

Intel CEO Paul Otellini Takes a Long Look Ahead: The Economic Crisis and the Importance of Investing

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SOUND BITES FROM PAUL OTELLINI'S SPEECH

Key to success: For any nation in the 21st century, but particularly for the United States, supporting a true culture of investment is the key to long-term success. **Invest to improve:** If we are committed to investing in ideas to *improve*—not just *maintain*—what we have and what we know, the United States will do more than just recover from this recession. We will emerge, once again, as a competitive, global powerhouse. This is the essential stimulus plan we need—not one that attempts to shore up the status quo or delay the inevitable changes needed. **U.S.-based:** Intel is a global company today, and proudly so. Yet, we still think of ourselves as a prime example of American enterprise in the 21st century. Seventy-five percent of Intel products today are sold outside the United States. Yet, we still build 75% of our products in U.S. factories, and more than half our employees work here. And 70% of the dollars we devote to research and development and capital investment are spent here in America. **Domestic production:** Today, I am pleased to announce our intention to stamp the words, “Made in America” on even more Intel products in the months and years to come. Today, we are announcing that Intel will add to its already large factory network with our largest-ever investment in a single-process technology...and it's in the U.S. We will invest \$7 billion into factories in New Mexico, Arizona, and Oregon to manufacture silicon wafers with the world's most advanced 32 nanometer process technology. [President Obama] called me last night at the Hay-Adams after he got back from Indiana and wanted to congratulate us on this announcement. **Stimulus plan:** The government's stimulus plan, which includes large amounts of things that I consider investment-grade spending, is very good and will open up the spigots....At the end of the day, this is all about confidence.

DAVID RUBENSTEIN: Welcome, I am David Rubenstein, President of The Economic Club of Washington. Over many years, American companies have become leaders around the world in their technological prowess. During the late part of the past century, America became dominant in the computer and technology area. Companies that became iconic brand names around the world for their economical strength and technological prowess and global leadership were companies such as IBM or Hewlett Packard.

Then, when the era of the personal computer came about, it was, of course, Apple and Microsoft and Dell, among others. But in the personal computer era, what really made those personal computers so dominant were the brains inside them. The brains inside those personal computers were the microprocessors that were built and invented by Intel. Intel became a dominant iconic company for American manufacturing and American semiconductors, and in fact for the past 17 years has been the dominant global semiconductor manufacturer.

Intel was started by a number of engineers in the late 1960s, principally Robert Noyce and Gordon Moore. They led the company in the early years, and then followed Andy Grove and Craig Barrett. So the company has had extraordinary leaders over the years, and that's one reason why it has been so successful. Paul Otellini is also one of these great leaders that Intel has generated. He grew up in the Intel ranks. He grew up in San Francisco, received his undergraduate degree at the University of San Francisco, his M.B.A. from the University of California at Berkeley, and then joined Intel in the mid 1970s and rose up to be the head of the Personal Computer Division, among other things, and has really provided the same kind of strong, dynamic leadership that his predecessors provided. Now, clearly, today is a more difficult situation that Paul inherited.

Under his leadership, Intel had the highest revenues it's ever had and the highest earnings it's ever had. But the semiconductor industry is subject to down cycles, and like many other parts of the U.S. economy, the semiconductor industry is in one of its down cycles. But Paul has some announcements to make today about what Intel is doing to deal with this issue, and also to tell you some of his thoughts on how Intel can be a leader in helping the United States regenerate its economic strength. Ladies and gentlemen, Mr. Paul Otellini.

PAUL OTELLINI: Thank you, David. In recent weeks, this city has been the center of an urgent national debate over the best way to bring our economy back to health. I thought I'd give you a bit of perspective from the world of technology and manufacturing—the world I know best. I think the debate in Washington has been a very healthy one. But at the same time, I worry that we might see what some call an unintended consequence. When we face a crisis—let's be honest—our habit is to hunker down and hold fast to what we have and what we know: the jobs, the businesses, the institutions, and the ways of life we are familiar with and don't want to lose. It is a perfectly understandable reaction when uncertainty becomes a part of our lives. But I see this economic crisis differently. Our institutions and paradigms have become unfrozen by this economic crisis. We have a once-in-a-lifetime opportunity to reshape how things will look and behave as growth resumes.

