

THE BROOKINGS INSTITUTION

REBUILDING THE FOUNDATIONS OF AMERICAN GROWTH

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Introductory Remarks and Moderator:

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P R O C E E D I N G S

MR. WEST: I'm Darrell West, Vice President of Governance Studies at the Brookings Institution, and I'd like to welcome you to this event on Rebuilding the Foundations of American Growth.

The last year and a half have been challenging times for everyone. The United States has suffered through its biggest economic recession since the Great Depression. Although that recession officially is over, we continue to have high unemployment and there remains considerable public anxiety about the future. Along with these issues, the United States faces serious long-term challenges in terms of its overall competitiveness. We have difficulty training and recruiting our next generation of scientists and engineers, we need to maintain our excellence in innovation that has propelled our nation's past economic growth and we need public policies that enhance our long-term competitiveness.

To help us develop a better understanding of these important issues, we are pleased to welcome Mr. Paul Otellini, the President and CEO of the Intel Corporation. Intel is a company that of course needs no introduction, but that doesn't mean I'm not going to provide one. It has the ninth most valuable brand in the world. It makes microchips that power more than 80 percent of the world's personal computers as well as thousands of other electronic devices. During its 40-year history the company has been guided by America's leading business minds including the company's co-founder Robert Noyce and Andy Grove.

Today's speaker is the latest long line of outstanding leaders. Paul grew up in San Francisco and received his undergraduate degree at the University of San Francisco and his MBA from the University of California at Berkeley. He joined Intel in 1974 as an analyst in the company's Finance Department. He rose rapidly through the

ranks to become head of the Personal Computer Division and then the Global Sales and Marketing Organization. In 2005 he became the company's fifth CEO and since that time Paul has provided strong and dynamic leadership. He has refused the company's efforts to innovate and grow beyond the personal computer. He has led the company in becoming cost competitive in new markets, in developing products for mobile devices and for adding new customers who are driving Intel's current growth.

In his remarks today Paul will share his thoughts on the need to create a culture of investment in the United States. He is very interested in education, innovation and the creation of new businesses and new industries. He'll be discussing what we need to do to help our nation maintain a globally competitive economy. Please join me in welcoming Mr. Paul Otellini to the Brookings Institution.

MR. OTELLINI: Thank you and good morning. Darrell, with an introduction like that, you could go on for as long as you'd like.

I wanted to begin by thanking Darrell West and the Brookings Institution for hosting us here today. It was a year ago this week that I came to Washington and announced that my company, Intel, would make a \$7 billion investment in our U.S.-based manufacturing plants specifically targeted to produce silicon wafers with 32 nanometer technology, the most sophisticated technology we have ever invented.

You'll recall of course that when I made that announcement the U.S. economy was facing one of the greatest crises in our history. I called it the worst economy I'd seen in my 35 years at Intel. Yet I believe that our investment was good for both our company and our country. It was a way to increase our commitment to innovation and future competitiveness. As it turned out, America and the world avoided the worst-case economic scenarios, but we're not out of the woods, and I'm concerned

that we're not taking all of the right steps as a nation to ensure that our economy is on a long-term trajectory of growth and leadership.

The United States now faces a world with much tougher competitors. Many of them are accelerating their investment in the future faster than we are. The implications of this new era of competitiveness is my topic today. So this morning I'd like to provide an update on the investment that I announced last year and then share some thoughts on what else both business and government should be doing, in fact, must be doing to create a globally competitive economy.

Let me start with the investment that we made in our FABs, the state-of-the-art manufacturing facilities where we produce the world's leading microprocessors. We now have two factories in Oregon producing 32 nanometer chips, and our factories in Arizona and New Mexico will be in production later this year. These factories are making tiny electronic systems embedded on a silicon chip roughly the size of your fingernail. To give you a sense of how far this technology has progressed, I think it's worth comparing these microprocessors to the very first ones we produced in 1971. The earliest ones contained about 2,300 transistors. The ones we're producing today routinely include more than a billion transistors. As a result they're far more capable, they enable faster computers, the most advanced consumer electronics devices, sophisticated imaging for medical care, the brains inside the next generation of robotics and thousands and thousands of other applications. And they do all of this while consuming far less energy than their predecessors. We believe these chips are the most dynamic platform for innovation that our company has ever produced. Our investment in the U.S. factories that are producing these chips was not a one-time gesture. Intel invests money all over the world. Seventy-five percent of our sales after all come from outside of the U.S. But 75 percent of our manufacturing and R&D spending continues to be concentrated inside

the United States where we attract some of the most talented scientists and engineers from around the world.

