who wish to attend college.

Congress also has established two programs that are very important to research universities because they assist graduate students – the Graduate Assistance in Areas of National Need (GAANN) and Javits Fellowships. These programs support the entire range of academic disciplines, including the sciences, arts, social sciences, and the humanities. Recipients of these awards are expected to become experts who will contribute to the research, training, and innovation that are critical to maintaining and advancing our technology infrastructure, national security, and economic prosperity.

It is also important to note that the largest portion of grant aid to students actually comes from colleges and universities themselves. They provide 41 percent of total grant aid, with federal grants (including loans) composing 31 percent and states and private sources providing the remaining support. AAU's 60 U.S. institutions alone provided approximately $2 billion in grant aid to complement the federal investment in student aid in FY2005-06. My own university provided nearly $63 million in institutional aid in 2005.

THE FEDERAL INVESTMENT IN RESEARCH

Now I would like to turn to the federal government's investment in university-based research. It is important first to provide some historical context. Mr. Rohatyn has done an excellent job of describing some of the important investments made by the United States government, in the 19th and 20th centuries particularly, that laid the foundation for this nation becoming the superpower and the global economic powerhouse that it is today.

I would like to describe one more, and that is the series of legislative and budgetary actions that followed the successful launch of Sputnik by the Soviet Union on October 4, 1957, 50 years ago next October. That event was a signal that our nation's scientific and educational leadership could not be taken for granted, that instead we needed to expand our investment in the system if we wanted to stay ahead. After Sputnik, a national strategy making education and research central to the building of American strength emerged virtually overnight.

Our government's investment in scientific research grew significantly after World War II, due to the belief that it had been a very important contributor to our military success. Based in part on a groundbreaking report, "Science – The Endless Frontier," by the Massachusetts Institute of Technology's (MIT) Vannevar Bush, who served as President Franklin Roosevelt's unofficial science advisor, we created a number of new scientific institutions. In 1948, Congress established the National Institutes of Health and in 1950 the government also created the National Science Foundation to support basic research.

The launch of Sputnik in 1957 prompted Congress to vastly strengthen the government's scientific enterprise and to create a number of new institutions such as NASA and the Department of Defense's Advanced Research Project Agency – now known as DARPA. In the years immediately following Sputnik, between 1957 and 1961, the federal investment in research and development more than doubled, and total government outlays for basic research at NSF and other agencies tripled. Based on a model established during World War II, much of this investment went into laboratories at U.S. universities, which were viewed as the government's partners in conducting research.

The education portion of the post-Sputnik strategy was embodied in the National Defense Education Act (NDEA) of 1958. It created new programs to support the development of modern curricula in K-12 science and math and to upgrade the quality of science teaching; it created new graduate fellowships to encourage development and expansion of Ph.D. programs in all disciplines; it provided for low-interest student loans to undergraduate and graduate students with financial need; and it authorized the creation of foreign language and area studies centers to

improve the nation's knowledge of languages and cultures, as well as institutes to train elementary and secondary foreign language teachers.

These combined developments created an unrivaled research enterprise, helping to quadruple the number of U.S. Nobel prize winners in science in the second half of the 20th century and leading to untold discoveries that helped to transform the country and, indeed, much of the world.

There is no doubt that university research is a vital building block in our nation's R&D enterprise. Universities perform 54 percent of the nation's basic research. The system under which the federal government supports university research has long been a uniquely American system. Many other nations maintain bureaucratic control over research through national research institutes.

In our country, the merit review system ensures that support for research is based on scientific merit rather than other considerations such as politics or heavy-handed bureaucratic control. Indeed, the merit review process has provided the opportunity for the world's best research to be conducted at universities both small and large across this country, an opportunity that has fostered the development of the extraordinary science that we have experienced for the past half century and more.

Moreover, this system produces what I believe is one of the world's great "twofers." Because along with creating new knowledge and the foundation for new products and processes, U.S. universities use their research activities to educate students who will become the next generation's scientists, teachers, and leaders in government and industry.

My own university is an excellent example. Over the past 40 years, as a consequence of hard work, many good recruitment decisions, and important state and federal investments, UCI has risen to become of one of our country's leading research university campuses. We are now an important part of our nation's innovation system, and of our regional economic growth. Of course our graduate students spend much of their time in our laboratories, and much of the work in which they have the opportunity to participate is federally funded. But this is often true of undergraduate students as well. Faculty-mentored research has become an integral component of the education an undergraduate receives at UCI, including participation in research supported by NIH, NSF, and other federal agencies.

The American model of higher education, in which education and research are intricately entwined, allows for fusion of the educational experience. This close linking of education and research is training the future workforce of our nation. A fundamental reality of American science is that, as likely as not, the scientist who produces the next great discovery will have worked as a graduate student in a lab funded by a federal research agency and have conducted his or her own award-winning research with federal support. And every American is better off for our having developed this unique combination of research and education.

Indeed, the successes of this system are so extraordinary, that we often take them for granted. We often forget how big a role federally supported university research has played in laying the foundation for products and other advances that have fundamentally changed how Americans

live, dramatically improved the quality and length of our lives, made business and our economy exponentially more productive, helped us to defend our country, and taught us ever more amazing things about the world and the universe in which we live.

In my own field of medicine alone, annual cancer deaths in the United States have fallen for the second consecutive year. This drop in cancer mortality, a first in history, is occurring despite the aging of our population.

The rapid identification of HIV/AIDS in the early 1980's was a result of research from the War on Cancer into the possibility that a newly discovered class of viruses, retroviruses, might cause cancer.

Herb Boyer, a University of California San Francisco professor and later the founder of Genentech, developed the Recombinant DNA technique, which revolutionized the field of biology and spawned the modern biotechnology industry. This led to the creation of such artificial substances as human growth hormone, interferon, interleukin II, hepatitis B vaccine, and blood clotting and blood dissolving substances.

Based upon projections from the 1970's, NIH estimates that there has been a 60-percent drop in mortality from heart attack and stroke. Savings from the improved prevention and treatment of cardiovascular disease are estimated by The New York Times to return $500 billion to our economy annually.

It used to take years, and often decades, to develop vaccines. But this is no longer the case, and our ability to identify viruses and develop vaccines continues to accelerate. Four years after the arrival here of the West Nile virus, candidate vaccines were in clinical trials. One month after the World Health Organization sounded the alarm on Sudden Acute Respiratory Syndrome (SARS), the virus that causes SARS had been genetically sequenced and after another six months, the first candidate vaccine entered a clinical trial at NIH.

These are truly revolutionary advances, with enormous positive benefits, that were made possible by our government's support of basic research. None of this would have been possible as recently as fifteen years ago.

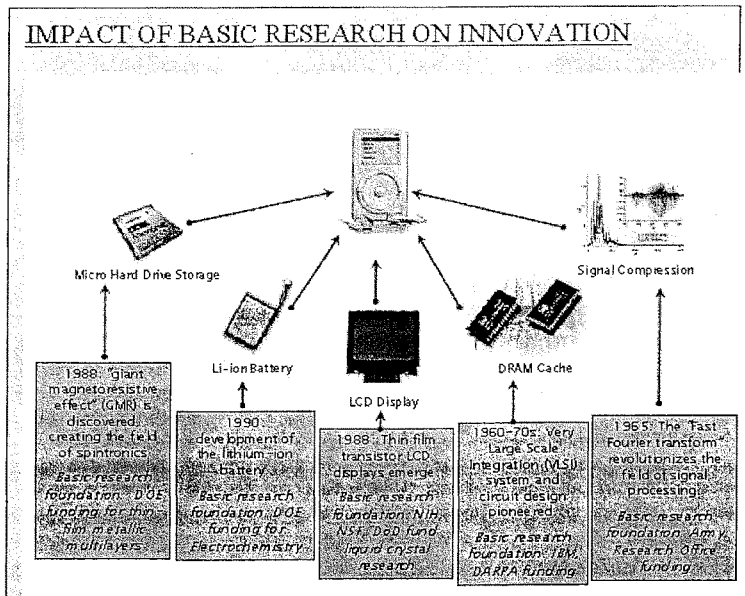
There are countless other examples. University researchers:

- Pioneered the development of satellite camera technology, which has led to precise photography vital to space exploration, weather forecasting, geology, and military surveillance.
- Performed the fundamental research that led to development of the Global Positioning System (GPS), which has had extraordinary military and civilian applications.
- Revolutionized agriculture by developing vaccines and treatments that have eliminated or controlled hundreds of plant and poultry and livestock diseases, and by developing high-yielding, disease-resistant fruits, vegetables, and grains.
- Created the first digital computer and played leading roles in all phases of subsequent computer processing and microprocessing developments.

- Provided the basis for what became the Internet, and then the modern search engine.
- Developed the first atom smasher and pioneered and developed the science of nuclear physics, creating the modern age of nuclear power, weapons, and medicine.
- Laid the groundwork for space exploration by developing the fundamental principles and technology of rocketry and played a key role in America's space program from the beginning to the present.
- Developed the technologies that make possible the ubiquitous cell phones and PDAs that help define the way many of us live today. These technologies also make it possible for developing countries to acquire communications technologies quickly and advance their standards of living.

And we should not forget to mention the benefits of social science research in economics, psychology and political science areas among others. For example, research done by economists on auction theory was used by the FCC to structure the phenomenally successful auctions for cellular spectrum that yielded tens of billions more for the government than previously expected.

And how many inventions over the past decade have captured the public's enthusiasm as the MP3, the best-known example of which is Apple's iPod? The following graphic, created by the White House Office of Science and Technology Policy (OSTP), shows how this extraordinarily popular and innovative device is built upon several technological developments which had their origins in basic research funded by the federal government and conducted in large part at research universities.




*The development of MP3 technologies illustrates the unexpected benefits of basic research. In 1965, a hand-sized storage and playback device that would hold 15,000 recorded songs was the stuff of science fiction. Even simple hand-held calculators were rare and expensive at that time. Research funded by the Department of Defense, the National Science Foundation, the National Institutes of Health, the Department of Energy, and the National Institute of Standards and Technology contributed to the breakthrough technologies of magnetic storage drives, lithium-ion batteries, and the liquid crystal display, which came together in the development of MP3 devices. The device itself is innovative, but it built upon a broad platform of component technologies, each derived from fundamental studies in physical science, mathematics, and engineering.*

As OSTP notes, this is also an excellent example of the sometimes serendipitous nature of basic research discoveries. They can lead to developments the scientists themselves never dreamt of. Even the laser—which does everything from performing eye surgery to playing music to printing out this paper—was originally dubbed, when it was first developed by a Columbia University professor, as a "solution without a problem."

ECONOMIC IMPACT

There are various measures of the economic impact of basic research and of research and development in general. Most notable is the work of Nobel prize-winning economist Robert Solow who found that significant levels of economic growth could be attributed to technological advances and "technical change in the broadest sense."

Economists attribute a significant amount of economic growth – as much as 50 percent over the last half century – to innovation, that is scientific and technological advances many of which were the result of federal investments in education and research. Citing innovation as the reason for the gains in productivity during the 1990's, then-Federal Reserve Chairman Alan Greenspan told Congress: "Had the innovations of recent decade, especially in information technologies, not come to fruition, productivity growth during the past five to seven years, arguably would have continued to languish at the rate of the preceding twenty years."

