PREPARED STATEMENT OF INTEL CORPORATION

For the

COMMITTEE ON SMALL BUSINESS
OF THE U.S. HOUSE OF REPRESENTATIVES

On

LARGE AND SMALL BUSINESSES:
HOW PARTNERSHIPS CAN PROMOTE JOB GROWTH

Robert E. Bruck
Corporate Vice President and General Manager
Technology Manufacturing Engineering Organization
Intel Corporation

March 28, 2012

Intel Corporation respectfully submits this testimony for the record in conjunction with the Committee's hearing on "Large and Small Businesses: How Partnerships can Promote Job Growth." As once a very small company and now a Fortune 50 company, Intel has indeed experienced shared significant growth with both its customers and suppliers.

I. Evolution of Intel and the U.S. Semiconductor Industry

1. Intel's Humble Beginnings

In 1968 Robert Noyce and Gordon Moore, two scientists who helped build Fairchild Semiconductor, decided to leave that company and form their own business to manufacture semiconductor memory products. Soon after, a third visionary named Andy Grove, a Hungarian immigrant, joined the team. The new company, Intel Corporation, began with 12 employees, limited cash and $2.5 million in venture capital.

From the beginning, Intel has been an innovative semiconductor component manufacturer dependent on sales to business customers known as original equipment manufacturers (or OEMs) that have had their own innovative product ideas. In 1969, Intel developed its first random access memory product. Shortly thereafter, a Japanese calculator manufacturer (Busicom) sought a custom multi integrated circuit calculator and opened up a brand new market for microprocessors, the importance of which was little understood – even by Intel – until years later. In 1971, Intel developed the world's first EPROMS and microprocessor (the 4004 chip), but the latter product didn't take off until the personal computer (PC) was born.

As with all small businesses, Intel also had a few failures (e.g., digital watches in 1972). In 1981, IBM adopted Intel's 8088 chip for its own line of PCs. A very large customer even at that time, IBM provided the consumer demand and additional revenue, along with an important source of investment capital, that Intel needed to expand our own capital and R&D investments for continued improvement in integrated circuits.

In 1985, Intel stopped making semiconductor memory products due to significant competition by much larger manufacturers subsidized by several Asian governments, and began focusing exclusively on the development of microprocessors where competition was nascent. That critical decision enabled the explosive growth that led to the company Intel has become.

2. Intel Today

:

Intel is the world's largest semiconductor manufacturer by revenue, and is a leading provider of computer, communications and networking products. We have approximately one hundred thousand employees worldwide, with more than half of them based in the U.S. Our revenue last year was about $54 billion, generated from sales to customers in more than 120 countries.

While three quarters of Intel's manufacturing capacity is located in the U.S., more than three quarters of our revenue is generated overseas. The revenue we generate outside of the U.S. helps create and sustain our high paying jobs at home and positively impacts our entire U.S. supply chain.

We have more than 10,000 suppliers worldwide, with more than 6700 (or greater than two thirds) of them classified as small businesses. About 5,000 of our total suppliers are U.S. based, and more than 2,200 of those are small businesses. Intel spent more than $3 billion in 2011 on goods and services purchased from U.S. small businesses in industry sectors that vary from the supply of chemical gases to the supply of construction services. The general types of goods and services provided by small businesses are listed in the table below.

Summary of Types of Goods & Services Provided to Intel by Small Businesses

ADVERTISING	CONSTRUCTION SERVICES	GAS	MATERIALS SERVICES	REAL ESTATE
AIR	CONTROL AND LIFE SAFETY SYSTEMS	GLOBAL TRANSPORTATION	MATERIALS (POLYMERS, METALS, QUARTZ, ETC.)	SECURITY
BENEFITS	ELECTRICAL	INTERNET MARKETING	MEDIA	SILICON
CALL CENTERS	FACTORY SERVICES	LEGAL SERVICES	NETWORK/TELECOM	SOFTWARE
CAPITAL EQUIPMENT	FOUNDRY	LODGING/MEALS/ TRAVEL	OFFICE PRODUCTS	SPARES
CHEMICALS & GASES	FULLFILLMENT	LOGISTIC	PRESS RELATIONS	TECHNICAL CONSULTING
COMPUTING HARDWARE	FURNITURE	MARKET RESEARCH	PRINT & DESIGN	TEMPORARY SERVICES