Just last year we invested more than \$5 billion on research and development in areas that span from the exploration of new materials to create even smaller transistors to products that we believe will transform the way that health care is delivered, to future technologies that involve augmented reality and computing the response to human gestures. These are long-term investments for us. Much of what we work on today will not drive meaningful business results for 5 or 10 years. But in a competitive, innovative industry, this is what you must do.

There is no guarantee that the U.S. receive all of this investment in the future. We need to address the fact that government policies can create disincentives to investing in America, and the trends here are worrisome. What is true for companies is also true for countries. Global competitiveness requires continually making investments for the future, investments in things that make innovation possible even if they don't yield results immediately. Unfortunately, long-term investments in education, research, digital technology and human capital have been steadily declining in the United States. So too has the commitment to policies that made us such an entrepreneurial powerhouse for more than a century. This is the bitter truth, but we don't hear enough about it.

At one time the United States could boast about the best students in math, science and engineering. Our research centers were without peer. No country was more attractive for startup capital or global investors. We seemed a generation ahead of the rest of the world in information technology. That simply is no longer the case. Over the past decade our competitors have focused on the very things that made America's innovative economy the strongest in the world. As I travel around the world, what I see from business and government leaders, students and employees, is very

instructive. Other countries have focused on investing in innovation, creating national policies to build digital infrastructure and have moved quickly to embrace sustainable energy. We're seeing this not just in India and China, but in Finland, Korea, Japan, the Netherlands and many other places. All of this activity on their part is making them far more potent competitors in the next phase of the global economy.

Last fall in a very insightful article about American innovation, Steven Izel pointed out that a recent study ranked the U.S. sixth among the top 40 industrialized nations in innovative competitiveness, not great, but not bad. Yet that same study also measured what they call the rate of change in innovation capacity over the last decade, in effect how much countries were doing to make themselves more innovative for the future. The study relied on 16 different metrics in human capital, IT infrastructure, economic performance and so on. On this scale the U.S. was ranked dead last out of the same 40 nations. The news may sound shocking but it shouldn't be. When you take a hard look at the things that make any country competitive it becomes clear that we are slipping.

Consider the credits that we give to businesses that invest in R&D. They were once the most generous in the world. Today companies find their R&D investments more valued and more rewarded by many other countries. Or think about our ability to win the global war for talent. Our immigration policies seem deliberately designed to prevent us from attracting the best minds in the world. American companies are given a tiny allotment of visas for foreign-born engineers and scientists. Last year the quota of visas for those with advanced degrees was completely filled by April. With such policies are we surprised that more and more top-performing students return to their home companies after studying in our graduate schools?

Then there are taxes. At a time when countries in Europe and Asia are clamoring to offer companies like Intel significant tax benefits to build factories, the

national tax incentives for companies to invest here in the U.S. are few. Our combined state and federal corporate tax is the second highest in the world. Economists at the OECD tell us it is precisely these high statutory corporate rates that punish the most dynamic and innovative firms. Lastly, we have significant uncertainty relative to the future costs that businesses may incur in the areas of health care and energy costs. On all of these issues there may be legitimate policy differences, but as a nation we must have a clear and enduring strategy to promote innovation, investment and startup companies, a set of policies that let American businesses confidently invest in the future, raise capital, take risks and feel assured that we are training the talent to lead to the next generation of industries. That after all is what the rest of the world is doing.