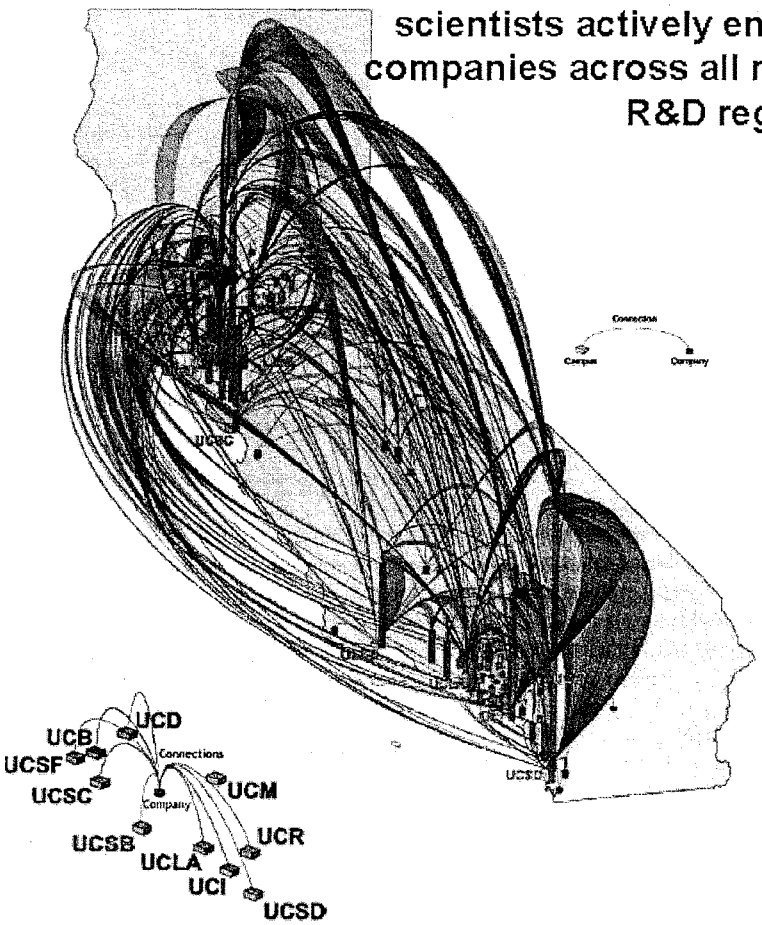
One of the most comprehensive analyses of the economic benefits of academic research was conducted in the early 1990's by Edwin Mansfield of the University of Pennsylvania. Based upon his research, Mansfield concluded that the average annual rate of return to society from academic research was anywhere from 28 to 40 percent. The Congressional Budget Office, in a 1993 review of Mansfield's estimates, said that "the return from academic research, despite measurement problems, is sufficiently high to justify overall federal investments in this area."

More recently, a study by the Federal Reserve Bank of Cleveland on economic growth in individual states noted that innovation and education – the two primary outcomes of the federal research investment at our universities – were the most important factors in determining growth in state per capita income. The study calls into question the view held by some that manufacturing is the most important source of wealth. It also suggests, as more and more industrial leaders have stated, that the U.S. will not be able to compete in the global economy based on cheap labor costs. Instead we need to be smarter and more innovative if we are to remain globally competitive and to keep high-wage, high-value jobs from going abroad.

Again, investments in research at our universities are critical to this process. To quote Alan Greenspan again, from remarks made in October 2002, "If we are to remain preeminent in transforming knowledge into economic value, the U.S. system of higher education must remain the world's leader in generating scientific and technological breakthroughs and in preparing workers to meet the evolving demands for skilled labor."

In my own state of California, one can readily see the impact on our economy of research at the ten campuses of the University of California. Following is a chart that we fondly refer to as the "bad hair" chart. This chart, developed by Dr. Cherisa Yarkin, director of economic research at the UC Industry-University Cooperative Research Program, shows collaborations between scientists at UC campuses and businesses around our state. The color version of the chart distinguishes among the campuses. But the black-and-white version tells the overall story. Some 1,320 California R&D companies put UC research to work.

# University of California scientists actively engage companies across all major R&D regions



WHY THE FEDERAL GOVERNMENT?

A fundamental question that we have to answer in this discussion is, why shouldn't somebody else do this? After all, private industry develops this research into products, so these inventions and discoveries are ultimately a source of revenue for them. Why don't they pay for the research? That's a fair question. The fact is that business spends an enormous amount of money on research and development. Indeed, several decades ago, the federal government used to perform or support two-thirds of all R&D in the U.S., while business was responsible for about one-third. Today, the opposite is true, as the private sector supports or conducts two-thirds of all R&D.

However, there is a big difference between what the government does and what business does. Most of what business does is development of final products, not the basic research that produces the building blocks that make it possible to create that final product. The iPod, which I have already cited, is a product that reflects the ingenuity and creativity of the American private sector. And Apple undoubtedly spent a very substantial amount of money to develop it. But the iPod would not have been possible without the basic research that came before it.

So why doesn't business do more basic research? For example, the private-sector labs of the 1960's, such as Bell Laboratories, are no longer doing the groundbreaking research for which they were so well known. The answer is that companies can't afford to do it. For the private sector, basic research is a high-risk investment for a number of reasons. First, the outcome is very uncertain in terms of products and profitability. In fact, while such investments have broad-based societal and economic benefits, a breakthrough in basic research supported by a company may ultimately benefit a competitor or an entirely different industry more than the company performing the research.

Moreover, investments in basic R&D may take years to bear fruit. A potential return ten or twenty years out is not something our highly competitive private sector can invest for and be guaranteed the ability to make a profit. Norm Augustine, the former CEO of Lockheed Martin, chair of the National Academies of Science committee that wrote the landmark report "Rising Above the Gathering Storm," and a passionate advocate of federal support for basic research, frequently tells how his company proudly announced a program of long-term investment in basic research, only to watch its stock sink. The fact is, the stock market simply won't allow companies to invest significantly in long-term basic research.

With few exceptions, the states simply lack the means to invest heavily in R&D. California as the world's 7th largest economy is an exception to the rule.

In my own state of California, Governor Arnold Schwarzenegger and the state legislature have recognized the role of university research in helping the economy. As an example, on December 27, Governor Schwarzenegger announced his Research and Innovation Initiative, which proposed to spend nearly $95 million in the state budget – $25 million from the general fund and $70 million from lease revenue bonds – for the four California Institutes for Science and Innovation. These institutes link two or more UC campuses with industry partners to focus on a specific area of research such as nanotechnology, biotechnology, information technology, and

telecommunications. One of these institutes, the California Institute for Telecommunications and Information Technology (Calit2), is a partnership between my campus and UC San Diego. Calit2 has built effective intercampus collaborations and new paradigms for performing multi-disciplinary research and education. It also is defining worldwide and community-based networking scenarios to serve a broad spectrum research areas and global societal needs.

The Governor's 2007 Budget proposed $30 million in lease revenue bonds to the Helios Project, run by the UC-managed Lawrence Berkeley National Laboratory, to create sustainable, carbon-neutral sources of energy. This includes the next generation of super-efficient solar energy technology that will help reduce greenhouse gases and oil dependency. The proposal also included $40 million in lease revenue bonds for UC in the event that one of its campuses won the global competition for British Petroleum's $500-million grant to build and operate an Energy Biosciences Institute. The Institute will focus on converting biomass materials into fuels, converting fossil fuels to energy with less environmental damage, and maximizing oil extraction from existing wells in environmentally sensitive ways. On February 1, BP announced that UC Berkeley and the Lawrence Berkeley National Lab, in partnership with the University of Illinois at Urbana-Champaign, had won this global competition.

Investment in basic R&D requires both the means and being risk tolerant; two variables that the federal government can absorb more effectively and efficiently then states can.

Sometimes the states seek to pick up the slack when they believe the federal government is lagging. For example, several states have undertaken research initiatives using embryonic stem cells. But as NIH Director Elias Zerhouni told Congress just last week, state-by-state pursuit of any kind of research does not provide the necessary leadership. Back in California, we passed Proposition 71 which created the California Institute for Regenerative Medicine (CIRM). And while my campus receives large million dollar grants from CIRM, and continues to be a leader in the area of stem cell research we still fall short in terms of funding. I applaud Congress' leadership on the stem cell issue and their efforts to pass legislation that will expand access to this valuable area of research. It is critically important that NIH has adequate funding to support all types of biomedical research, including stem cell research. The reality is, leadership in basic research must be at the national level.

But the federal commitment to basic research has had a mixed record in recent years. It's true that Congress and two successive Administrations doubled funding for the NIH over the five year period of FY 1998-2003. However, since that investment, NIH funding has not kept pace with inflation and the benefits of that historic investment have already started to erode. Additionally, research in the physical sciences and engineering has been nearly flat-funded over some three decades. There is now recognition in both political parties of the need for greater funding of research in the physical sciences, as well as a continuation of Congress' commitment to fund the life sciences. Given the growing importance of interdisciplinary research, adequate funding for both the life sciences and the physical sciences is essential. Without it, the country will miss opportunities that are developing in, for example, bioinformatics, bioengineering, and biophtonics. These fields allow scientists to attack problems in new, innovative ways.

THE FUTURE

If Congress does indeed strengthen the federal role in funding basic science, what future opportunities should we pursue? That is for policymakers, with advice from scientists who can tell them about the possibilities, to decide. However, an obvious area is the development of reliable and environmentally sound water systems. For example, the Urban Water Research Center at UCI is working with the Environmental Protection Agency, along with local and state organizations to advance the understanding of the distinct characteristics of the urban water environment in order to assist people and institutions in their effort to promote health, enhance the efficient use of water resources, and protect environmental values. The Center is a partnership with 60 faculty members and a variety of departments at UCI, including Civil and Environmental Engineering, Earth System Sciences, UCI Ecology and Evolutionary Biology, Occupational and Environmental Medicine, Planning, Policy, and Design, UCI College of Health Sciences, and many others. Working together, these departments are able to effectively address the multitude of interdisciplinary water problems that people face in the modern urban environment.

Other obvious areas for research likely to be fruitful in the coming years are global disease prevention and cures; new diagnostic tools based on our understanding of the human genome and proteomics and further advances in the physical sciences; how to address our compelling environmental problems, including global climate change; and national and homeland security related problems, from improving technologies for detection of weapons of mass destruction to improving how we protect our soldiers in combat.

One other powerful opportunity is the focus of a report issued earlier this week by the Alzheimer's Association. The report stated that more than five million Americans now have that disease. While this is a 10-percent increase over five years ago, the number may triple by 2050, as baby boomers age. The disease afflicts one in eight people over 65, and 42 percent of those over 85. Anyone who has a family member with Alzheimer's can tell you how wrenching this disease is, and how devastating the costs of handling the disease can be. I believe that enormous progress could be made in diagnosing and treating this disease in the next ten years if the funding were available.

And then there is that extraordinary discovery we can't even imagine. Who could have predicted the Internet revolution? Who could have thought that HIV/AIDS, in less than ten years could be turned from a near-certain death sentence to an onerous but survivable burden for those fortunate enough to live in the United States and receive triple-drug therapies? Who could have thought that mortality due to childhood cancers, surely among the cruelest of diseases, could be made to decline for more than a decade? And who could have thought that we could peer twelve billion years into the past to view the universe in its infancy? These accomplishments are a direct result of the federal government's commitment to research funding.

CONCLUSION

As a university chancellor, I often have to think in terms of revenues and infrastructure and hiring packages. But when it comes to the extraordinary research we have done and will do, I also put on my physician's cap and marvel at how the diagnostic tools and therapies and preventive knowledge that have been developed in recent decades have transformed the practice of medicine and changed the quality of life in America for nearly 300 million people. As a physician, it's easy to remember to thank the scientists and the technicians and the industries that made the discoveries and produced a final product. But we can never forget that none of this would be possible without public investment in basic research. There is no doubt that the long-term investment by the federal government in basic scientific research has improved the lives of the citizens of the United States and made this a better country and a better world.

Now we must find the national vision and the political will to transform how the debate over support for research and education is framed. We must make it politically unacceptable for policymakers to fight over research and education funding at the margins of a $2.7 trillion federal budget. We must persuade our national political leadership that sustained investment in research and education will help to ensure continuing U.S. global leadership and produce medical innovation, economic growth, and a higher quality of life for all of our citizens.

We are encouraged by, and appreciate, the recent actions taken by this Congress in its FY07 funding decisions to increase research funding for NIH, NSF, NIST and the Department of Energy's Office of Science and renewable energy activities. I request that you continue these trends into FY08.

Only the federal government has the resources and the ability to support this vital research. I know that it is difficult to obtain additional funding resources in a discretionary budget that is nearly frozen at the overall level. But the good news is that the additional resources needed to sustain our leadership in scientific research are not excessive. I thank this committee for bringing the nation's attention to this incredibly successful partnership and hope it will continue to spread that message through the Congress and the Administration.

Thank you.