Semiconductor manufacturing is extremely expensive requiring significant capital expenditures, R&D, exotic materials science, extremely sophisticated manufacturing tooling, complex construction technology for mega factories, and a vast variety of services. Our R&D expenditures in 2011 alone were $8.35 billion and our capital expenditures that same year were $10.8 billion. A leading edge factory now costs more than $5 billion when fully equipped, and with a new technology generation developed every two years, many of the tools used (constituting more than two thirds of total factory cost) are replaced with new tools designed to make ever smaller transistors.

Even during the strained economic climate of the last few years, Intel has continued to invest to stimulate economic and job growth. In February 2009, the company announced a $7 billion upgrade to its manufacturing facilities in Oregon, Arizona, and New Mexico—projects that are helping to maintain approximately 7,000 high-wage, high-skill U.S. jobs while providing 4,000 contract jobs for technicians and construction workers.

In 2010, Intel announced that it will spend an additional $6 billion to $8 billion over the next several years to bring next-generation manufacturing technology to several existing factories across the U.S. and to build a new development factory in Oregon. This new investment will support approximately 6,000-8,000 additional U.S. construction jobs during the building phase, and eventually add approximately 800-1,000 Intel high-skilled, high-wage jobs.

And in 2011, Intel announced plans to invest more than $5 billion in a new chip manufacturing facility, called Fab 42, in Chandler, Arizona. The new fab will create thousands of construction and permanent manufacturing jobs at Intel's Arizona site.

We have spent more than $68 billion on U.S. operations, manufacturing and R&D, from 2002 to 2011. Most of the product manufactured from our U.S. investments will be sold to the 95% of worldwide consumers that live overseas.

Intel's operations have had a major economic impact on the U.S. economy. In 2008, we commissioned IHS Global Insight to conduct an independent study of Intel's longer-term economic impact in the U.S. The study calculated Intel's economic contributions based on four layers of impact. The first three layers measured the direct, indirect, and induced effects of Intel's own operations, and the fourth layer considered productivity gains throughout the economy that stem from the use of Intel® microprocessors. The study found that between 2001 and 2007, Intel contributed $758 billion to the U.S. gross domestic product (GDP). Of this total, $458 billion was stimulated by Intel's operations, and $300 billion was attributable to Intel's productivity-based impact across a multitude of industries that use our microprocessors.

We periodically conduct local assessments to better understand Intel's direct and indirect economic impact on the specific communities where we operate. For example, Intel commissioned a group called ECONorthwest to prepare an economic impact assessment of our Oregon operations, our largest manufacturing site. Published in October 2011, the report found that "total economic impacts attributed to Intel's operations, capital spending, contributions, and taxes amounted to almost $14.6 billion in economic activity, including $4.3 billion in personal income and 59,990 jobs in Washington County, Oregon."

All of these economic benefits are entirely dependent on the continuous development of innovative semiconductor products. As explained in Section II below, Intel relies heavily on research collaborations with universities and relationships with a wide range of suppliers to develop and commercialize some of the most advanced products in the world. Collaborations with small suppliers are critical in this process.

3. U.S. Semiconductor Industry Profile

The rest of our industry relies on a similar ecosystem. Semiconductors have been, on average, the top U.S. export for the last five years; these sales have fueled tremendous growth within the entire U.S. industry supply chain. Today's semiconductors enable computers, smart phones, automobile systems, the smart grid, household appliances, medical imaging devices, factory robotics, internet communications, gaming platforms, and satellites, among other downstream commercial products. Here are relevant data for the entire industry:

- 2011 Sales = $153 Billion
- 2011 Market Share = 51% of $300 Billion World Market
- U.S. Jobs = 189,000
- Average Income = $111,772
- Percent of Sales Outside U.S. Market = 82%
- R&D Investment = $20 Billion, 17% of Total Sales
- Capital Equipment Expenditures = $13 Billion, 11% of Sales

As discussed in the next section, the success of the semiconductor industry is due to continuous technological advances built upon robust research and development. Semiconductor

innovations form the foundation for America's $1.1 trillion dollar technology industry affecting a U.S. workforce of nearly 6 million, according to the Semiconductor Industry Association (SIA).[1]

This workforce is comprised of vast network of small and medium enterprises (SMEs), including equipment manufacturers, contractors, and other suppliers to the chip industry, software designers, network administrators, cloud computing specialists, web developers and content editors, medical imaging technicians, information technology service personnel, and desktop publishers, among others. The 6 million employee figure does not include all of the jobs that are made more productive or enhanced by IT— for example, pharmacists who check drug interactions, doctors who have access to real-time medical data of their patients, auto mechanics that utilize internet diagnostic tools, real estate agents who use computer listings and virtual tours, and on-line retailers, to name just a few.

In brief, our dynamic industry creates hundreds of thousands of opportunities for small businesses. Our industry's global supply chain is complex and multi-tiered. Small businesses not only directly supply other large semiconductor manufacturers, they also service the research consortia that are funded by the federal government and large manufacturers.

II. Intel's Constant Drive for Innovation Creates Small Business Collaborations

1. Scope of Our Research, Development and Manufacturing (RDM) Model

Due to the extreme complexity of leading edge semiconductor products, research on the materials, design and process technology needed to make new products begins five to ten years before they enter into high volume manufacturing. This research is done both externally outside of our company and within Intel.

Specifically, whereas companies internally carry out primarily nearer-term research and development, the longer-term fundamental science research that underpins new technology breakthroughs and paradigm shifts are largely performed at universities. "Basic research" is funded with help from the federal government.

A. *External Research*

Basic university research adds to the body of knowledge from which *all* companies benefit and which no one company (large or small) can afford alone. In addition, university research is the avenue by which scientists and engineers are educated and trained for careers in technology. These careers include working in small and large businesses, government labs, academia, and in many cases, self-started companies buttressed by research results that are later commercialized through technology transfer.

Long-term fundamental science research performed at universities and funded by the industry and the federal government is critical to sustaining the pipeline of new discoveries that will fuel the semiconductor industry, our Nation's economy and new job creation in America.

[1] *See* Semiconductor Industry Association (www.sia-online.org).

The Science Coalition (TSC) recently published a report entitled, "Sparking Economic Growth: How federally funded university research creates innovation, new companies and jobs."[2] The report documents how 100 companies, many of which are characterized as SMEs, have immensely benefited from investments in university basic research. The report states: "Innovation fueled by basic research has been a cornerstone of the U.S. economy for the last half-century, leading to the creation of countless companies, technologies and products. Federally funded university-based research is essential to America's ability to produce innovation." The testimonials and data included in the study lead one to conclude that strategic federal investments in basic research and public-private partnerships benefit small, medium, and large entrepreneurs alike.

Basic, pre-competitive research that benefits the entire semiconductor industry, both large and small companies, involves three critical research and development consortia: Nanoelectronics Research Initiative (NRI), The Focus Center Research Program (FCRP); and the Global research Consortia (GRC).

NRI, managed through the Semiconductor Research Corporation (SRC), supports university research finding a replacement technology to allow faster, smaller, more energy efficient devices beyond the limits of today's semiconductor technology.

- In addition to Intel, other semiconductor industry companies like Global Foundries, IBM, Micron, and Texas Instruments contribute millions of dollars annually to the NRI effort. With government and university contributions, these funds are leveraged for a combined total of approximately $20 million annually for NRI that support nearly 40 universities, 75 professors, and 150 students in 20 states.

- In addition to directly supporting the NRI centers, the National Science Foundation (NSF) accepts NRI funding for projects at the NSF Nanoscience Centers across the U.S., which not only leverages NSF's large investments to fuel basic science and support students, but also helps promote research in relevant areas for future nanoelectronics innovation. These NSF related funds total about $40 million per year.