This is riskier. There is more uncertainty. It is less comforting. Taking that leap can be downright scary. But it is the only proven path to pull out of bad times. If we want to see a return of American prosperity, we have no other choice than to invest in creating the future, not merely preserving the past. How we reach for that future—and why it is so important—is why I'm here today. I don't want to sound cavalier. I know, first hand, that we are experiencing the worst economic conditions that we have seen since I began at Intel almost 35 years ago.

Due to the dramatic contraction in global demand for computers, our revenues dropped 23% in the fourth quarter. Like every company, Intel is taking steps to manage our way through the near-term reality. It is tough on our employees and our business partners. Every business in Silicon Valley is suffering similar results. Indeed, this recession is sparing no part of the global economy. No one is confident predicting what the next quarter is like, yet alone the next year. Our entire country is experiencing anxiety about the future. Today, when I look out at the American economic landscape, I'm aware of a cruel, but ironic, fact: I have spent my life at a company that has been devoted to a theory—Moore's Law—about the predictability of

technology and product development.

Yet I find myself acknowledging that there is nothing predictable about our future economic well being. On this issue, we need a lot more candor: For nations like the United States, absolutely nothing about the future is inevitable or guaranteed—not jobs, not leadership, not our standard of living. We are at an inflection point. The fundamentals to which we have become accustomed have changed. How we deal with these changes can lead us to new heights—or they will define the beginning of a downward spiral. As we contemplate our future, we must accept the fact that many of the assumptions under which business operated for the past 50 years no longer hold true.

The forces of globalization that were reshaping the world before the economy went into a severe downturn are still hard at work today, despite the desire of many to attempt to turn back the clock. With the emergence of new economic powers like China and India, America no longer dominates the global economic stage. Innovation no longer belongs to a single country or region. It is more evenly distributed and, in fact, accrues to countries in proportion to the quality and rigor of their educational systems. The future for every nation will be shaped by new ideas and creativity. These are the engines of future prosperity. I think it's fair to say that today America lacks the confidence that we have the right strategy to maintain unquestioned leadership in this new environment. This leads us to uncertainty about our future.

But if you've come today for a depressing message, you've come to the wrong place. At Intel, it is deeply embedded in our culture that times of crisis are opportunities, not only to build *back*, but also to build *better*. Our former CEO, Andy Grove, once said, "Bad companies are destroyed by crisis. Good companies survive them. Great companies are improved by them." I think that the same holds true for industries and even for countries. In the current crisis, I believe that America's goal should not be just to survive, but rather to become better than ever. How do we do it? Almost exactly 100 years ago, President Theodore Roosevelt said, "The one characteristic more essential than any other is foresight. It should be the growing nation with a future that takes the long look ahead." Looking ahead, it's clear that we are living in one of the most remarkable periods of creativity and possibility.

From biomedicine to nanotechnology, the world of life science is destined to change the way we live within our lifetimes. From wind turbines to solar panels, we are at the very beginning of transforming how we generate and consume energy. From broadband to microprocessors, we are connecting the world in ways that were unimaginable just a few years ago. Our challenge is not to just enjoy the benefits of the discoveries so far. Our *obligation* is to invest to take them further. Taking the "long look ahead" requires a conscious decision to continue as the global leader—especially while there is a lot more competition for that title. I say "conscious decision" because remaining the global leader won't just happen on its own.

Let me warn you, while it is easy to talk about investing in future technologies, in practice, it can be a frustrating process: For example, we now know an enormous amount about alternative sources of energy; but we still have a long way to go to find a way to power a city efficiently using wind and solar power, let alone a single car running all day on safe battery

power. Nearly all American schools are wired for broadband; but finding a way to use digital content and emerging social networks to craft young minds is not yet a well understood teaching paradigm. We all know that technology has the potential to revolutionize the way that healthcare is delivered, yet we cannot even agree on common standards for electronic medical records.