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# PUBLIC INVESTMENT

Statement before the
Financial Services Committee
United States House of Representatives

March 23, 2007

Andrew F. Haughwout

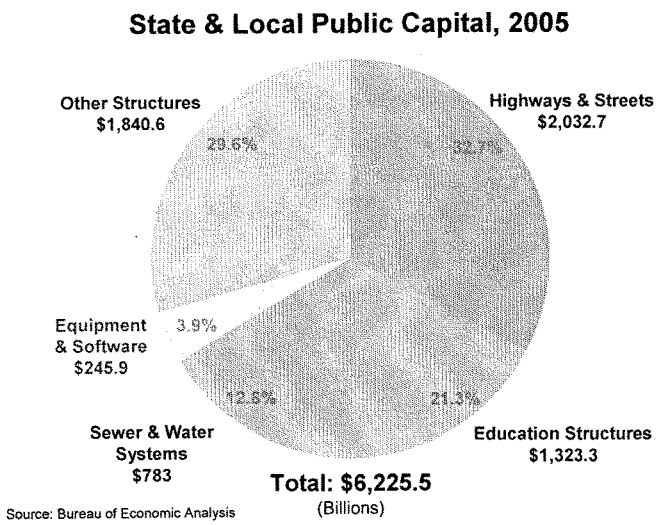
Andrew F. Haughwout is a Research Officer at the Federal Reserve Bank of New York.
The views expressed here are those of the author and do not reflect those of the Federal Reserve Bank of New York or the Federal Reserve System.

Chairman Frank, Ranking Member Bachus, and Members of the Committee:

Thank you very much for the opportunity to speak to you on the important subject of public investment. Today I will be discussing research on public investment and its relationship to economic growth and well-being. All the views I will express are my own, and not those of the Federal Reserve Bank of New York or the Federal Reserve System.

Physical public capital – what I will refer to as infrastructure – is the dominant component of the nation's publicly owned wealth, and it is that kind of investment that my research has focused on. This infrastructure stock consists largely of highways and streets, buildings like schools, stadiums, and city halls, and sewer and water systems (Figure 1).

**Figure 1**



The flow of new public investments in physical capital was about $430 billion in 2006 (Figure 2), an amount that was added to a stock of publicly owned physical capital that would have cost nearly $8 trillion to replace in 2005, according to the Bureau of Economic Analysis. Public capital represents about one-fifth of total (public and private) non-defense fixed assets (Figure 3). About 90% of the stock of non-defense public assets in the United States is owned by state and local governments. Of course, the federal government plays a large role in financing the construction of capital goods that state and local governments own.

**Figure 2**

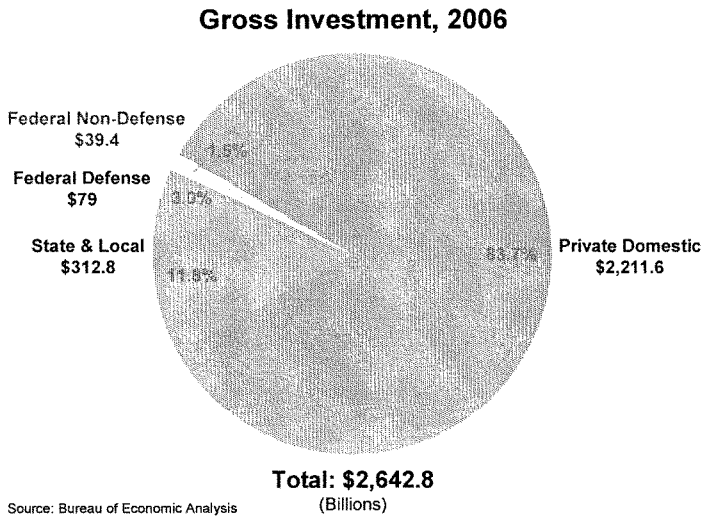
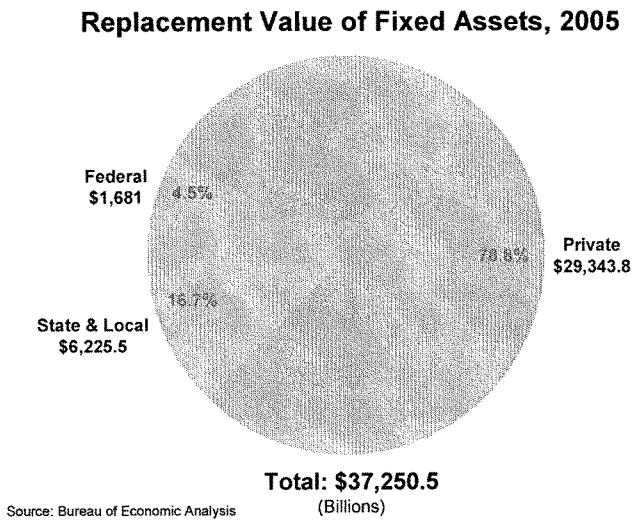


**Figure 3**




The ultimate goal of the large amount of resources devoted to public investment is improvement of the welfare of the American people. In my view, there are three crucial issues surrounding our public investment policies. The first concerns how and to what extent public investment affects economic growth, an issue that has formed the centerpiece of economic research on infrastructure. The second, which has received far less attention from economists, is based on the idea that infrastructure may have direct effects on households, because these investments influence households' ability to consume valuable goods that are not traded in markets. These are benefits that do not appear in the usual income accounting framework. The third issue centers on the notion that the total benefits we receive from our public investments is affected by how we

finance and locate new investments, since where activities occur has significant effects on levels of both productivity and household well-being. Below, I discuss each of these issues and provide examples.

**Evidence of the Effects of Infrastructure Investment**

Perhaps not surprisingly, economists' research on the effects of infrastructure investment has focused on income growth. Income and firm activity are relatively easy to measure, since statistics on income, output, and employment are carefully collected and widely available. Household well-being is a much more elusive and difficult-to-measure concept. So the majority of economic research on infrastructure has asked the question, "What effect do additions to the stock of public capital have on growth of firm productivity, output, and employment?"

There have been many studies over the last twenty years that were designed to answer this question. This research is based on the fact that private companies are users of infrastructure systems like highways, water and sewer systems, etc. When these infrastructure systems are expanded, companies can become more efficient, and the benefits show up as more jobs and investment, higher wages, and higher returns on capital.

There is no doubt that well-functioning infrastructure systems are critical to a well-functioning economy, but it is also clear that the US already has extensive public infrastructure. The evidence we currently have points to a conclusion that additional infrastructure investments have positive effects on firms. Unfortunately, it is also fair to say that no consensus has emerged on the critical issue of the magnitude of these effects.

Early estimates – from the 1980s - had indicated that infrastructure's contribution to firms' output was approximately twice as large as that of private capital, which led to concerns of a severe infrastructure shortfall. More recent research has resulted in significantly lower estimates of the productivity of infrastructure, and most economists now agree that the earlier estimates were too high. While the exact size of public infrastructure's contribution to income growth remains a subject of some controversy, many recent estimates put the figure at a level somewhat below the return to private capital.

The social value of infrastructure as a direct contributor to household welfare has received relatively little attention, in part because the quality of life is difficult to measure. But in my opinion, the consumption benefits of public investments are likely to be very important because households, just like private firms, are heavy users of public infrastructure systems.

Of course, some public works are specifically designed to benefit households alone. An obvious example is the construction of public parks and recreation facilities. The nearly $8 billion that state and local governments alone spent on parks and recreation capital in fiscal year 2004 seems clearly intended to provide direct benefits to households. Even elements of what many authors refer to as "core infrastructure" -- transportation, sewer and water systems -- provide large direct benefits to households.

An example may clarify the difference between the productivity studies that currently dominate much of the economics literature and a more comprehensive accounting of infrastructure's benefits. Imagine that the state builds a new road from your home to your place of work that cuts your one-way commuting time by 15 minutes. Will

you arrive earlier at work each day, or sleep later? The way economists have traditionally thought about infrastructure implies that all employees will choose to arrive early at work, increasing the output they produce. But at least some workers will probably sleep later or read the paper longer each morning. This potential for increased leisure will not be accurately measured in standard studies of income or productivity, but is still a real benefit, since it improves the well-being of the individuals whose homes are newly accessible. Accounting for the consumption value of public works is thus an important, but difficult, task.

Few studies have undertaken to measure the consumption benefits of public investments on a large scale, but some evidence is available. In my own work, I have used a spatial equilibrium model to estimate the aggregate value that households put on public investments in central cities and metropolitan areas. Using this method, I estimated that the present value to households of increases in central city infrastructure is considerably higher than the comparable benefit to firms.

**The Importance of Location**

One of the distinguishing features of infrastructure investment is that it is largely fixed in place. The idea that fixed public investments, especially transportation infrastructure, alter the geography of economic activity is supported by both economic theory and a substantial historical record. But geography has not been central to most infrastructure research until recently. The basic question posed by state infrastructure productivity studies is whether states with more public capital grow faster than those with less. But relatively few these studies have taken seriously the possibility that additions to

infrastructure stocks have important effects on patterns of activity within states. These effects could be very significant.

The interstate highway system, for example, was developed primarily to facilitate interstate travel for private businesses and government. But today's interstates serve many functions, including moving people around within metropolitan areas. I believe that there is now convincing evidence that the interstate system has helped facilitate the movement of population and jobs to suburbs.

Even if new infrastructure investments do not have very big measured effects across states, it does not necessarily follow that they are not valuable to private employers and households. The fact that these economic agents move *within* states in response to infrastructure development indicates that they value it quite highly.

If one of infrastructure investment's primary effects is to induce changes in the geography of economic activity, then a relevant question becomes whether these changes have any implications for well-being. Evidence from a variety of studies indicates that where things happen is an important determinant of economic well-being and growth and that an important way in which infrastructure policy affects the economy is through this indirect channel.

A large body of research indicates that private firms in urban environments are more productive than their counterparts in less densely developed areas. There are many reasons for this phenomenon, ranging from easier matching of employees and jobs in thick labor markets to spillovers of ideas from one firm or industry to another. A typical and influential study shows that doubling employment density across counties within a state increases output per worker by 6%. And more recent evidence suggests that these

kinds of benefits are spread over relatively small areas – one influential study indicates that over 80% of the growth benefit of a cluster of firms is captured within a radius of just one mile. So fostering the growth of dense centers is a key mechanism for fostering income growth.

Because they are valuable and are often placed in relatively undeveloped areas, public investments provide individual firms and households with incentives to move from more to less dense environments. But if decentralization *reduces* productivity growth, then the placement of new infrastructure goods in relatively undeveloped areas may not be the most effective use of public monies.

**Project Selection and Finance**

An important challenge for policymakers is thus to design institutions that can maximize the effectiveness of our infrastructure investments in light of the importance of intra-state relocations in determining the aggregate benefits of these investments. Organizations with a broad geographic scope have become influential bodies for making infrastructure investment decisions. Metropolitan planning organizations (MPOs) like the North Jersey Transportation Planning Authority and the New York Metropolitan Transportation Council -- the MPOs for the New York City area – have been empowered by the federal government to balance regional interests in making many of the relevant choices in transportation policy. In many areas, port and transportation authorities are designed to prioritize projects based on their contributions to well-being in the region as a whole. Yet the authority of these organizations is typically limited to transportation, and they often do not have control over the amount of money they have to spend.

The decentralizing effect of infrastructure investments is partly attributable to our system for paying for new public works projects. Because public works are funded by a complex web of local spending, state aid and direct spending, and federal grants, a large share of the cost of new infrastructure can be exported through the tax and grants systems. This financing structure makes it possible for localities to push for new public works that will provide local benefits, while much of the cost is paid by residents of other places. As a result, new or improved infrastructure might be skewed more to less dense areas than is evident or intended. Maximizing the effectiveness of our public investment budget requires careful attention to both the levels of funding and the design of institutions for allocating infrastructure investments.

# Testimony of Miles S. Rapoport
# President, Demos: A Network of Ideas and Action
# United States House of Representatives
# Committee on Financial Services
# Hearing on "The Role of Public Investment in Promoting Economic Growth"

## March 23, 2007

Chairman Frank and Members of the Committee,

I deeply appreciate the opportunity to be with you today, and thank the Committee for turning its attention to this critical issue. To introduce myself briefly, I currently serve as the President of Demos: A Network of Ideas and Action. Demos is a non-partisan policy and research center founded in 2000. We focus on problems of democratic participation and economic opportunity, and on the enormously important question you are considering today: the proper role of government in our society and in our economy. In the 1980's and 90's, I was in state government in Connecticut, serving as Secretary of the State, but also for ten years in the Connecticut legislature, where I was a member of the Finance Committee. The role of public investment was central to all that experience.