- The National Institute of Standards and Technology (NIST) also directly supports the four NRI multi-university centers and lends its metrology expertise. Advancing nanoelectronics requires measuring structures with atomic accuracy, characterizing new materials and molecules, and even measuring the signals from individual electrons.

- State governments in California, Indiana, New York, and Texas and the City of South Bend also invest in the NRI in recognition of the significant employment benefits that will follow commercialization of nanoelectronic technology.

In addition to NRI, since 1997 the Department of Defense and the U.S. semiconductor and supplier industries have jointly funded university research through the Focus Center Research Program (FCRP). By focusing on mid- to long-term research projects of great interest

[2] http://www.sciencecoalition.org/successstories/fullReport.cfm.

to our national defense and the semiconductor industry, FCRP projects help maintain U.S. leadership in a technology vital to U.S. prosperity, security and intelligence.

The third consortia, GRC, funds nearer term research and benefits from local collaborative funds from the states of New York and Texas among others.

In addition to Intel's contributions to the NRI, FCRP and GRC projects, our company funds a wide range of other university research. Intel's total investment over the last five years in such collaborations has been about $250 million. This collaborative research often produces spin off technologies of use outside of the semiconductor industry that small businesses can commercialize.

B. *Internal Research and Development*

The results of pre-competitive research are then combined with internal research and used by semiconductor companies in the competitive, development phase. Intel spends anywhere from 13% to 15% of its annual revenue on research and development. As noted earlier, Intel R&D expenditures for 2011 alone exceeded $8.3 billion. At this stage, small businesses play a critical role in experimenting at the edge of technology development. Larger suppliers often are more reluctant to explore unproven technologies because they have their hands full meeting robust quality and reliability targets for products introduced into high volume manufacturing.

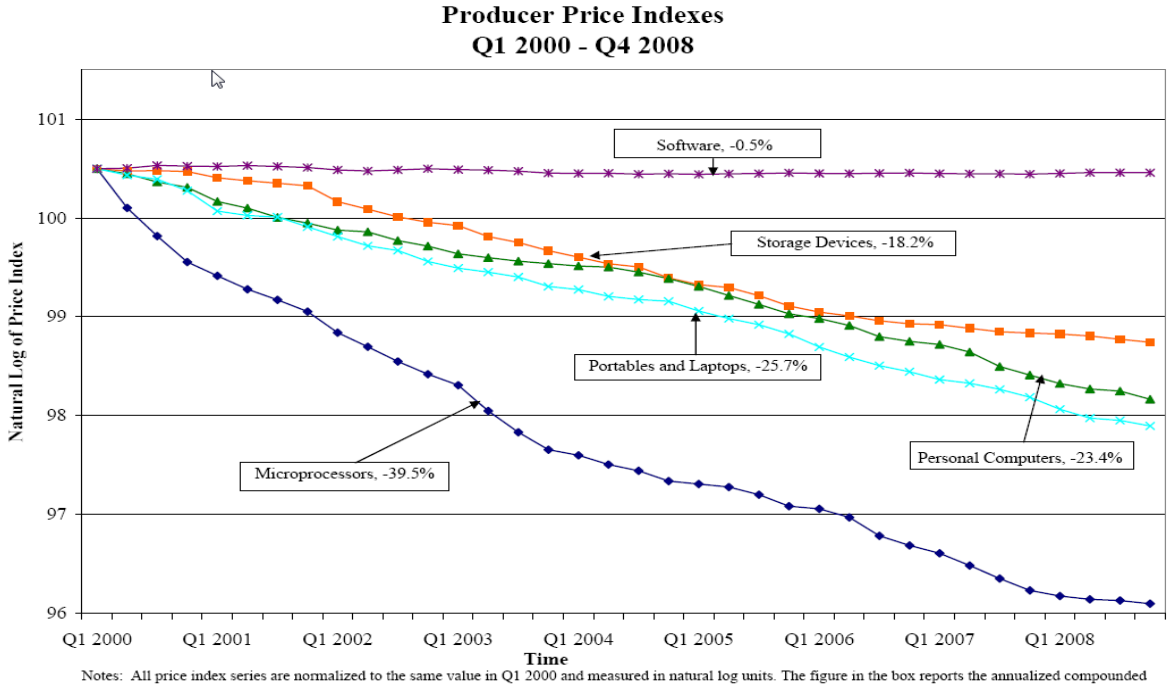
Energetiq Technologies, which also is testifying in this hearing, is a prime example of the mutual benefits of Intel's collaboration with small businesses to develop critical technologies. Intel encouraged Energetiq, with both technical and financial assistance via an investment from Intel Capital, to develop new sources of light for EUV lithography that is critical for future process technologies used to manufacture leading edge microprocessors. In addition, Energetiq's laser driven light source (LDLS) technology is incorporated into the inspection and measurement tools of some of Intel's largest capital equipment suppliers to aid in the detection of defects on silicon wafers as they pass through the chip manufacturing process. As a result of the technical and investment relationship with a small company, two technologies critical to the manufacture of Intel's present generation and future generation semiconductor chips have been developed and commercialized. Energetiq, for its part, has benefitted not only from the revenue generated by sales to Intel's suppliers, but its relationship with Intel provides significant credibility with its customers, suppliers and other investors enabling it to enlarge its business.