Solving these problems will be challenging and exasperating. But there is good news even before those solutions are discovered. Simply pursuing these challenges will improve us. That is the critical point. We have to invest in the pursuit before the solutions are clear in order to progress. There is an old adage in sports: you can't win if you don't show up. The same is true for these grand challenges of our time. In fact, for any nation in the 21st century, but particularly for the United States, supporting a true culture of investment is the key to long-term success. What do I mean by a "culture of investment"? It begins with common understanding that good investments ought to lead to ideas and discovery...which spawn new businesses...that in turn create new jobs...and ultimately leads to wealth creation and higher standards of living.

The start of this cycle is investment. Investment by government. Investment by business. Investment by individuals. We will argue about the size, timing, and return on the investments we make. But on this much there has to be agreement: If we are committed to investing in ideas to *improve*—not just *maintain*—what we have and what we know, the United States will do more than just recover from this recession. We will emerge, once again, as a competitive, global powerhouse. This is the essential stimulus plan we need—not one that attempts to shore up the status quo or delay the inevitable changes needed.

It won't surprise any of you that I believe that the world of technology lies at the heart of creating this future. The invention of the silicon transistor 61 years ago set into motion a chain reaction of unprecedented progress and wealth creation that has kept America at the center of the global economic stage. These microscopic building blocks inspired Moore's Law, which has delivered technology that gets significantly more capable and yet costs less year after year.

At Intel, we see this pace of discovery continuing for the foreseeable future. In fact, some of the most interesting breakthroughs in technology we see today are just the tip of the iceberg: Powerful computing and communications devices that deliver the full Internet and fit in your pocket. Computers so inexpensive that the poorest villages in Africa can have them in their classrooms. High-tech sensors that replace the role of full-time nurses caring for the elderly. Smart networks of microprocessors, software, and sensors that will eventually re-engineer the electrical grid.

The truth about technology is that it is constantly building on ideas that came before it. This is a critical distinction if we are going to think about "investment" in the right way. All the breakthroughs I've just mentioned are not one-off products. They are platforms on which thousands of other innovations will be built. That is the model that drives us at Intel. It is the model for the technology industry. And it ought to be the focus of what we do when we talk about stimulating the economy and remaining competitive as a country. Who will deliver these innovations? No one knows. We're working on many of them at Intel. But I've been around long enough to know that the next big breakthrough may come from companies we've never heard of,

or industries that haven't been invented yet, in places we least expect. Remember that the microprocessor was invented in a former prune orchard in a lazy agricultural valley less than four decades ago.

By definition, competition is fraught with uncertainty. But one thing we do know is that staying competitive requires a consistent commitment to investing in the future. I'm proud to say that at Intel we have long been willing to back our words with billion-dollar investments. I believe the United States has the potential to remain the world's leading innovator—a statement that, to read the press, is increasingly in doubt. Contrary to conventional wisdom, I believe that we *can* retain a vibrant manufacturing economy here in the United States. But we need to focus on industries of the future. Ones in which we can command a competitive advantage.

Intel is a global company today, and proudly so. Yet, we still think of ourselves as a prime example of American enterprise in the 21st century. Seventy-five percent of Intel products today are sold outside the United States. Yet, we still build 75% of our products in U.S. factories, and more than half our employees work here. And 70% of the dollars we devote to research and development and capital investment are spent here in America. We believe in this country. We believe in its power to create a future that will promote long-term growth. We believe that *we* can help to create the future. Since 2002, we have matched that commitment with our investment: Putting more than \$50 billion to work right here in America, in plant and equipment and research and development. Those investments support over 45,000 Intel high-tech jobs in this country. And tough as these times are, we are not blinking. Today, I am pleased to announce our intention to stamp the words, "Made in America" on even more Intel products in the months and years to come. Today, we are announcing that Intel will add to its already large factory network with our largest-ever investment in a single-process technology...and it's in the U.S. We will invest \$7 billion into factories in New Mexico, Arizona, and Oregon to manufacture silicon wafers with the world's most advanced 32 nanometer process technology.

These factories—we call them "fabs"—will produce the most advanced computer technology in the world. These are remarkable sites of innovation. Many Americans think manufacturing means gritty assembly lines and smokestacks. Let me give you a glimpse inside our fabs to show you manufacturing at its finest <VIDEO>. As you can see, these factories are truly remarkable, and we believe that they will produce chips that will transform what is possible. They are platforms for future creativity. Our customers will use them to build world-changing technology. Of course, these factories also support jobs: high-wage, high-tech manufacturing jobs that are the economic engines of the states where they are located. The investment will also support thousands of contract jobs for technicians and construction workers. These factories will also incorporate breakthroughs in environmental impact. They will recycle more chemicals, reclaim more wastewater, and have half of their power supplied from renewable sources.