As a legislator in Connecticut, I took part in vigorous debates over public investment. In some cases we were dealing with the results of sustained underinvestment – the all too common pattern of crisis and catch up. I was a freshman legislator when the Mianus River Bridge in Greenwich collapsed, killing several people and hobbling transportation on the I-95 corridor for months. The investigation afterward revealed years of "deferred maintenance" due to cost cutting within the Transportation Department.

In other cases, Connecticut was more forward-looking. In the early 1990's the state committed itself to an ambitious initiative, known as "U Conn 2000," in which a decade's worth of sustained investment had a major impact, enhancing the university's reputation, attracting faculty and research grants, and increasing enrollment from in-state as well as out-of-state students.

Ten years ago, the city of Hartford was in major economic difficulty and social crisis. There, too, significant state investments – in arts and culture, school construction and funding, a convention center, improved transportation – made a huge difference; and through its commitment, the state helped inspire a parallel infusion of private capital. Together, this has resulted in a significant increase in jobs, economic activity, housing of various kinds, and arts and entertainment venues – in short, it has had an enormously important and salutary effect on the city of Hartford.

These examples helped shape my views on public investment. They were my education in what happens when America fails to invest in the public structures that under-gird our economy and quality of life; and my education in the leading role that public investment can play in economic development.

Beyond the value of any particular form of public investment, I believe it is important to restore a broad understanding of the role played by public investment and the public sector in our economy and the quality of our lives. The prolonged prosperity that led our nation out of World War II and created America's signal achievement—a broad and vibrant middle class—was accomplished with policies that included major public investments. VA and FHA mortgages helped millions of young families buy homes. Funding from the GI Bill, and later from Pell grants and Stafford loans, helped additional millions of young Americans finance their education; the farsightedness of many state leaders allowed public university systems to expand and to accommodate hugely

increased numbers of students. All of these public investments created opportunities for young families to get a leg up and build a future for themselves and their children.

Unfortunately, this commitment to investing in shared prosperity has waned. Over the past thirty years, public investment has been systematically devalued. This has been less a financial shift than an intellectual one. There has been a sustained and relentless critique not only of government's excesses, but of government itself. The ideals of the marketplace have been elevated and extended into arenas previously occupied by an understanding of a shared common good. In his 1996 book, ***Everything for Sale***, Robert Kuttner points out that in the notion of the "mixed economy," which was ascendant through the early 1970's, "Government intervened to promote development, to temper the market's distributive extremes, to counteract its unfortunate tendency to boom-and-bust, to remedy its myopic failure to invest too little in public goods, and to invest too much in processes that harmed the human and natural environment." However, in the 70's and 80's, this notion faded, and "newly self-confident conservative economic theorists… became the intellectual champions of privatization, deregulation, and liberation of the global marketplace. It all boiled down to one very simple core precept: market is better." The intellectual case had a powerful wind at its back from interests that expected to benefit – and did benefit – with this exaltation of the private sphere over the public.

All of this has left Americans with a very negative view of government, which has deeply impacted the climate in which public-investment decisions are made. Careful research

undertaken for Demos by the FrameWorks Institute showed that people have two dominant images of government, both negative. The first picture is of politicians fighting and attacking one another; the second picture is of an ill-defined bureaucratic monolith that has little to do with people's daily lives. Many Americans see government as an entity that exists to tax them for the sake of others. Most people give little conscious thought to the vast number of ways in which, every day, government, properly run, affects them – through the water they use and drink, the solidity of the sidewalks they traverse, the safety of the food they eat, the integrity of the courts they rely on for the resolution of disputes, the security of the banks in which they deposit money, the responsiveness of fire departments and other emergency services. It is a very long list.

Because of this systematic devaluing of government, we are caught in a vicious cycle of distrust, which makes it difficult for people to see the benefits of public investment, and thus contributes to continued underinvestment in the public structures that allow people to move forward in our country. The consequences have been severe, not only in the failures of physical infrastructure, but in everyday human terms. Among many, let me name three.

The first is inequality, which has increased dramatically in America over the last thirty years. I believe this is a direct consequence of the shift from public investment to private - from public-good values to market values. The rewards of private investment have gone to a small number of people, who have pulled far ahead of the rest of us. It is by now a familiar tale - the top 10% of Americans increasing their share of personal income from

about 30 percent in the postwar era, and as recently as the mid-1970s, to 46 percent by 2004.[i] Meanwhile, the share of income going to the bottom 60 percent has plunged – from 32.1 percent in 1967 to 26.6 percent in 2005.[ii] Is this connected to the lack of public investment? I believe it is.

The second consequence is the highly disturbing fact that for the first time in recent American history, the next generation will not be, as a whole, better off than the previous one. This is vividly laid out in the book, ***Strapped,*** by Demos Economic Opportunity Director Tamara Draut. If you compare today's young Americans with my generation, she shows, it has become far more difficult - unless your parents are well-to-do - to achieve the hallmarks of middle class adulthood—getting a college degree and paying off student loans, buying a home, having health insurance, and having children. In each of these areas, with the exception of child care which was entirely in the private domain, public policies and public investments were a huge assist to families getting started. In each, our investments have declined significantly.

The third consequence is felt in those particular areas of life where – if we could look at the question with open minds – Americans would realize that government is likely to achieve important economic goals not just more equitably than private markets, but more efficiently. Health care is perhaps the clearest, and certainly the most pressing, case. Public Medicare is enormously more efficient than its private counterparts, with far fewer administrative costs. The VA hospital system, with its efficiencies of scale, long-standing patient relationships, and comprehensive care, does a better and more cost-

effective job than its fragmented private sector counterparts. But in the health-care debate thus far, our market-oriented blinders have kept us from learning these lessons.

Now I want to turn to four specific realms in which I believe public investment could make a major difference, improving quality of life, helping people address significant problems, and boosting our economic performance.

The first is early childhood. I am thinking particularly of programs for children born into disadvantaging circumstances. Study after study has shown that investments in such programs have tremendously beneficial effects on the future possibilities of young lives; when we invest in early childhood, we invest in economic productivity, and we get a superior rate of return. The work of Nobel Prize-winning economist James Heckman shows that investment in early-childhood programs gives children a much larger chance to succeed. There are costs - to children and their families, and to the society at large – associated with learning difficulties, medical problems, truancy, and, of course, crime and involvement with the criminal justice system. All these costs can be significantly reduced through early-childhood investment. From a strict income-generating ability standpoint, according to Heckman, such programs can increase earnings by 15-17% for the children who receive them.

Another strong candidate for investment is in making college affordable. If we know anything, it is that education is increasingly a requirement for people to succeed in the workforce, and for our economy to compete in the global arena. Yet, a large number of

students are either avoiding post high school education altogether, or are graduating with enormously burdensome levels of college-related debt. According to recent studies, 168,000 academically qualified students don't attend college at all because they can't afford it; and financial considerations lead many others to choose two-year community colleges over four-year schools. This is in significant part a direct result of the declining investment in financial assistance. The Pell grant, which used to cover three-quarters of the costs of attending a public university, now covers only about one-third. Meanwhile, grants have largely been converted to loans, which are a much less helpful start. At the state level, public investment in higher education has been on a steady decline - a major reason for the rapidly increasing cost of tuition at state-supported schools. Since 1980, tuition at public four-year universities has more than doubled, after adjusting for inflation.

The third potential area of investment is in expanded national service. The benefits, I believe, would be manifold. A multi-faceted commitment, with new opportunities for service in such programs as Teach for America and the Peace Corps – and, more broadly, in social service and health care and environmental sustenance - could yield huge benefits for communities and people in need, both here and abroad. It could provide training and job-relevant experience for a cohort of young people coming into the job market. And it could engage a generation of youth eager to work for the common good, in ways that would last a lifetime. Neither private investment nor charities can or will meet these public needs at a scale that is possible and desirable. But public investment can, and should.

Finally - and this is an area of personal experience for me – I want to talk about making needed public investment in our democracy itself. Elections in this country have been run on a virtual shoestring, and we have paid a heavy price, in confusion and lost public confidence in our election system. The Help America Vote Act was a good step forward, but it was not enough and can't be viewed as a one-shot remedy. The patchwork of laws, rulings, and equipment-purchasing decisions - with private companies lobbying state-by-state and county-by-county for each of their secret technologies - has all of us on edge about procedural chaos every time a major election approaches, and has voters in different jurisdictions receiving different levels of access and security. We need a strong national agency, with serious investment in research, testing, standard-setting, training, and enforcement, to put American elections on a firm and high-functioning basis.

These are just a few of the policies that embody what public investment, applied to human capital and intellectual capital as well as to roads and bridges, can do. But what is even more important is that we work to rebuild an understanding public investment's role in our economy and in the lives of the people that the economy is intended to serve. We can no longer afford the luxury of under-investing in the public sector, while private investing soars and its returns accrue in such large numbers to so few.

Our nation's future, and that of its people, depends on a set of public structures that underpin the success of our businesses, our communities, and our citizens. Those structures—whether they are scientific research programs, levees, bridges, schools,

colleges, or children's programs— promote the common good and shape our common future. But they can only do their job if they are maintained and improved with public investment. We need to reverse the undervaluing of public investment and of government's overall role, and this committee's hearing today is an important part of that conversation. I thank you for allowing me to be a part of it.

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[i] Thomas Piketty and Emmanuel Saez, "The Evolution of Top Incomes: A Historical and International Perspective, American Economic Assn. Papers and Proceedings May 2006

[ii] U.S. Census Bureau, Historical Income Tables Households, Table H-2, http://www.census.gov/hhes/www/income/histinc/h02ar.html, accessed February 2007.

**Statement by Felix G. Rohatyn**
**to the**
**House Committee on Financial Services**
**United States House of Representatives**
**March 23, 2007**

Mr. Chairman, Members of the Committee,

It is a privilege to be here today to discuss a critical issue—the need for large-scale public investment in projects that will modernize our nation and enrich our people.

Throughout our history and until the 1960's, the Federal Government played a dominant role in our level of public investment while the states played a secondary role. This has changed since then. Public investment has, by tradition, meant infrastructure: roads, trains, bridges, public transportation, public schools, etc. have provided the private sector with the complementary investments which improve business productivity, our standard of living and our quality of life. Largely the product of a federal-state-local partnership, it was badly neglected over the years, principally by the failure of the Federal Government to maintain its level of participation.

The American Society of Civil Engineers has estimated that it would take one trillion six hundred billion dollars, over a five-year period, to bring America's infrastructure to a reasonable standard of adequacy and that this requirement increases by about $300 billion every two years.

Mr. Chairman, I have for many years recognized our government's historic role as the indispensable investor in the economy of our country. I hope that your support will encourage the Congress to undertake the major effort needed in rebuilding America before it is too late. In order to do so we must counteract the present theology that all public investment is wasteful, and that neither taxes nor borrowing can be justified for

that purpose. It also is worth noting that the financing of public infrastructure creates hundreds of thousands of private sector jobs; this is particularly important when globalization is putting pressure on American industrial employment.

Fortunately, past American political leaders did not always think this way. As we look to our nation's future, we also should look back at the history of great public investments—at the precedents set by leaders who made many of the critical commitments that became the backbone of our nation. We should reflect on the actions of those leaders who used government power and public finance to make the investments that formed this country. And we should celebrate their historic achievements by continuing to invest boldly and wisely in America's future.

As the political, geographic and economic structure of America took shape in the nineteenth and early twentieth centuries, public investments such as the Louisiana Purchase, the Erie Canal, the Transcontinental Railroad, the RFC and the Interstate Highway System shaped our economy and our security structure. Although the private sector has been the mainstay of our economy, it could not exist without this platform and the political leaders who made those decisions—Jefferson, DeWitt Clinton, Lincoln, FDR and Eisenhower.