2. Results of Our RDM Model

The semiconductor industry is dynamic. Microprocessor manufacturers like Intel have to develop new features, conduct complex materials science integration research, analyze and improve researched topics to develop reliable / low-cost manufacturing techniques, increase computing speed, lower power usage, and drive down overall costs, including environmental costs, to remain competitive. Large computer makers -- some with two to three times Intel's annual revenue -- exert significant buying power over microprocessor companies.

Intel and its suppliers are on a constant innovation treadmill that has produced extremely impressive economic results. In the last 10 years, the average price of Intel's microprocessors for personal computers has fallen approximately 60 percent.

Due to significant technological improvements brought about by Intel's RDM model, the real cost of processing power has dropped roughly 40% *annually* between 1998 and 2008 (see chart below). This is significantly greater than the usual drop in tech product prices. In fact, the quality-adjusted price of microprocessors has declined more than any of the 1,200 products tracked by the Department of Commerce. Computing power that cost $1 in 2000, now costs less than a penny.



Notes: All price index series are normalized to the same value in Q1 2000 and measured in natural log units. The figure in the box reports the annualized compounded quarterly rate of price change from Q1 2000 to Q4 2008 in percent per year. Data are not seasonally adjusted. Data for Q3 and Q4 2008 are preliminary.

Sources: U.S. Bureau of Labor Statistics producer price index, series identification numbers PCU33441333441312 (Microprocessors), PCU33411233411121 (Computer Storage Devices), PCU33411133411173 (Personal Computers), PCU33411133411172 (Portables and Laptops), and PCU511210511210 (Software). http://data.bls.gov/cgi-bin/dsrv?pc, accessed on January 20, 2009.

3. Intel Capital Investments in Small Businesses

In 1991 our company formed Intel Capital, now one of the largest venture capital organizations in the world. Intel Capital's mission is to enhance Intel's strategic objectives by making and managing financially attractive investments in external companies. Intel Capital fulfills this mission by making investments in companies that will fill gaps in our technology roadmaps, by making investments in companies that provide technology that will stimulate demand for Intel products, and by making investments in adjacent market segments. Energetiq Technology Inc., referred to earlier, is a prime example of the first kind of investment – i.e., a company Intel Capital invested in to develop specific light source technology necessary to implement EUV lithography.

Since its inception in 1991, Intel Capital has invested $10 billion in more than 1,200 high tech companies. Many of those 1,200 companies were small businesses at the time of investment and over half of the investments were made in the United States. Intel policy does not allow publishing of detailed financial information beyond our corporate annual financial

report, but a significant part of the more than $3 billion spent in 2011 on small businesses came from Intel Capital investments.