Over the next 3 years for example China, India and South Korea will invest three times the amount that we do in clean energy technologies. Taiwan has made itself into an IT giant because of sound long-term planning. After the Asian Financial Crisis of the 1990s, Taiwan used the opportunity to invest in IT just as Korea and Japan were cutting back their spending. Today the country is the undisputed center for PC design and innovation, exporting the computers it builds to the rest of the world. Then there's India. This country has put in place an aggressive program working with several companies including Intel to enable half a billion internet users and 100 million broadband connections by 2012, 2 years from now. Meanwhile, the country that invented the internet, that's use, has been slow to develop our own national broadband strategy.

The countries of Europe, Asia, Latin America, and before long the Middle East, are going to be competing with us in every sphere of the economy in the years ahead. If we want to stay with them and remain a vibrant growth economy, we have to recommit to a strategy that drives the economic growth of the future. Let me be clear. After the financial crisis, short-term measures were a necessary part of economic policy.

The stimulus package passed by Congress last year for example undoubtedly steered the economy away from much more serious problems. My biggest concern though is that so much of the spending is targeted to occur in 2011 and 2012, well after most people believe that the crisis will have passed. Other countries, most notably China, managed to put stimulus funds to work much faster and are benefiting from that today.

But stimulus spending is not a substitute for forward-looking investments that help create the underpinnings of economic growth. And perhaps the most important of those is education, an area in which international test scores continually tell us we are failing to be competitive. But it doesn't have to remain like that. This is an area of particular interest to me. Our business after all depends on a pipeline of highly skilled people to help us discover subsequent generations of innovation. I'm very proud to tell you that over the last decade Intel has invested nearly one billion dollars in education around the world especially in the areas of math and science education. Our goal has been to create the innovation capacity for the future by preparing teachers to integrate technology into the classrooms and the learning processes. Our Intel Teach Program has already trained more than 7 million teachers worldwide and more than 350,000 in the United States. The result is improved critical thinking, research and problem-solving skills that students need to succeed in the jobs of the future. We see this as a vital investment in the next innovators, thinkers, scientists, builders and entrepreneurs. This is an area where the U.S. must succeed. Growth in math-intensive science and engineering jobs outpace overall job growth by 3 to 1. Think about this. According to one source, America's GDP would grow by more than a third if U.S. students became globally competitive in math and science. Any real strategy for future competitiveness has to address this issue. President Obama has made this issue a top focus for his administration. We see it as the responsibility of not just government, but of every

business that depends on highly skilled employees. By the way, if you want to be inspired by what America's young people have to offer, please join us here in D.C. on March 16 to celebrate the best and brightest as 40 of America's top young scientists display their projects and vie for more than one million dollars in scholarships at the Intel Science Talent Search. This is one way that we shine a light on what's possible to inspire others to achieve.

I've talked a lot about how government can partner with business and how it can establish the strongest incentives for investment. Let me also make clear that there are things that businesses must do, in fact ought to do, regardless of what government achieves. Today, I want to talk about two specific initiatives that I hope will raise the bar for all companies that want to make a difference and invest in the future.

The first is to create jobs immediately for college students, especially majors in engineering and computer science. This is an indispensable resource for the United States, and in the current climate there hasn't been enough hiring momentum for these people.

Over the last several weeks, I've spoken with the CEOs of several leading companies about making sure that we put this resource to work, and today I'm pleased to announce that Accenture, Adobe Systems, Autodesk, Broadcom, CDW, Cisco, Dell, eBay, EMC, GE, Google, HP, Liberty Mutual, Marvell, Microsoft and Yahoo have all committed to join Intel in increasing their college graduate hiring in the United States this year. Most of them will join us in at least doubling our college graduate hiring, leading to a total of over 10,500 new jobs from just these few, these 17 companies that I mentioned, and these jobs will represent an annual payroll, including benefits, of over a billion dollars a year. Collectively, this is a bet on America's next generation of innovators. We cannot afford to let our future scientists and engineers sit idle after graduation.

The second announcement I'd like to make looks even further into the future. I'm pleased to announce the inception of the Invest in America Alliance, a group of leading VC companies committing to steer investments into technologies that will drive economic growth and job creation in the United States. The members of this alliance have committed to invest \$3.5 billion in promising clean technology, information technology and biotechnology companies over approximately the next 2 years. As part of the alliance, Intel Capital will participate with its own \$200 million commitment.