Since the beginning of the Republic, transportation, infrastructure and education have played a central role in advancing the American economy: whether it was the canals in upstate New York or the railroads that linked our heartland to our industrial centers; whether it was the opening of education to average Americans by land grant colleges and the GI Bill making education basic to American life; or whether it was the interstate highway system that ultimately connected all regions of the nation. This did

not happen by chance but was the result of major investments financed by the federal and state governments over the last century and a half. Mr. Chairman, we need to make similar investments now.

Of course, not all government investments have been successful. The endless earmarks, political "pork" in too many projects and corruption in military contracts, the reoccurring problems of NASA and many others, are proof that there is no such thing as perfection in the public sector any more than in the private sector. But the private sector has also had its Enrons and its Worldcoms, as well as its earlier scandals which caused Teddy Roosevelt to break up the trusts and FDR to regulate the securities markets. But the consistent ideological attack on public investment is bringing the country to its knees. Witness the outrage of New Orleans. Witness the state of our public schools. Witness our pollution and our wasteful use of energy. Without adequate levels of public investments, our private sector will lose much of its competitiveness and outsource more and more of our requirements in goods as well as services, constantly increasing our foreign debt and losing domestic jobs. The recent decades have been the best of times for private investment; for public investment, they have been disastrous.

My views on economic and social issues have been shaped not only by my years in business and in government, but also by my experiences as a child and as a refugee, fleeing from the Nazis and seeking asylum in America during WWII In 1942, we arrived in America; I was 14 years old. During the war years I had, from time to time, heard FDR's voice on the radio, sometimes on clandestine sets, which shaped, almost by osmosis, my views of America. To me, America was the platform for freedom, fairness and opportunity, and I have never wavered from those views.

My involvement in public life began In the spring of 1975, when for reasons too numerous to list here, New York City was caught in a financial death spiral. In the 1960's the City had lost 300,000 private sector jobs that had been replaced by an equivalent number of public-sector employees, together with the sharply-increasing budgetary costs that it entailed. In the early 1970's, the City's economy had slowed sharply during a national recession aggravated by the Arab oil embargo; our capital investment program had been wiped out, the City was shut out of the capital markets and headed for bankruptcy. To regain market access we needed a plan which would revive the City's economy, eliminate its operating deficit and revive its moribund capital investment program. We needed a plan, with Federal backing.

In the summer of 1975, when Governor Hugh Carey appointed me Chairman of New York's Municipal Assistance Corporation, I believed that bringing the City back to the market would take a few months; it actually took several years and required the courageous political leadership of Governor Carey and Mayor Ed Koch; the strong support of the City's labor unions and its banks; and ultimately, it required credit from the Federal government in the form of seasonal loans. The Federal Credit support enabled the union pension funds and the private financial institutions to bring their own support to the financing of the city and as a result, the City balanced its budget over the next four years, reentered the financial markets and, for the next 20 years (with the exception of the recession after 9/11/2001) the City's economy was strong, its budgets were balanced and it was able to make the necessary investments in its infrastructure. It was also able to regain its global attraction for business and for tourism, while surviving the tragedy of 9/11. It could not have happened without the credit support of

the Federal government and the sacrifices of its citizens. It is worth noting that the city repaid 100% of the principal and interest owed to the Federal government ahead of schedule, and that the Federal government did not have to face the staggering national cost of a New York City bankruptcy.

Today, support for any government intervention in the economy has become anathema and this has frightened too many Americans into ignoring the long and positive history of government investment in our land. Furthermore, the illogical rules of government accounting and the fear of further deficits make this a very difficult political issue. As opposed to businesses, states and local governments, the Federal Government accounts do not differentiate between long-term investment and everyday operating expenses. They treat construction of a dam as if it were a welfare check and record the debt incurred as a deficit, without the offsetting asset represented by the dam. If our private sector companies were to keep their books in this fashion, they would report losses instead of profits, they would cut back in investment and employment in order to show fictitious earnings, and would ultimately go out of business.

The idea that government intervention in the economy is always bad has had consequences. The recent catastrophe of New Orleans was an event waiting to happen. If not in New Orleans, it would have happened somewhere else. It is the result of a national failure to make public investments adequately and intelligently—in the case of New Orleans inadequate investment necessary to prevent the flooding of New Orleans, and the failure to have in place an effective emergency response system.

Modern market capitalism and the links of the financial markets to advanced information technology have created a formidable engine for the creation of wealth and we have, in my judgment, the best economic system in the world. This wealth, however, is heavily weighted toward the private sector and has resulted in the neglect and the decay of public facilities, including that of our public schools. The sensitivity of the financial markets to government spending became a powerful brake on public investment because the arbiter of financial policy is a government accounting system that treats investment as an expense and a bond market fearful of deficits regardless of their origins.

The combination of these notions, namely that government cannot do anything right and that long-term public investments are the equivalent of welfare payments, has caused a steady erosion in federal funding for infrastructure and other initiatives that would spur progress and economic growth, leaving more and more to state and local governments which cannot provide adequate support. That is the road that led to New Orleans.

As we fail to make large public investments in our nation's future, the rest of the world is rapidly catching up with us. For example, China has announced an ambitious railway modernization plan increasing their national track network to 62,000 miles and dedicated high-speed passenger lines to 7,400 miles. They plan to spend about $200 billion in the next five years for rails, equipment and rolling stock. China is equally aggressive in its projected investment in nuclear power as well as in bridges, roads and airports. With foreign exchange reserves of over $1 trillion and continued surpluses for the foreseeable future, China will have capacity of massive investment which may make

her the leader in the world in nuclear power, civil aviation, highway construction and railroads and, most importantly, education. China is not alone in this; India is not far behind.

A federal capital budget would help correct our problem. You all know the political hurdles facing the passage of such a budget, but their existence should not automatically doom the idea. After all, all fifty states have capital budgets, as do most responsible governments, and it may be time to insist on similar fiscal responsibility in Washington. If, in the end, we are unable to institute a capital budget, there is a recent development that suggests another remedy: the return of the 30-year Treasury bond. Long-term bonds should finance capital assets and their issuance should be dedicated to that purpose. Even longer maturities than 30 years can be envisaged; corporations and governments are issuing up to 50-year bonds. The European Union, for instance, finances its superb high-speed rail network with the European Investment Bank's long-term bonds.

To help deal with our shortage of capital investment, the Congress could authorize a trust fund, to be financed over a five-year period by special purpose 50-year Treasury bonds. The fund could be used to co-finance high priority national, regional and local tangible infrastructure programs, as well as special projects which generate advanced intellectual property. Private capital should be an integral part of the program. Tight outside controls should be applied to the operations of the fund, and it should be subject to the federal debt limit.

Jefferson, Lincoln, FDR and Eisenhower proved that public investment can generate vast returns. The federal budget should be a tool to encourage such national

investment instead of writing it off. As you may know, Mr. Chairman, Senator Warren Rudman and I co-chair a commission at the Center for Strategic and International Studies that has been working with members of the House and Senate from both parties on these ideas in which Senators Dodd and Hagel are heavily involved. We are hopeful that we will see some movement in this Congress.

Mr. Chairman, all of us who believe in the importance of public sector investment appreciate your leadership here. Our elected representatives can continue in the footsteps of great American leaders by adopting a different perspective of our national wealth and how to increase it—it is an issue that should be debated in this Congress and throughout the country.

Thank you very much. I would be happy to answer any questions that you might have.

# PUBLIC PRODUCTION:

# GOVERNMENT FAILURE VERSUS MARKET FAILURE

Statement of

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Committee on Financial Services
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*The views expressed here are those of the author and should not be attributed to the trustees, officers, or staff members of the Brookings Institution.

**The Economic Questions**

Every year federal and state governments attempt to promote economic growth by investing hundred of billions of dollars in the nation's physical capital stock—roads, airports, urban rail systems, and the like—and in the nation's human capital. Investments in the latter include education and R&D subsidies.

My testimony will focus on the following questions: What is the economic justification for public as opposed to private investment in these areas? Are these investments efficient? How can these investments be improved?

**The Justification for Government Intervention**

In theory, government intervention in economic life is justified to stabilize the macroeconomy, correct market failures such as monopoly and externalities, and to pursue social goals such as reducing poverty and ensuring fairness in the labor market.

How does public investment fit into these justifications? Generally, a private firm will provide a good or service if it can earn a normal profit. Market failure occurs when a socially desirable good or service—that is, a good or service whose social benefits exceed its social costs—is not provided because firms would find it unprofitable to do so. For example, when the nation was developing its road system, a private firm or firms may not have been able to raise sufficient capital (let alone repay the accumulated debt) to build a private interstate highway system. Similarly, a private urban rail system may not be able to attract sufficient ridership and charge sufficiently high fares to be profitable. In such cases, the government can increase economic welfare by financing socially desirable services like roads and public transit that would not be supplied by the private sector. Thus *public production* of these activities is correcting a market failure.

Another area of market failure occurs when firms' R&D creates positive spillovers to their actual or potential competitors. Innovative effort may therefore be suboptimal because knowledge can be transmitted from its creator to prospective competitors at low cost. The federal government has tried to spur innovation—and correct another potential source of market failure—by establishing the patent system and subsidizing firms through direct funding, tax credits, and competitions.

In contrast to the preceding forms of public investment, the justification for government intervention to promote human capital is not completely clear. For example, it could be argued that education subsidies may generate a positive externality by raising the skills of the nation's workforce or by correcting possible failures in capital markets (e.g., student loans). But it could also be argued that the subsidies seek to accomplish a social goal of providing a merit good—that is, goods or services that American society believes every citizen is entitled to regardless of whether he or she can afford them. A public education, social insurance, protection from criminals, and the like are considered to be merit goods.

In the remainder of my testimony, I will focus on production and financing of public infrastructure and public services because I have conducted research is this area. A summary of the effects of government efforts to spur innovation is contained in chapter 4 of my book, *Government Failure Versus Market Failure*, which can be freely downloaded from my website. Most scholarly assessments of education subsidies have primarily evaluated them on the grounds of whether they are achieving a social goal in an efficient manner rather than whether they are efficiently correcting a potential market failure. A common theme in the literature is that subsidies for college education often go to households whose children would go to college anyway without these subsidies.

**An Assessment of Public Production**

Before assessing public production, it would be desirable to determine whether private production is feasible and, if so, whether it would generate greater net benefits to society than public production. However, economists have generally not taken this approach.

Instead, economists have taken public production as given and explored whether the government's pricing, investment, and operating policies are maximizing economic efficiency. Generally, this is accomplished when the government sets efficient (cost-based) user charges for public facilities and finances investments up to the point where marginal benefits are equal to marginal costs. Of course, the public sector may not perfectly allocate resources in accordance with optimal pricing and investment but still improve upon the private sector's provision.

Theoretical guidelines are useful for suggesting public policies to correct market failures, but the effect of public production on economic welfare can be assessed only with empirical evidence. I will summarize empirical evidence on the efficacy of public production from studies noted in chapter 5 of *Government Failure Versus Market Failure*, which is appended to this testimony.

Simple descriptive measures indicate that the nation's public infrastructure and services are beset with economic problems including growing highway congestion and delays in major metropolitan areas, growing congestion and delays in air travel, and growing operating and capital deficits in public bus and rail transit. The summary findings I draw from the available scholarly evidence are:

> Public financing and management of transportation infrastructure, public lands, and various services have been extremely inefficient and have strained the budgets of all levels of government.

*Pricing and investment inefficiencies*. The primary sources of the inefficiencies are prices that do not accurately reflect the cost of service and investments that waste resources.

Road Pricing: Highway expenditures are primarily financed by state and federal gasoline taxes. But the gas tax is highly inefficient because it hardly varies by time of day and by

stretch of road in a given metropolitan area. Thus it does not discourage cars and trucks from traveling during peak periods on major thoroughfares which contributes to congestion. In addition, the gas tax does not discourage heavy trucks from damaging the roads. Road damage is related to roughly the third power of a truck's weight per axle, indicating that for a given load trucks with more axles do *less* damage to the road than trucks with fewer axles. But the gas tax provides perverse economic incentives for truckers to reduce road damage because trucks that operate with more axles get lower fuel economy and pay higher gasoline taxes.