As a global company, we have made a conscious decision to expand these factories here because we believe that investing in the future of American discovery isn't just the right thing to do—it is an essential business decision if we want the United States to continue to be the engine of new ideas and technical leadership. This is what investment means. Putting capital to work not

just for the new products you will produce, but also for creating the capacity for innovation we haven't yet imagined. If investment is going to make a difference, it has to lay the groundwork for the future.

As an American manufacturer, I want this idea about investing for the future to be better understood and embraced by other industries and our lawmakers. That is why Intel is beginning a year-long initiative to bring together some of the world's best minds in business, entrepreneurial circles, academia, the media, and government to lead a discussion on how technology investment can help grow the economy and create jobs. We will do this in partnership with the Aspen Institute. I am very happy that Walter Isaacson, the President of the Aspen Institute, is here with us today. We will share details about our partnership soon.

Let me conclude with a little bit of advocacy: This year, we are going to see an unprecedented level of public investment in schools, bridges, roads, and healthcare. It is important. It will make a difference. It is long overdue. But let me be very clear. All that investment is not sufficient. While it may help lift us out of our current crisis, it will not secure our future. By itself, it won't help stimulate the next generation of ideas. A secure future requires investment in areas that will give rise to new ideas and new industries. We can't look to government to do this. In fact, creating the future is an area where American business and entrepreneurialism has a stellar track record, one that I believe we can continue.

What I am asking is that other companies join us. Companies that are willing to step up now and place investments to lay the groundwork for our future. Yes, it's important to deal with the realities and inefficiencies of today. But it is essential for the well being of all of us that we make a collective investment in tomorrow. Thank you.

QUESTIONS AND ANSWERS

QUESTIONER: How many jobs will be created by the announcement you made today, and when do you think that these facilities will be completed?

MR. OTELLINI: The investment will span 18 to 24 months, in most cases the factories are being retooled as we speak, in some cases there is incremental physical construction in addition to the equipment in lines, but it will all be up and running and peaked within 24 months. We'll employ about 7,000 Intel employees in these factories, and the number of construction workers and contractors is in the multiple thousands.

QUESTIONER: You said you are making a conscience business decision to do this. Are there risks associated with that, and could you have done it elsewhere more cheaply?

MR. OTELLINI: The answer is no and yes. It is not a risk in the sense of the construction itself or bringing up the technology. We have proven that out, and the only element at risk is what is the global demand for these products. We have an unfaltering belief in technology, therefore, we have a belief that these technologies will be something people want to buy, they will be cheaper, better, faster, so in that context we have high confidence.

Relative to doing it more cheaply elsewhere, these factories, the fabs, are not driven by labor costs. So doing it in a lower cost wage area would not save significantly a large amount of money. On the other hand, other countries offer significant incentives in terms of taxes and equipment rebates in the hundreds of millions, if not billions of dollars. It's a \$4 billion factory from a Greenfield perspective. The U.S. doesn't do that. Some of the states offer small amounts of money, but we thought, on balance, that having the technology here, being about to use our existing workforce, the existing site infrastructure, and so forth, allowed us to bring these up much faster and outweighed any of the offsetting costs.

QUESTIONER: I assume the President is very glad to hear about this kind of investment in our country. Have you had a chance to talk to the President about this?

MR. OTELLINI: Yes I have. He called me last night at the Hay-Adams after he got back from Indiana and wanted to congratulate us on this announcement. We talked a bit about it and what it meant. He reminded me that he sees the Intel logo every morning when he opens up his laptop. I was pleased to hear that. We talked a little bit about the stimulus package, as you could imagine. I told him I thought there were many elements of it that I could get behind. In particular, health IT, the alternative energy investments, rebuilding the classroom infrastructure, broadband investments, funding for the NSFS, those kinds of things are spectacular. And they meet the criteria I talked about in terms of defining true investments.