Intel has worked with 24 leading venture capital firms to join us with their own commitments in support of this alliance, including Advanced Technology Ventures, Braemar Energy Ventures, Bridgescale Partners, Canaan Partners, DCM, Draper Fisher Jurvetson, Flywheel Ventures, Good Energies, Institutional Venture Partners, Investcorp Technology Partners, Khosla Ventures, Kleiner Perkins Caufield and Byers, Menlo Ventures, Mohr Davidow Ventures, New Enterprise Associates, North Bridge Venture Partners, QuestMark Partners, Sevin Rosen Funds, Storm Ventures, Telesoft Partners, Udata Partners, U.S. Venture Partners, Venrock and Walden International. Those are the leading venture capital firms in the world, coming together, committing \$3.5 billion to U.S. investments.

I believe that together our investments to seeding the ground with startup capital will prove to be a very rewarding investment for both the companies that contribute and for the competitiveness of the United States. Since venture-backed companies in the U.S. accounted for more than \$12 million jobs, or 11 percent of the total private sector employment, in 2008, these investments will also help drive job growth in the U.S. now and in the future.

I'd like to conclude on an optimistic note. A year ago, we were focused on avoiding economic calamity. Today, we need to start focusing on the future. That future is going

to be more demanding, more competitive and, frankly, more disruptive to American business. But those conditions, as anyone who has ever worked in Silicon Valley knows, can be exactly the right environment for new thinking and breakthrough innovations. That is why fostering such an environment ought to be the essential characteristic of our economic policy and the plans of every competitive business.

I hope that my thoughts today can help create a common ground between business and government, a shared vision that allows us to start focusing on the future, not just the crisis of the day.

All of my life I have believed that America's best years are still ahead of it. If we focus, invest and work hard, that belief will hold true.

Thank you.

(Applause)

MR. WEST: First of all, thank you very much for those comments and that leadership, especially the two new initiatives that were announced today. Creating 10,500 jobs is terrific, given the state of our country's high unemployment. And then also Invest in America, the alliance that you're creating, certain is a bold new venture.

At the very end of your talk, you mentioned the importance of focusing on the future and that we need to create an environment for new thinking. I was reminded that last February you gave a speech at the Washington, D.C. Economics Club, and you said that you thought the economic crisis represented an opportunity for institutions to look at themselves, and to think about how to reshape things and how to behave in a different way.

Okay, now it's a year later. How would you assess the job that our institutions are doing, both in terms of business institutions as well as political ones? Have they risen to

the challenge? Are they making the types of changes that you thought were necessary a year ago?

MR. OTELLINI: With a few exceptions, no. I think you've seen some companies make some big bets on the future, and try and change directions. I'll point out, shout out GE as I think a notable example of a gigantic company, an old company, a 100-year-old company that's trying to change itself and is retooling itself while it can. Most companies, most people don't change until they have to.

Intel had the ability to change in 2006, 2007, 2008 before the recession hit because we thought that the business of the future would be different than the business of the past. So, going into the recession, we were already restructured. We had the luxury then of going through the recession mostly intact.

I think other companies had to make pretty drastic changes, cutbacks and so forth, and I don't think they've come out of it yet, rethinking where they want to be or where their businesses will be, with a few exceptions like GE.

I could extend that to the banks. I mean that is an example. It's not clear that there's anything different today than there was five years ago, and yet these institutions are more necessary today to our society and our economy than they've ever been.

MR. WEST: In terms of our political institutions, I mean you had several pointed comments comparing the United States to other countries and other countries kind of stepping up, China doing their stimulus package, kind of investing the funds more rapidly. How would rate the job Congress and the President have done?

MR. OTELLINI: Oh, boy.

MR. WEST: Now is when you get in trouble.

MR. OTELLINI: Yes, it is. It's pretty poor. I think it's been a series of endless compromises and debates at a time when action is needed.

I was in Europe last week, and I met with the Finance Minister of France, Christine Lagarde. For many, many years, France was a place that you didn't think about as a place you would do investments -- the 35-hour week and the social welfare state and those kinds of things. They've changed, and they've changed in the last few years, principally under Sarkozy.