Road Investment: Roads eventually wear out unless they are repaved. Investments to keep roads durable trade off the costs of maintaining current pavement against the capital costs of building thicker pavement, which is less costly to maintain. Optimal investments minimize the sum of maintenance and capital costs. Generally, highway authorities have not minimized investment costs because they have built thinner pavements to reduce up-front capital costs. Road users are also affected by suboptimal road design because they must drive slower on roads in poor condition.

Airport Pricing: The principal cost that an aircraft incurs when it lands and takes off is the delay that it imposes on other aircraft. Current runway landing fees are based on an aircraft's weight subject to guidelines set by the Federal Aviation Administration. However, congestion at a given airport varies by time of day in accordance with the volume of aircraft traffic. Aircraft weight has little effect on congestion because a plane weighting to take off or land is delayed roughly the same amount of time by a jumbo jet as by a small private plane; thus, weight-based landing fees bear little relationship to airport congestion.

Airport Investment: New runways can substantially reduce air travel delays. But runway construction and expansion face formidable political and bureaucratic obstacles, as indicated by the five- to ten-year average delay to add runway capacity at major congested airports. Indeed, only three runways were built during the 1980s and six during the 1990s. Twelve runways have been built during this decade but some have been more than twenty years in the making.

Waterway Investment: Inland waterways are used by water freight carriers to transport bulk commodities and low-value bulk goods. The Bureau of Reclamation and the Army Corps of Engineers are responsible for building and rehabilitating the waterways. Among the inefficiencies that have been identified in public investment in waterways are that benefit-cost ratios of Army Corps' projects are consistently and unequivocally below one, the Corps' has adjusted cost-benefit calculations to justify projects, and concerns that the there will be substantial cost overruns in the Corps' management of the Florida everglades project.

Public transit pricing: State and local governments are responsible for managing and providing most of the bus and rail transit in U.S. metropolitan areas. Transit operations and investments are funded by farebox revenues and federal, state, and local subsidies. Transit fares are significantly below the marginal cost of transit service and have failed to

keep up with rising operating and capital costs. The operating and capital subsidies that make up this shortfall currently exceed $20 billion.

Public transit investment: Investments are made to expand bus routes and frequency and to build new urban rail systems and expand routes of existing systems. The investments appear to be excessive because transit use is low. Rail fills only 18 percent of its seats with paying passengers throughout the day, and transit buses fill only 14 percent (loads are somewhat higher during the morning and evening rush hour). The desirability of building new urban rail systems seems questionable because the benefits generated by almost all systems—including benefits to users and the reduction in road congestion—are exceeded by the required subsidies to close deficits. Rail transit has been unable to attract sufficient patronage to reduce its high average costs—a problem that has been complicated enormously by new patterns of urban development with geographically dispersed residences and jobs.

Amtrak Service: The National Railroad Passenger Corporation (popularly known as Amtrak) provides intercity passenger rail transportation. Formed in 1970 because private railroads no longer wanted to provide this service, Amtrak was expected to be self-sufficient within a few years of its inception and to operate without subsidies. But it has continued to rely on subsidies to provide service. Recently, subsidies have made up 20-30 percent of its revenues. The subsidies would be justified if they were exceeded by Amtrak's social benefits. But it appears that with the exception of the Northeast corridor, Amtrak is not socially desirable in many parts of the country.

US Postal Service Pricing: The United States Postal Service is the nation's largest public enterprise. The postal system was intended to be financially self-sufficient, but its recent annual losses amount to more than $1 billion. Prices for first-class mail—which is falling as people substitute to Internet-based communications—are above marginal costs and are used to partly subsidize prices for second-, third-, and fourth-class mail, which are below marginal costs. The postal service also uses outdated, labor-intensive technologies that not only inflate costs but result in slower mail delivery times than optimal.

*Summary*. The costs of inefficient pricing and investment policies for public infrastructure and services continue to grow with current estimates exceeding $100 billion annually. In fact, these costs understate the full costs of inefficient public production because they do not include X-inefficiencies—that is, the inflated costs of providing services in the public sector. A classic example is the Davis-Bacon Act, which requires that private contractors who undertake various road projects must be paid union wages that are applicable to the jurisdiction where the work takes place. It has been estimated that such inflated wages cost the federal government at least $1.5 billion annually. The inefficiencies in public production are reflected in slower productivity growth. For example, it has been estimated that the annual returns from highway investments have fallen from 17 percent during the 1970s to less than 5 percent during the 1980s and 1990s.

**Policy Recommendations**

Common explanations for the inefficiencies of public production focus on the political pressure exerted by interest groups who benefit from the current state of affairs and the inflexibility and limited vision of federal agencies. To be sure, the federal government has recently indicated its support for public private partnerships and its interest in congestion pricing experiments that could lead to improvements in efficiency.

However, my view is that more significant institutional change in the form of privatizing public facilities and services will be necessary to dramatically improve efficiency and spur growth. Increasing concerns about the waste associated with public financing of vital social services is motivating interest in whether the private sector could do a better job than the public sector is currently doing to finance and offer these services. In theory, privatization would enable private firms to operate in a competitive environment without bureaucratic controls and political pressures. Private firms would have a financial incentive to reduce existing inefficiencies, introduce innovative services, and respond to users' preferences.

Of course, empirical evidence is necessary to strengthen the case that privatization would lead to improvements in social welfare over public provision. Accordingly, I believe it is essential to obtain hard evidence from experiments about privatization's likely economic effects. Hopefully, members of Congress will be persuaded of the importance of such experiments and we can begin the task of carefully designing selected experiments to learn whether, in fact, privatization can overcome the inefficiencies of public production, which are increasingly becoming a drag on the nation's economic growth.

# Government Failure versus Market Failure

## Microeconomics Policy Research and Government Performance

Clifford Winston

AEI-Brookings Joint Center for Regulatory Studies

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# 1 Introduction

The Aim of Science is not to open the door to infinite wisdom, but to set a limit to infinite error.

BERTOLT BRECHT

Shortly after he took office, President George W. Bush nominated Harvard professor John D. Graham to head the Office of Information and Regulatory Affairs within the Office of Management and Budget. Graham was known to be a strong advocate of using cost-benefit analysis to assess and reform environmental, health, and safety regulation. If, for example, the Environmental Protection Agency (EPA) proposed a regulation that saved 100 lives but at a cost of $1 billion per life, Graham would oppose the regulation and encourage the EPA to craft an alternative that could save these lives at a much lower cost that was aligned with conventional estimates of the "value of life." Or if the National Highway and Traffic Safety Administration (NHTSA) proposed a regulation that forced automakers to adopt a specific technology to reduce fuel consumption but the resulting benefits were less than the increased costs to automakers of implementing the technology, Graham would oppose the regulation on the grounds that its social net benefits were negative.

To an economist, these positions are eminently reasonable. But some commentators and policymakers are outright dismissive of policy assessments based on cost-benefit analysis, apparently willing to substitute good intentions—or their own political agenda—for analysis. Indeed, Senator Dick Durbin's response to Graham's nomination was an op-ed in the *Washington Post* on July 16, 2001, entitled "Graham Flunks the Cost-Benefit Test," while Georgetown University law professor Liza Heinzerling expressed her views in the *Los Angeles Times* on July 19, 2001, with an op-ed entitled "Don't Put the Fox in Charge of the Hens."

Such refusals to acknowledge that government interventions can have costs as well as benefits raise a fundamental concern about whether U.S. government policy is truly enhancing microeconomic efficiency—that is, the degree to which our economic system meets the material wants, as measured by quantity and quality, of its members. Microeconomic efficiency, or Pareto optimality, is achieved when it is impossible to make one person better off without making someone else worse off. In theory, government policy seeks to improve microeconomic efficiency by correcting a market failure, defined by Bator (1958) as the failure of a system of price-market institutions to stop "undesirable" activities, where the desirability of an activity is evaluated relative to some explicit economic welfare maximization problem. Accordingly, a market failure can be defined as an equilibrium allocation of resources that is not Pareto optimal—the potential causes of which may be market power, natural monopoly, imperfect information, externalities, or public goods.

On what basis is one to conclude that a policy to correct a market failure is as successful as possible? The first consideration is whether government has any reason to intervene in a market: Is there evidence of a serious market failure to correct? The second is whether government policy is at least improving market performance: Is it reducing the economic inefficiency, or "deadweight" loss, from market failure? Of course, the policy could be an "expensive" success by generating benefits that exceed costs, but incurring excessive costs to obtain the benefits. Hence, the final consideration is whether government policy is optimal: Is it efficiently correcting the market failure and maximizing economic welfare?

*Government* failure, then, arises when government has created inefficiencies because it should not have intervened in the first place or when it

could have solved a given problem or set of problems more efficiently, that is, by generating greater net benefits. In other words, the theoretical benchmark of Pareto optimality could be used to assess government performance just as it is used to assess market performance. Of course, the ideal of a completely efficient market is rarely, if ever, observed in practice. From a policy perspective, market failure should be a matter of concern when market performance significantly deviates from the appropriate efficiency benchmark. Similarly, a government failure should call a government intervention into question when economic welfare is actually reduced or when resources are allocated in a manner that significantly deviates from an appropriate efficiency benchmark.

Economic theory can suggest optimal public policies to correct market failures, but the effect of government's market failure policies on economic welfare can be assessed only with *empirical evidence*. For more than a century, the primary market failure policies implemented by government have included antitrust policy and economic regulation to curb market power, so-called social regulatory policies to address imperfect information and externalities, and public financing of socially desirable services that the private sector would not provide. Initially, economists assessed these policies on conceptual grounds, culminating in Friedman's (1962) classic attack questioning government's role in almost all areas of economic life. Schultze (1977) was one of the first to systematically raise doubts about the effectiveness of government policies based on the limited empirical evidence that was available. Wolf (1979) introduced the term nonmarket failure to indicate some type of government failure and suggested that government failure may be of the same order of importance as market failure.

An additional thirty years of empirical evidence on the efficacy of market failure policies initiated primarily by the federal government, but also by the states, suggests that the welfare cost of government failure may be considerably greater than that of market failure. More specifically, the evidence suggests that policymakers have attempted to correct market failures with policies designed to affect either consumer or firm behavior, or both, or to allocate resources. Some policies have forced the U.S. economy to incur costs in situations where no serious market failure exists, while others, in situations where costly market failures do exist, could have improved resource allocation in a much more efficient manner.

Government failures appear to be explained by the self-correcting nature of some market failures, which makes government intervention unnecessary; by the short-sightedness, inflexibility, and conflicting policies of government agencies; and by political forces that allow well-defined interest groups to influence elected and unelected officials to initiate and maintain inefficient policies that enable the interest groups to accrue economic rents.

My negative assessment is not intended to suggest that all microeconomic policies are ineffective or to spur defenders of an active government to search for evidence of policies that work. My objective is to focus attention on how current policy, in broad terms, can be improved. This is not a futile exercise because in the past few decades government has become somewhat less inclined to pursue inefficient policies and has initiated some beneficial reforms. For example, U.S. policymakers are less likely today than they once were to try to correct a perceived market imperfection by instituting (counterproductive) price regulations such as milk price supports or oil price controls. Similarly, in some cases policymakers have enhanced economic welfare by withdrawing their market failure policy in favor of a market solution (for example, economic deregulation) and by designing a framework that makes effective use of market forces to reduce the inefficiencies caused by a market failure (for example, well-designed emissions trading programs). Further applications of and experiments with market-oriented policies to address externalities and public financing of socially desirable activities are likely to reveal that such policies are far superior to current policies at remedying market failures in an efficient manner.

Although researchers have identified serious flaws in other market failure policies, such as antitrust, patents, and certain information policies, the profession's empirical knowledge is too limited to permit confident suggestions about how policy in these areas can be significantly improved. Thus, additional research is clearly needed to help guide the formulation of appropriate policy in these areas.

Although my assessment and policy recommendations are based on a broad and thorough synthesis of the available empirical evidence on the economic effects of market failure policies, it is vital for the economics policy community—including researchers and policymakers—to continue the task of accumulating, building, and drawing on this evidence so that future policy debates do not have to begin from "square one." Over the past few decades, the profession has begun to understand which policies have been

successful and which have not, as well as why policymakers fail to pursue socially desirable reforms. The gap between the plethora of policies recommended by economists to correct market failure and mitigate government failure and the policies the government has pursued should only encourage—not discourage—the profession's efforts to assemble and disseminate a useful empirical base of knowledge about the performance of government's microeconomic policies. In isolated instances, public officials have shown the capacity to learn from economic research and improve their policies. A more comprehensive body of evidence should lead to much-better-informed action and, more broadly, to socially desirable outcomes.