QUESTIONER: To finance the buildings of these new facilities, you'll need some debt financing, presumably. Do you have any problems in getting that financing, or have you already worked it out?

MR. OTELLINI: We don't need to borrow for this. We have \$15 billion in cash. Our cash flow, even in this environment, is quiet good. So we have typically paid for all of our factories out of cash, sorry to all the investment bankers here.

QUESTIONER: What country in the world do you actually consider to be the best to do business with, and do you think the United States is in danger of losing its leadership position as a great country to do business with?

MR. OTELLINI: There's a loaded question. I think, all things considered, this is still the best. I mean despite the things we all agonize over, the quality of the education system here, particularly in the graduate schools where we hire the majority of our people is second to none. Intel has 40,000 technical degree employees, 4,000 PhDs, 12,000 masters degrees in sciences. So you look at that in terms of what our education system can turn out, and even though they are not all native-born Americans, the ability to attract and retain them and give them good jobs here still is very, very positive, despite all the other incidentals that go around.

In terms of the climate for market growth, I would have to point to the emerging markets of India, China, Brazil, and Russia; the brick countries. They still are the fastest growing markets in the world. The United States is the largest market for computers in the world. China is the

second largest; it has now passed Germany and Japan, and China will pass the U.S. within a few years, simply because of the law of large numbers.

QUESTIONER: You're on the Google board. How do you compare the cultures of Intel and Google and how do you believe they are responsible for the respective successes of those companies?

MR. OTELLINI: Intel, as you can imagine from the video of our factories, is a company of zero defect tolerance. Everything we do has to be precise at levels beyond imagination, both in the way we build our products and in the way we design our products. Can't have a computer that doesn't work, it gives you the wrong answer. And that level of vigor requires many, many years to bring a product out, close to billions of dollars to bring products out, and then you win by the scale investment.

The Google culture, because of the nature of their product line, is entirely different, it's almost reverse. It's a culture of instant innovation. It's a culture where you don't need 3 years to build a chip to have a new product; you simply get five guys and post something on the web as a beta product tomorrow, and if it works you have a new product. You have a different kind of thought process involved. Ours is much more broadly based. I think there is much more the culture of innovation at the individual level.

QUESTIONER: How will Intel technology be able to help in the alternative energy area, and will you be able to use that technology in manufacturing solar panels?

MR. OTELLINI: The most obvious one is the one I mentioned in my speech, which is the U.S. Electrical Grid and perhaps the Worldwide Grid, which is really dumb. It's an archaic grid, early 19th century architecture. The ability to harness some of the inefficiency of that grid and use smart sensors and smart distribution technology is really the number one thing that can happen short term, in terms of improving the overall consumption of energy.

Beyond that, thin film work and things like battery technology to improve batteries for things like electric cars, is something we are looking at. We are not making any announcements there today. In terms of building solar panels, the technology is quite different. The factories are different, yes they are made out of silicon but it is a different kind of silicon. It's a linear, much less clean environment. You don't need all the automation we have. It's much less precise. So we spun off a business to do solar panels, but we are not going to make it a mainstream business for ourselves.

QUESTIONER: Andy Grove famously said only the paranoid survive. Do you agree with that, or do you have a different philosophy of life?

MR. OTELLINI: How could you not? Yes I agree with it. Not just because Andy was my friend and mentor, but it defines our business cycle. Someone asked me before about our product cycles, and I mentioned in December of every year 90% of the revenue we get in that December comes from products that we were shipping January of that same year. So our whole business

model is to cannibalize ourselves in terms of our new products. You know, if you don't have a better product, why would you buy a new computer? So the idea is intrinsic to our business model. And also built into that is the idea that, if there is something that is technologically possible and you don't do it, someone else will. The combination of those two drives a healthy degree of paranoia.

QUESTIONER: How do you compare the quality of young engineering students you're recruiting in the United States versus India, China, and other places in the world?