But Christine told me that France now offers a 50 percent on R&D against maybe a 20 percent credit in the United States that sometimes may go away. So you're thinking about hiring an engineer. Where would you hire that engineer? In California or in Toulouse? It's half, well, almost half the price.

So I think you have to think about these things. While other countries are making hard decisions on attracting investments, we're debating earmarks.

MR. WEST: But yet, you seem very optimistic about the long-term future of the United States. You're creating jobs. You're forming this fund to invest in America. What's the basis of your optimism there?

MR. OTELLINI: Our entrepreneurial zeal is second to none. Our education at the graduate school levels, particularly in math and science and engineering, is second to none. I don't see that changing for a long time. That's why the best and the brightest in the world go to our schools. So, if we could figure out how to capture that and channel it into our companies, our startups and those kinds of things, I'm convinced that cycle will repeat itself, independent of short-term perturbations.

MR. WEST: Okay. Why don't we open the floor to questions from our audience? We have someone with a microphone right there on the aisle, and we'll start here, if you give your name and your organization, and if you could keep your questions brief just so we can get to as many people as possible.

Yes, sir.

MR. ALTMAN: Hi. I'm Fred Altman. I'm retired from NIMH.

And my question is seeing that you're competing in the United States against countries that provide health care and the companies don't have to do it, how important is passing health care to making rapid progress?

MR. OTELLINI: Well, all of Intel's employees get health care, and it's all paid for eventually by the employers. I mean even in countries where they provide it, you pay a salary; it goes into the tax system and gets paid. So, from that perspective at the employee level, I don't see a difference, and our employees will remain covered whether they're here or somewhere else.

The health care question that's in debate, I think right now is not one that -- my only concern as a businessman is are we doing something which will significantly increase the costs or decrease the benefits to my employees? Some of the proposals, at least one of the proposals that's going through, the ostriser now, would tax some of the plans that we offer our employees at a pretty hefty rate. That would mean they would have less. They would end up paying more money, or less benefits. That's not good.

MR. WEST: Okay, right behind that gentleman is another question.

MR. MANHEIM: Frank Manheim, George Mason University.

I recently compared a study of U.S. and Europe, and here I find the watch word is innovation, but there seems to also be a stigma. When I was a grad student in the sciences, most of the grads automatically went to industry. Now the greatest outlet for science seems to be university, writing peer review papers, and part of that seems to be because of the theme that industry or manufacturing is a thing of the past in the United States. Could you comment on whether the climate in many respects in the U.S. is hostile to manufacturing and industry?

MR. OTELLINI: Well, I think those are two different questions. Let me deal with the graduate student first and then talk about the climate.

I haven't seen your observation in practice. Intel has 4,000 Ph.D.s on the payroll, principally in the United States. I'm on the board at Google. I watch who they hire each year. I have friends at Microsoft and other high-tech companies. We are still incredibly large employers of exactly the people that you say are competing to write peer reviews.

If you want to go into academia, that's a choice. But if these students want real jobs doing research or development, in real companies and technology and engineering, there are plenty available, and there's just 10,000 more as of today.

MR. MANHEIM: You're the top. What about the rest of the country?

MR. OTELLINI: Well, that's different. That's a third question. Maybe we'll defer that one.

On the climate for manufacturing, it is tough, and that was some of my comments today. When I look at building a new factory, a new semiconductor factory which costs about \$4.5 billion, the cost of putting that factory in the United States versus not is an extra billion dollars for me. And it's not low cost labor. It is the difference in R&D credits, capital equipment credits, tax credits and those kinds of things, and you get access to local markets. So we're continuing to invest in the United States, but the cost, the opportunity cost of these decisions is getting larger and larger as we do nothing.

MR. WEST: Right here.

MR. NEALE: Michael Neale at the Joint Economic Committee.

One of the things that we're seeing in the employment data is that there's a concern about the long-term unemployed, those that have been unemployed for six months or more. I think that's more than 40 percent of the total unemployed. Then when you get to like a year longer, that's like half of the 40 percent, so about 20 percent or so.