On top of its own investments, in 2011, Intel Capital pledged to invest an additional $200 million in U.S. technology companies in support of a new White House initiative, Startup America, and we joined the Startup America Board of Advisors. Startup America was established to inspire and accelerate high–growth entrepreneurship throughout our nation (see http://www.whitehouse.gov/economy/business/startup-america).

In addition to the Intel/Energetiq relationship discussed earlier, the following two case studies illustrate the type of investments Intel Capital makes in many of the more than 6,700 small business suppliers that support Intel's operations.

A. *Case study: Crossing Automation*

Today, Crossing Automation (www.crossinginc.com) is a leading designer and manufacturer of fab and tool automation products used by the foremost semiconductor device and equipment companies and is leveraging its technology to serve the emerging HB-LED and solar markets. The company employs approximately 180 employees worldwide, with over 66% of the employees in Fremont, California. Crossing is profitable and performs better than all of their industry benchmarks.

Between 2005 and 2008, Intel Capital and Tallwood Ventures invested approximately $15 million in Crossing to foster the company's development of their products. In 2009, the company had the opportunity to purchase part of the assets of Asyst Technologies. Asyst was a leading US based supplier of automation products and a 2009 Intel Preferred Quality Supplier Award Winner, so they were one of our best suppliers. However, Asyst was carrying a lot of bank debt from an acquisition, and when the 2008/9 financial crisis hit, the company was very quickly forced into a cross border bankruptcy, which had the potential to dramatically impact Intel's supply chain and manufacturing schedule..

Intel Capital and Tallwood Ventures intervened by investing approximately $7 million into Crossing to finance the purchase of the assets of Asyst Technologies out of bankruptcy. Intel Capital collaborated with our internal Technology and Manufacturing Engineering Group to temporarily provide favorable payment terms to the combined entity, providing an essential component to ensure the company's survival. The results of the company since 2009 have been impressive:

- About 180 Asyst and Crossing high tech jobs mostly located in Fremont, California have been saved as a result of the asset purchase. The combined entity has been profitable for 28 consecutive months and cash flow positive for the last nine quarters..
- The company has developed a very successful new wafer transport system product that combines the Crossing and Asyst's concepts.
- Intel has been one of Crossing's top 10 customers over the last 3 years, and we are considering its new product for our factories.
- Crossing Automation is a pioneer in 450 mm wafer transport solutions, a critical project for Intel, and has shipped three different products at this advanced wafer size.

B. *Case Study: Xradia*

Xradia (www.xradia.com), based in Pleasanton, California, is a leading maker of high resolution 3D, X-ray microscope systems, the only American company in this technology area. Xradia sells its products worldwide into the semiconductor, oil & gas, research, and life sciences market segments. The company had between $25-50M in revenues in 2011 and has approximately 85 employees, who are mostly based in Pleasanton.

Xradia's technology was originally developed at the Lawrence Berkeley National Laboratory, which is a Department of Energy laboratory managed by the University of California. The founder licensed this technology from those entities and formed the company in 2000.

In 2007, Intel Capital and other investors invested $7 million in Xradia. In 2011, Intel worked with Xradia and certain banks to get the company needed working capital at favorable terms. Since the investment in 2007,

- Investors brought in a new CEO to run company.
- The company has had a >30% CAGR.
- Over 50% of the company's revenue base is from international sources.
- More than 40 high tech jobs were created in Pleasanton, CA.
- Intel has supported the company through its purchase of Xradia's products.

4. Other Intel Initiatives Supporting Small Businesses

Small businesses typically need more than direct financial assistance to grow and develop. Other ways to assist them include the sharing of technical and investment know-how, business contacts, and assistance with education needs.

A. Intel Policy on Promoting Small Businesses and Supplier Diversity

As discussed in Intel's Corporate Responsibility Report, the company has a policy to promote business opportunities for small businesses and companies whose ownership has historically been under-represented in the supply chain. We feel strongly that this practice contributes to economic development among increasingly diverse and small business segments, and that it fosters healthy capacity building throughout the supply chain.