The disappointing outcome of government's current microeconomic policies should be of great concern to everyone interested in public affairs regardless of political persuasion or occupation. By documenting government's performance and indicating how it can be improved, I hope to do more than set a "limit to infinite error."

# 5 Public Production

A private firm will provide a good or service if it can earn a normal profit. Market failure occurs when a socially desirable service (that is, one whose social benefits exceed social costs) is not privately offered because it is unprofitable. Market failure also occurs when a service is undersupplied because it is a public good and susceptible to the free rider problem. A pure public good—defense and fresh air are probably the only examples—is nonrivalrous (nobody's consumption lowers anybody else's benefits) and nonexcludable (it is infeasible to prevent those who do not pay for the good from obtaining benefits). Most publicly supplied services are mixed or "impure" public goods such as roads—consumption is rivalrous during congested periods but exclusion may be difficult.

The government can increase social welfare by financing socially desirable services, including public goods, which would not be supplied by the private sector. In practice, the government can provide the service or negotiate a contract with a private firm to provide the service. In any case, the government can maximize social welfare by setting efficient user charges for public facilities and by financing investments in the facilities that equate marginal benefits and marginal costs.[1] The facilities requiring the largest investments constitute the nation's physical infrastructure.

1. Efficient user charges amount to marginal cost pricing. If production is characterized by large scale economies, then efficiency calls for marginal cost pricing with subsidy because marginal costs are below average costs. If no subsidies are available, efficiency calls for Ramsey prices, where the percentage markup

The federal government, sometimes in collaboration with state and local governments, is responsible for financing and managing highways, airports, air traffic control, inland waterways, public land, urban transit, intercity passenger rail, and mail services.[2] As noted, the theoretical rationale for public financing of major infrastructure and certain services is that the private sector would find it unprofitable to do so. In general, economists have not tried to determine whether private production is feasible and, if so, whether it would generate greater net benefits than public production. Instead, researchers have taken federal, state, and local government control over more than $1 trillion of the nation's physical capital as given and investigated whether pricing, investment, and operating policies are maximizing economic welfare. Of course, the public sector may fall short of allocating resources in accordance with optimal pricing and investment policies but nonetheless improve on what the private sector's provision, if any, would have been. However, growing concerns with the waste associated with public financing of important social services is raising questions about whether such provision is better than allowing the private sector to finance and offer these services.[3]

Descriptive measures indicate that some of the nation's public infrastructure and services are beset with economic problems. The speed and reliability of automobile travel has been increasingly compromised by congestion and delays in major metropolitan areas (figure 5-1); delays in air travel that were temporarily curtailed by the September 11 terrorist attacks are as great as ever (figure 5-2); and public transit's operating deficits are a growing drain on the public purse (figure 5-3) during a period when its patronage has declined. Transit's total deficits are even greater than shown because it also receives substantial capital subsidies. The summary findings that I draw from the current state of the available scholarly evidence are:

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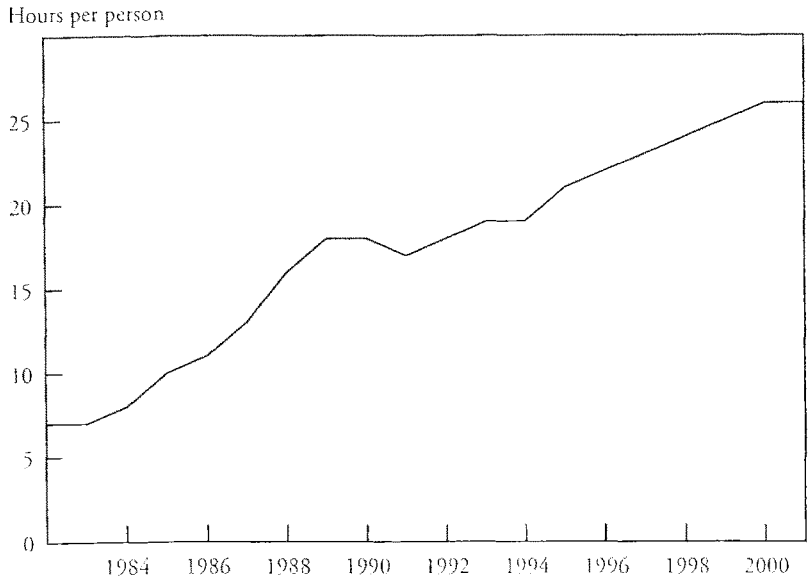
of prices above marginal costs is inversely related to users' demand elasticities subject to a break-even constraint. Empirical work indicates that marginal cost pricing without subsidy is a feasible benchmark for the facilities and services assessed here.

2. Government is also responsible for building and maintaining dams and sewers and for public water and power agencies. I am not aware of recent scholarly economic assessments of government's provision of this infrastructure. Schultze (1977) discusses the cost inefficiencies associated with federal grants to aid construction of municipal waste treatment plants.

3. Government has used market mechanisms to allocate some public goods such as the electromagnetic spectrum. I discuss these experiments later.

Figure 5-1. *Average Annual Traffic Delay in Major Metropolitan Areas, 1982–2001*



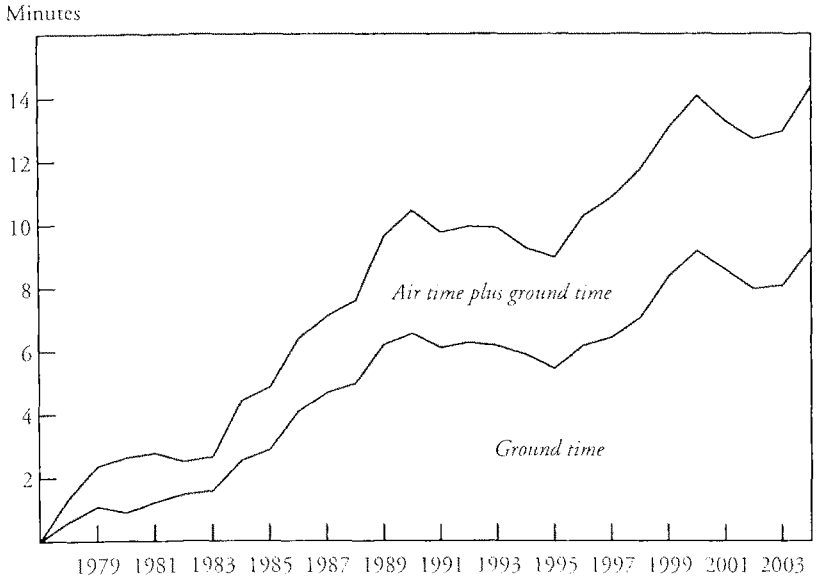

Source: Texas Transportation Institute.

Public financing and management of transportation infrastructure, public lands, and various services have been extremely inefficient and have strained the budgets of all levels of government.

## Transportation Infrastructure and Public Lands

Federal, state, and local governments are responsible for building, maintaining, and rehabilitating U.S. highways. Valued at more than $1 trillion, the nation's road system is its largest civilian investment, according to the Bureau of Economic Analysis. Highway expenditures are primarily financed by state and federal gasoline taxes. These taxes are also generally the only "price" that vehicles must pay for using the road system. State and federal governments hire private contractors to undertake various road projects such as rehabilitation and major construction. In accordance with the

Figure 5-2. *Changes in Air Travel Time, 1977–2004*

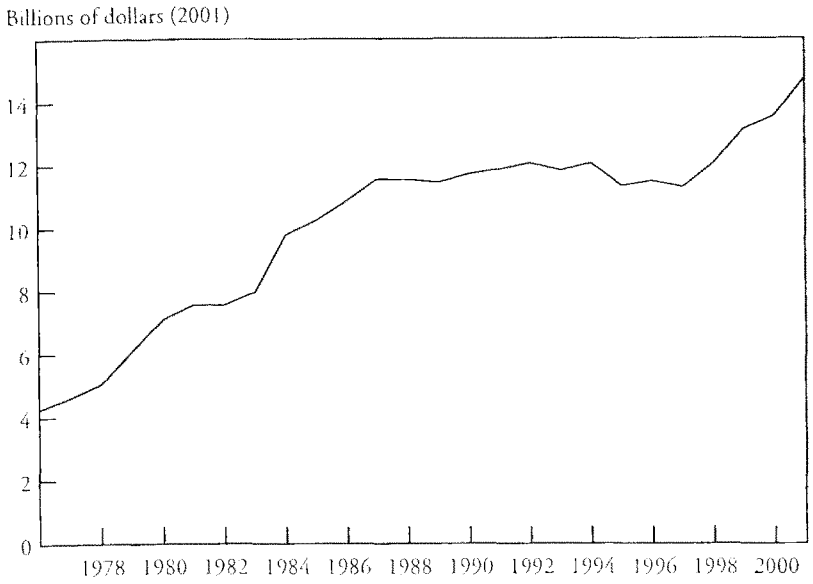



Source: U.S. Department of Transportation, Service Segment Data and Schedule T-100, Data Bank 28DS, Domestic Segment Data.

Davis-Bacon Act, these contractors must be paid union wages that are applicable to the jurisdiction where the work takes place.

Public management of roads is characterized by substantial pricing, investment, and production inefficiencies (these issues are discussed in Small, Winston, and Evans 1989). Roads are built to a given capacity (lane miles) to accommodate cars and trucks, and to a given durability (pavement thickness) to accommodate heavy trucks. All vehicles contribute to congestion, which occurs mainly during peak commuting periods when the ratio of traffic volume to capacity exceeds a certain threshold, forcing vehicles to travel at less than free-flow speeds allowed by law. Heavy trucks increase the frequency that road pavement must be resurfaced; pavement wear itself is related to roughly the third power of a truck's weight per axle. Given these considerations, gasoline taxes are an inefficient pricing mechanism because they are basically invariant to changes in traffic volume throughout the day and are *inversely* related to a truck's weight per axle

Figure 5-3. *Government Transit Operating Assistance, 1976–2001*




Source: American Public Transit Association, *Transit Fact Book* (1992, 1998) (www.apta.com).

(that is, trucks with more axles that reduce pavement damage get lower fuel economy and pay higher gasoline taxes).

Investments in highway durability must trade off the maintenance costs of current pavement against the capital costs of building thicker pavement; optimal investments minimize the sum of these costs. Generally, highway authorities have failed to minimize investment costs because they have preferred to build thinner pavements to reduce the up-front capital costs. Consequently, all roads, from local thoroughfares to major interstates, experience excessive maintenance costs because they must be repaved sooner than if they were built to optimal (thicker) standards. In addition, the speed and reliability of highway transportation have been adversely affected by the growing share of freeways and arterials in fair or worse condition over the past twenty years.

Highway spending has also been used to expand highway capacity and repair roads in well-traveled areas to reduce congestion. But Winston and Langer (2006) found that, on average, one dollar of spending in a given

year reduces the congestion costs to road users by only eleven cents in that year and only a few cents in subsequent years. The efficacy of highway expenditures is compromised by the lack of an explicit mechanism that links such spending with congestion in specific localities. But the most fundamental obstacle to highway spending that could efficiently reduce congestion is that the U.S. road system is largely complete and the nation's urbanized areas have little available land to expand their infrastructure.

Finally, highway production costs are inflated by bureaucratic rules that make it difficult to use the latest and most efficient production technologies and by Davis-Bacon constraints that prevent highway authorities from hiring and paying workers who would be willing to work for lower wages than the prevailing union rate.

Small, Winston, and Evans (1989) estimated that replacing gasoline taxes with marginal cost congestion tolls and pavement-wear taxes and building roads to optimal pavement thickness would generate an annual welfare gain of $23.9 billion. Congestion tolls that vary by time of day and location would reduce delays and make efficient use of scarce road capacity. In addition, efficient highway tolls, which reduce excessive driving during peak periods, would justify a substantial reduction in (inefficient) highway expenditures. Such tolls can also be adjusted to account for possible political objections to reducing the welfare of low-income motorists, who place less value on travel time savings than high-income motorists do, without sacrificing much of the gains in efficiency (Small, Winston, and Yan 2006). Marginal cost pavement-wear taxes that are based on a truck's weight per axle and vary by road type would encourage truckers to shift to vehicles with more axles that do less damage to the roads.