I guess two questions. Number one, what exactly is the source of this concern? Yes, what exactly is the source of this concern? Is it stigma or what is that issue?

Then number two, as a tech company, what then are some of the things, what are some of the policy actions that we ought to be thinking about in order to actually kind of break the back of this?

MR. OTELLINI: I have no idea what the source is. I mean not knowing the study and not being one of those people. So I can't opine on it.

MR. NEALE: It's not a study, just data.

MR. OTELLINI: I still can't. I mean I don't know why they are chronically unemployed. I don't see a stigma. If someone is qualified for a job that's applying at Intel, we'll hire them.

I'm sorry; I lost the second part of the question.

MR. NEALE: How do we kind of break the back of it?

MR. OTELLINI: Well, we looked. When I was putting my thoughts together for this speech, we looked at a third initiative which was what if we got the tech industry to get together on retraining and maybe grab some of these people that are chronically unemployed and put them through retraining processes that would make them qualified to work in high tech today. And as I looked at that, I found out there were just so many pre-existing programs in that area, both public and private, that we, frankly, couldn't add anything new to that stew. It seems to be already being addressed by a variety of bodies. And so our thinking was to do something new and innovative that wasn't being addressed at this point in time.

MR. WEST: Okay. There's a question right there.

SPEAKER: Michael – Consortium for Science, Policy and Outcomes. Innovation ultimately comes down to one person having an idea. What makes these people different from the rest of us, and how can our educational infrastructure in business climate support these people?

MR. OTELLINI: I think that's too narrow a definition of innovation. I think there's often, you know, there is that light bulb idea that one person has which is the thing you described. And I do think the United States is particularly good at that, and the track record of the United States says that we have the majority of those light popping ideas for the last 100 years.

In a company like Intel, though, innovation is not a one person deal, because the products we make are so complex, you know. Our new generation of silicon technology takes us four years to develop, there's probably 2,000 engineers working on it, a billion dollars of R&D goes into it, you're inventing new materials to be used, new structures, new equipment, it's a process of collaborative innovation that, to me, has the sustainable breakthroughs that have really been able to advance science.

And that used to be done in the Bell labs of the world, now it's done in the Intel labs of the world, or the Microsoft labs of the world. And that is not as often one person, as legend would have it.

MR. WEST: Okay. In the back, there was a question? Yeah, right there.

MR. O'CONNOR: Dan O'Connor, CCIA; I was wondering if I can get Mr. Otellini's thoughts on the current patent system in the United States and –

MR. OTELLINI: On what system?

MR. O'CONNOR: The patent system.

MR. OTELLINI: Yeah.

MR. O'CONNOR: And how – I mean with patent reform going through Congress and patent playing such a critical role in the IT industry, there's a lot of talk about how it's hurting or harming, depending which side you're on, high tech innovation, and I wonder if you're in the field and get your thoughts on how that's effecting your company.

MR. OTELLINI: I agree: if it isn't broken, it's pretty darn close to broken. And there's at least two layers of things that I think need to be addressed; one is the process itself, you know. The technology has gotten so – in terms of what is being patented in our industry or in biotech and so forth that getting qualified examiners able to look at prior art and understand the invention and the narrowness of the – or the breadth of it in a timely fashion is something which is simply problematic and under funded.

And, to me, the Patent Office needs a substantial change in its funding mechanisms to be able to get proper review in a timely fashion, so that's one end of the spectrum.

The other end of the spectrum is, once something gets through that process and becomes a patent, it is – increasingly, the use of patents isn't to protect the inventor, but it's to attack somebody else, because of the process of creating these patents. And so patent reform, you know, in terms of litigation areas is really what our prime interest is here. And you've got four constituencies that don't always have the same agenda. You've got tech, you've got farmer, you have small investors, and you have universities.

And weaving across all of those is this whole notion of patent trolls who buy a patent and then go sue a rich company, usually in the Eastern District of Texas, and that has gotten totally out of hand.