MR. OTELLINI: As I said, the U.S. graduate schools in the physical sciences are head and shoulders above anything else I've seen. Unfortunately, half the seats in those schools are occupied by non-Americans. And when they graduate, we say thanks very much, you can't have a visa, and then they go away. Companies like Intel with a global reach can hire that person in their home country, because we have the scope. Other companies may not have that. So I think it's a problem for America. I do see the quality of graduate education increasing pretty dramatically, particularly in China in the physical sciences, in terms of number of engineers being graduated, and so forth, and they are getting better and better and better every year. I am not smart enough to know when there is a cross over or a catch up, but that day will happen.

QUESTIONER: What is your view on the current stimulus bill, and do you support that bill as currently constructed, or do you have any suggestions for improvements?

MR. OTELLINI: In the aggregate, I think, at the essence of an economic problem or crisis is confidence, and confidence comes from a number of things. I think it's incredibly interesting to see that the U.S. savings rate, which has been negative for quite some time, is up to 2.8%. People, as you expect, who have the means to do so are going to save more right now. That saving increases liquidity. I think that the government's stimulus plan, which includes large amounts of things that I consider investment-grade spending, is very good and will open up the spigots there. I am hoping as that confidence from that saving rate, liquidity improvements, and things that the government is doing, and things that companies like Intel are doing, all lends rise to rebuilding confidence and getting people back to betting on the future again. At the end of the day, this is all about confidence.

QUESTIONER: What do you see as the leading technological breakthroughs in the semiconductor industry over the next several years that you can anticipate?

MR. OTELLINI: This technology that we are investing in right now is, I think, the most amazing thing I have seen in my three and a half decades at Intel and in the industry. For many, many years, Moore's Law represented faster computers; you got a new microprocessor, the performance doubled every 18 to 24 months. We all saw that going from 286 to 386 to 486 to Pentium. Many of us lived through that. The level of technology that we are able to develop now at 32 nanometers, the video had it there, 32 nanometers means you can put 60 million transistors on the head of a pin. So we can build chips with half a billion transistors on them that are very, very cost effective, that consume very little power, and that are tiny, and they fit into devices that fit into your pocket or that get put into any type of embedded system around the world. So I think

what this technology will do is usher in a new era of what we call in the industry SOC, or system on chip.

Today, when you buy a computer, there are a lot of chips inside it. As the technology allows you to shrink, you can put all those chips onto one chip. That lowers the cost, lowers the power, and makes them smaller. But it doesn't make them less powerful. So I think you will see within the next 3 to 4 years, coming out of these factories, industry-shaping technology that will change the way we all interact with computers around the world.

QUESTIONER: Who do you see as your major competitor; U.S. semiconductors manufacturers or foreign semiconductor manufacturers or other companies?

MR. OTELLINI: In the manufacturing side, there are really two other companies that are still invest at a global scale like Intel, one is Samsung out of Korea and the other is a company called TSMC which is a foundry in Taiwan. Many of the other companies are finding allegiances or consortiums to go together. It's simply the economics. If you take those factories that I described, they are roughly \$4.5 billion to build a factory like that, 2 or 3 years to build it. When you have it up and running, you need to generate \$5 billion to \$6 billion a year of revenue out of it at 50% margins to be able to pay for it. Most of the semiconductors industry is not \$5 billion a year in total revenue, in terms of the companies. So it leads to a consolidation into places like foundries or consortiums. I think you can see that shake out happen in the industry, particularly in these dire times.

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PAUL S. OTELLINI

Paul S. Otellini is president and CEO of Intel Corporation, the world's leading manufacturer of microprocessors for personal and business computing. Intel technology is creating new ways for the world to work, learn, and play by extending the reach of the Internet and solving business problems. Since joining Intel in 1974, Mr. Otellini has managed several Intel businesses, including the company's PC and server microprocessor division and the global sales and marketing organization.

In 2002, Mr. Otellini was elected to Intel's board of directors and promoted to president and chief operating officer. He was named CEO in May 2005, a role in which he's focused on driving the company's growth and mission to deliver innovative, energy-efficient products. Under Mr. Otellini's guidance, Intel also aims to usher in a new era when portable wireless computing is available anytime, anywhere. The company also is focused on bringing the next billion people online with affordable computers tailored to their needs. Mr. Otellini received a bachelor's degree in economics from the University of San Francisco in 1972, and an MBA from the University of California, Berkeley in 1974. Mr. Otellini serves on the board of directors of Google Inc.