Improving highway production efficiency would significantly add to these gains. For example, Kessler and Katz (2001) estimate that the Davis-Bacon Act costs the federal government some $1.5 billion annually. This figure does not simply represent a transfer to labor because no market failure is being corrected, while inflated wages must be financed by additional tax revenues, which creates an additional inefficiency.

Responsibility for designing and operating airports lies primarily with local governments. Airport expenses are covered by passenger facility charges and landing fees, which are set by local airport authorities based on an aircraft's weight subject to guidelines set by the Federal Aviation Administration. Airports that seek federal assistance for investments, such as

building a new runway or lengthening an existing one, must receive FAA approval and satisfy the EPA's environmental impact review.

Congestion at a given airport varies by time of day in accordance with the volume of aircraft traffic. Aircraft weight has little effect on congestion because a plane waiting to take off or land is delayed roughly the same amount of time by a jumbo jet as by a small private plane; thus, weight-based landing fees bear little relationship to airport congestion. Runway construction and expansion face formidable political and bureaucratic obstacles, as indicated by the five- to ten-year average delay to add runway capacity. Unfortunately, the FAA has done little to expedite the review process. Indeed, since the mid-1990s only a handful of new runways have been put into service at the most congested airports. Morrison and Winston (1989) estimated that replacing weight-based landing fees with marginal cost takeoff and landing tolls and adding runways at congested airports to maximize net benefits would generate an annual welfare gain of $18 billion. As in the case of highway pricing, airport congestion tolls that vary by location and time of day would make efficient use of scarce runway capacity.[4]

The U.S. air traffic control system monitors domestic airspace to ensure safety and reduce delay. The FAA is responsible for hiring air traffic control personnel and for supplying facilities with new equipment. The FAA has been sharply criticized by commercial airlines and Congress for its tardiness in procuring and implementing up-to-date technology that could expand runway and airspace capacity. In addition, Morrison and Winston (2005) argued that political influences cause the FAA to allocate its resources inefficiently. They found that a reallocation of FAA expenditures toward airports that experience the greatest delays would generate more than $1 billion in annual time savings to air travelers and cost savings to airlines.

Inland waterways are used by water freight carriers to transport bulk commodities and low-value goods. The Bureau of Reclamation and the Army Corps of Engineers are responsible for building and rehabilitating the waterways. In 1952 Senator Paul Douglas, an economist by profession,

4. Recent research implies that the benefits of congestion pricing at airports dominated by a single commercial airline carrier are smaller than believed because the hub-dominant carrier internalizes congestion that it causes itself and because a hubbing carrier does not operate at the same times of day as nonhubbing carriers do (Brueckner 2002; Mayer and Sinai 2003). Morrison and Winston (2005), however, found that these considerations, while valid, only modestly reduce benefits from congestion pricing because the bulk of the welfare cost of delays is attributable to operations by commercial and commuter carriers and general aviation that do not internalize delay.

pointed out that waterway projects were often fundamentally flawed on economic grounds because the Corps tended to overstate benefits and greatly underestimate costs.

To the best of my knowledge, scholars have not recently assessed the social desirability of waterway projects, but such projects have attracted considerable media scrutiny because of wasteful investments attributable to powerful political interests. For example, after the Corps was forced to delay its seven-year study of major construction projects on the Mississippi River because an independent economic assessment determined that the study's forecasts of barge traffic were inflated, Senator Christopher Bond of Missouri vowed to make sure that projects were funded no matter what the economic studies concluded.[5]

Beginning with a series of articles that ran in 2000 in the *Washington Post*, Michael Grunwald has reported the most egregious examples of the Army Corps' inefficiencies. Although this information does not constitute scholarly evidence, it may someday provide grist for an academic mill. In any case, the inefficiencies that Grunwald identified include consultants' estimates that benefit-cost ratios of recent Army Corps' projects are consistently and unequivocally below one, documentation that the Corps has adjusted cost-benefit calculations to justify projects on the Mississippi and Illinois rivers, and well-founded concerns that the Corps' management of an $8 billion effort to resuscitate the Florida everglades—the largest environmental project in world history—will be plagued by substantial cost overruns. Mounting criticism inside and outside of the Bush administration forced the Corps to suspend work on some 150 congressionally approved water projects in 2002 to review the economic analysis the Corps used to justify them. Not only do most waterway projects have questionable social desirability, but barge companies are charged only a small fraction of the costs of operating, maintaining, and renovating the system.[6]

Finally, federal and state governments are responsible for allocating and managing land for grazing, natural conservation, and recreational activities.

5. Michael Grunwald, "Army Corps Delays Study over Flawed Forecasts," *Washington Post*, October 5, 2000, p. A33.

6. Michael Grunwald, "Corps' Taming of Waterways Doesn't Pay Off," *Washington Post*, January 9, 2000, p. A1. Grunwald recently discussed the Corps' failure to protect New Orleans from Hurricane Katrina, despite spending more in Louisiana than in any other state; see "A Flood of Bad Projects," *Washington Post*, May 14, 2006, p. B1.

The U.S. Department of the Interior also sells parcels of public lands to the private sector. It is not known whether the extent of public land holdings reflects an optimal allocation between the public and private sector, but anecdotal evidence periodically appears in the press charging that the government has sold land to private parties at below-market value. For example, a developer acquired land in Nevada that the Interior's Bureau of Land Management valued at $763,000 and sold it the next day for $4.6 million.[7]

Gardner (1997) provided evidence that the rental prices for all users of public lands were below marginal costs. Grazing fees paid by farmers covered only $15 million–$30 million of the roughly $230 million cost of administering the grazing program, and revenues generated from wood and paper manufacturers that use national forests were well below the costs of reforestation and the opportunity cost of land sales. Users of public land for recreational purposes paid a nominal or zero price that does not cover maintenance costs. In fact, a law passed in 2005 increased the share of sites operated by the National Forest Service that are free of charge.

Optimal management of national forests calls for a careful combination of thinning, prescribed burnings, and fire suppression that allows forests to regenerate without producing fires that cause fatalities and damage residential property. Federal spending on the National Forest Service has grown substantially in the past few decades, but the evidence does not indicate that the increased expenditures have led to improved forest regeneration and public safety. The scientific community argues that healthy forest growth could be achieved more efficiently and safely if the service spent less money and let certain types of fires burn and extinguish naturally (O'Toole 2002). Indeed, the longstanding government policy of putting out fires as quickly as possible has led to excessive biomass in the understory that makes fires more deadly and difficult—and thus more costly—to extinguish.

## Services

State and local governments are responsible for managing and providing most of the bus and rail transit in U.S. metropolitan areas. Transit operations

7. Joel Brinkley, "A U.S. Agency Is Accused of Collusion in Land Deals," *New York Times*, October 12, 2002, p. 16.

and investments are funded by farebox revenues and federal, state, and local subsidies. Transit pricing, service, and production sharply deviate from standard economic efficiency guidelines. Transit fares are significantly below the marginal cost of transit service and have failed to keep up with rising operating and capital costs. The operating and capital subsidies that make up this shortfall currently approach $20 billion (Winston 2000). Service frequency is excessive; rail fills only 18 percent of its seats with paying passengers throughout the day, and transit buses fill only 14 percent (loads are somewhat higher during the morning and evening rush hours). Transit costs are inflated by oversized vehicles, excessive labor expenses, and low productivity.[8]

Winston and Shirley (1998) estimated that replacing current transit fares with marginal cost fares and providing service frequency to maximize net benefits would produce annual efficiency gains of $9.2 billion. (Accounting for environmental and safety externalities associated with urban travel had little effect on the findings.) Improvements in production efficiency would significantly increase these gains. Recent work by Winston and Maheshri (2006a) assessed whether urban rail transit was actually socially desirable by comparing recent estimates of its social benefits with its subsidies. The authors found that with the single exception of BART in the San Francisco Bay area, every U.S. transit system actually reduced social welfare. Moreover, they could not identify an efficient pricing policy or physical restructuring of the rail network that would enhance any system's social desirability without effectively eliminating its service. Under public management, rail transit has been unable to attract sufficient patronage to reduce its high average costs—a problem that has been complicated enormously by new patterns of urban development with geographically dispersed residences and jobs.

The growth of automobile and airline travel made intercity rail passenger service highly unprofitable by the 1960s, prompting the formation of the National Railroad Passenger Corporation (popularly known as Am-

8. Despite their low load factor, sixty-seat buses are used in many urban areas on all routes at all times of day. Regarding labor inefficiencies, Section 13(c) of the 1964 Federal Transit Act makes it prohibitively expensive to release a transit employee by obligating federally supported transit agencies to provide any dismissed employee with a monthly compensation package equal to his or her average monthly earnings during the past twelve months. This compensation must be paid for a period equal to the duration of the employee's employment with the transit agency, capped at *six years*.

trak) in 1970 because private railroads no longer wanted to provide this service. Amtrak is a quasi-public enterprise—that is, it is a corporation without private equity holders. The Amtrak board, which includes the secretary of the U.S. Department of Transportation, must approve any notable fare changes, and Amtrak must maintain its service to a city unless it gives the state (and normally Congress) 180 days notice. Amtrak was expected to be self-sufficient within a few years of its inception and to operate without subsidies. However, it has relied on operating and capital subsidies to continue operations. Recently, subsidies have made up 20–30 percent of its revenues.

Morrison (1990) estimated that Amtrak's overall social benefits were roughly equal to its social costs, a finding that justifies federal subsidies. But he also concluded that its social benefits were highly localized—the gains in the well-traveled Northeast corridor offset the losses in the rest of the United States. Because intercity passenger rail service is not socially desirable in many parts of the country, reductions in it would increase economic efficiency.

Finally, the United States Postal Service is the nation's largest public enterprise, with current annual revenues approaching $70 billion. Reorganized in 1970, it is obligated to provide service for different classes of mail to all U.S. residents. The postal service sets prices with regulatory oversight from the Postal Rate Commission and retains a monopoly in letter delivery. Nearly 80 percent of its expenses are labor related, with wages set through collective bargaining with binding arbitration (Geddes 2005). Except for some senior management positions, postal workers' wages have been estimated to be about 30 percent more than those of comparable private sector workers (Hirsch, Wachter, and Gillula 1999).

The postal system was intended to be financially self-sufficient, but its recent annual losses amount to more than $1 billion. Of greater concern is the falling volume of letter mail, in large part because people have substituted Internet-based communications; as a result postal system deficits were expected to grow to several billion dollars by the end of this decade. Prices for first class mail are above marginal costs and are used to partly subsidize prices for second-, third-, and fourth-class mail, which are below marginal costs (Wattles 1973; Adie 1989; Geddes 2003). The postal service also faces strong political pressures to keep open unneeded mail distribution centers

and underutilized post offices and to use outdated, labor-intensive technologies that not only inflate costs but result in slower mail delivery times than optimal. In growing recognition that private sector delivery services could improve its operations, the postal service has recently contracted with Federal Express and United Parcel Service for assistance in sorting and transporting mail. A more comprehensive policy of privatization is discussed later.

# CURRICULUM VITAE

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"The Welfare Effects of ICC Rate Regulation Revisited," *Bell Journal of Economics,* Spring 1981.

*Recent Working Papers:*

"Duopoly Equilibrium Over Time in the Railroad Industry," May 2006, (with S. Dennis and V. Maheshri).

"Competition and Welfare in the U.S. Airline Industry," March 2006 (with S. Morrison and V. Maheshri).

"Persistent Inefficiencies of Public Policy," January 2006 (with V. Maheshri)

**TEACHING**

Institut d'Etudes Politiques de Paris (Sciences Po), Visiting Professor (*professeur invite*):

Lectures on Competition Policy

Massachusetts Institute of Technology:

Applied Microeconomic Theory (undergraduate and graduate)
Transportation Economics (graduate)
Project Evaluation (graduate)
Public Policy Toward Industry (graduate)
Applied Econometrics (graduate)
Advanced Travel Demand Analysis (graduate)

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