I think we had good progress on getting a consensus bill agreed last year, the Hatch bill, and it seems to have gone into suspended animation right now. We're hoping that it gets revitalized this year. There's a good chance to get this done, good time to get it done and stop some of the nonsense here. Meanwhile, I think the administration's funding – part of the problem more aggressively.

MR. WEST: Here in the front row with a question.

MR. PAREKH: Hi, Sudit Parekh with the Battelle Memorial Institute, to talk about the stem education, math and science education that you discussing. What do you think is needed, is it more money, is it a reform of the system? How can business change the success that we get out of the dollars that we spend?

MR. OTELLINI: Well, I think it's accountability, it's involvement, it's reward systems, it's incentives, it is better teachers. I forget the exact statistic, but the number of math teachers in this country that were trained to teach math is well under 50 percent, it may be 30 percent or something like that, but it's a very low number.

To me, the only way you can stimulate kids, particularly girls, in math and science is to have a math teacher that inspires them. And, you know, we lose girls at an alarming rate out of math and science in the fourth grade, and we lose boys in high school. So we need to figure out a way to get better teachers in there first, and incentives.

One thing that China does, I don't want to use them as the paragon here, but my understanding was, when they run the nation-wide science talent contest that they have, you know, the science fairs, the top ten percent get instant admission to any college they want. Now, you know, I don't know what the right model is, but something like that that says if you're in the top one percent of science fair participants in the United States, you can get into any college you want. Forget this admissions process. Wouldn't

that be a nice incentive, to put people into the mode of investing in math and science? So I think there's a lot of little things, and there has to be pull on the other side. We have to make sure that there's jobs, well paid jobs, that when these kids get out of college, they can find a home.

MS. SWICK: Hi, I'm Julie Swick, I'm also with Battelle. I just want to piggyback on that question. When you talked about the teachers that you're training to go out and teach stem, are they – what level are they, high school, middle school?

MR. OTELLINI: K through 12.

MS. SWICK: K through 12; so what I'm finding is most of the programs are focused on high school. The Gates Foundation is primarily high school, and it's a little too late by then.

MR. OTELLINI: Yeah, I agree, and that's why we do – a lot of our stuff is in the elementary school. But, you know, there was a disparity between those numbers. I guess I said seven million world-wide, 350,000 in the United States when we started here, so I think that disparity itself is alarming. It's not like we're deliberately training overseas. There are significant impediments here that are imposed by the school districts, the teachers unions and those kinds of things that are different than you see in other countries, where China says we want all of our teachers trained, six million teachers, go get them trained, and we've got north of two million trained already, they just make it an imperative.

MR. WEST: Okay. Right over here is a question.

MS. LAVINSKY: Hi, my name is Stephanie Sheridan-Lavinsky, I'm a graduate student at Johns Hopkins.

MR. WEST: A little closer to the mic.

MS. LAVINSKY: I'm a graduate student at Johns Hopkins, and I had a question about the risk climate I guess within R&D now and how you would say that the last couple of years, given the financial crisis, has impacted the risk climate within R&D and how that might effect future progress.

MR. OTELLINI: Well, very few tech companies, I'm trying to think of any, cut their R&D that I can recall, of any measurable number. So, you know, if you consider that it's the economic crisis that cuts the money which cuts your seed corn, I really haven't seen that in our industry. I've read about it in some of the biotech, but that's mostly a function of the – consolidation of that industry, so they're eliminating redundancies and inefficiencies.

Now, I do think that prior to this year's budget, there was an issue relative to the funding of the big national research organizations, and I think they've doubled it in this years' budget again, so that's a good start, I think we're up to two percent.

MR. WEST: Right there.

SPEAKER: -- Kahn with Orcal. You made a comment about some of these other countries. What I've noticed that culturally, the parents encourage their children much earlier in their lives, so the government and the education are enablers, but there's, obviously, a lot of encouragement, and what do you think the parents' role should be here in terms of providing that encouragement for getting students to go into those fields and, you know, "make those fields cool to go to" for kids that might be in eighth or ninth grade? Thank you.

MR. OTELLINI: The role ought to be exactly the same. The problem is, the role models are less. And, you know, it's easy, I think even wind the clock back to the '50's and '60's here, particularly with some of the big programs like, you know, put a man

on the moon. Science was cool, technology was cool, math was cool, and you know, pre-geek then was cool, and I think that really generated much of our modern wealth today as a country.

And that model was not unknown by – or unwatched by the rest of the world. And so you see China, India, Brazil, to a lesser extent, Russia, trying to emulate that now. By the way, all we did was emulate what the British did before 1900, they just did it in a different industry, and we did it with our industries.

So I think part of it is, there has to be some degree of pull where the good jobs are going to be. It's with a bit of irony that I watch the Quats, you know, the great math guys coming out of the schools who all go into Wall Street, coming back looking for jobs at companies like yours and mine, and I think that's great.

You know, the fact that you can now recruit some of the best and the brightest, and they aren't going to go out and create derivatives, but maybe they'll create some real value, is a good thing for the world.

MR. WEST: Now you're making news. Okay. We have time just for a couple more questions. In the back on the aisle.

SPEAKER: Okay. My name is – from the --

MR. OTELLINI: Where are you? Oh, there you are.

SPEAKER: Okay. My question, I think there's only so much that big companies can do, like Oracal, Microsoft, Intel, so because of the credit crunch, I was thinking, is there a way that it could be a public/private partnership, where the government can simulate entrepreneurs by maybe creating a – from like the – do?

MR. OTELLINI: Well, you know, I don't see that particular problem, and here's \$3 and a half billion. You know, if you've got a great idea, there's people in this audience that are happy to write you a check. So I don't think it's a credit crunch on the

VC side. In fact, there's a lot more VC money waiting to be invested today on the sidelines than we've had in a decade probably.

And the idea that the government would get in the middle of our decisions on which companies to fund, to me, is probably not the best use of government. You know, I don't think that – that would not be something I would support right now.

MR. WEST: Actually, there's one more question right in front of you, I just want to get to one more person.

MR. RADIA: Ryan Radia with the Competitive Enterprise Institute. Many of America's most innovative high tech firms, including Intel, have recently been the target of anti-trust challenges on both sides of the Atlantic. How does competition policy effect investment and innovation, and is it in need of reform?

MR. OTELLINI: I think it is in need of reform in the sense that there are reformers in Europe and perhaps in some of the agencies here in Washington that are behind the curve on what makes technology tick. I mean the heart of technology for 50 years has been around the law of increasing returns around standards.

And when a company has an invention around a standard, they ought to be able to reap the rewards of that, assuming they compete fairly. And I think that there is a growing sentiment, certainly in Europe, where that is just unfair and wrong, and you need to protect competitors as opposed to protecting consumers. In my view, you know, the old U.S. view, which is DRJ view, protecting consumers ought to be the ultimate test. If the consumer is getting better product at lower prices year after year, the system works, and if he's not, then something ought to be done differently. And I think that the old laws are not yet caught up to where technology is and where it's going.

MR. WEST: Okay. I guess we have time just for one more question, right here. Right there, the gentleman with his hand up right there.

MR. WALKER: I'm Jim Walker; I'm retired right now, but when I was in senior management, I used things like preparing presentations and doing research projects, and things that I read are now being sent to India and researched in China and Taiwan; how does that effect our short and long term development of junior management into senior management?

MR. OTELLINI: Gosh, I don't know, I haven't seen that trend. I mean we use, around the world, mostly U.S. based training. A lot of it – most of it is developed ourselves. Our latest training is actually out of Darton, University of Virginia that we're putting the top 1,000 people through. So I haven't seen the outsourcing of thought around management leadership and management training.

SPEAKER: (off mic)

MR. OTELLINI: I'll see Tom at lunch, I'll ask him, I haven't seen this.

MR. WEST: Okay. We are out of time. I know we have a number of journalists here, and if you have additional questions for Mr. Otellini, we've set up space it the -- Room, which is the next auditorium over in this direction, so Paul will join you over there in a few minutes, and will be happy to answer additional questions that you may have.

But I want to thank Paul for sharing his thoughts, for the leadership that you're developing in terms of job creation and investing in America. We really appreciate your coming to Brookings to join us. Thank you.

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