Intel is committed to promoting and encouraging the integration of small and diverse suppliers in all eligible areas of product and service procurement. To support these efforts:

- Intel recognizes small business ownership based on the Small Business Administration size standards, using the North American Industry Classification System (NAICS) to identify the industries; and
- Intel recognizes diverse business ownership as 51 percent owned/operated by a diversity owned individual(s).

The great majority of diverse businesses Intel works with today also qualify as small businesses. Intel's assistance to many small and diverse businesses encompasses other initiatives besides monetary investments and the purchase of their products.

B. Examples of Other Intel Efforts to Support Small Businesses

In 2005, 600 U.S. small businesses attended capability enhancing educational classes sponsored by Intel with a $350,000 investment. These courses on marketing, finance, operations and infrastructure were taught by an educational non-profit, offered at a low cost ($20) and made publicly available to any interested small business. Six months after attendance, attendees noted a 3% to 31% improvement in actual application of learned skills across all topics. In 2006, Intel's Sales and Marketing Group provided $1.5 million dollars for small business education.

Between 2004 and 2007, Intel's Supplier Diversity and Sales and Marketing teams worked together to increase supplier diversity. For instance, Intel's U.S. Small Business marketing team sponsored a program on SBTV.com where Intel participated in a panel explaining how small business can win large corporate contracts. The web programs Intel sponsored were viewed by over 50,000 individuals. During the same time period, in cooperation with Dartmouth University, Intel created a scholarship for the prestigious Tuck School of Business Advanced Minority Business Executive Program. Many of the scholarship award recipients continue as valued incumbent suppliers to Intel today.

Intel also has periodically provided networking opportunities to small and diverse suppliers with scholarships that facilitate their attendance at national advocacy conferences. As reflected in the following case study, we also often provide business advice to our suppliers.

C. *Case study: Assistance to Small Print Design Woman-Owned Business*

For over twenty years, Intel has purchased marketing materials from a small, minority owned visual communications business that has 19 employees and 2011 revenues were $3.2 million dollars.

To ensure this small business continued growing, Intel sponsored its owner/president to attend a one week executive program managed by Tuck at Dartmouth. As a result of this event, the small business implemented a new growth strategy to develop a new division that expanded services to include internet marketing. Through this expansion, a technical director and five developers were hired. The business successfully evolved beyond typical marketing design to re-architect its services for mobile applications and digital devices.

Continuing the trend to help the company further innovate, Intel extended the opportunity to this same small business to participate in product packaging design and in the production of the design for a microprocessor box. The scope of Intel assistance included help on how to reduce the use of materials and address environmental impact concerns. The supplier reached new customers and also won Intel's packaging contract award, demonstrating greater capacity to grow her business capabilities and increase employee job security. In brief, the business expansion and product innovation created other customers and decreased reliance on Intel, one of its major customers.

The following is a recent quote from the company's President related to her company's relationship with our company: "We have worked for Intel for more than 25 years. When the Intel Supplier Diversity and Small Business program took shape over a decade ago, we immediately experienced the value of its initiatives. Since then we've significantly expanded our services and capabilities, made new business connections, and more importantly, have learned how to build a better company. Intel has helped us showcase our capabilities and utilize our full resources. Knowing how to support large global corporations is now a cornerstone of the many things we offer to Intel and others." Last year, this same person noted: "Running any business has its challenges. But small, diverse businesses face even greater hurdles. Intel's Diversity Supplier program has helped our business prepare for opportunity, open doors, and cultivate new relationships."

III. Government Policy Considerations to Support Business Partnerships

Certain government policies facilitate an innovative and investment friendly ecosystem that can make it significantly easier for small businesses and small/large business collaborations to grow. The impact may be indirect, but nevertheless significant.

1. Pre-competitive Government R&D Funding

Intel applauds past Congressional support for increases to the research budgets at NIST, NSF and DARPA and welcomes the Administration's Fiscal Year (FY) 2013 R&D budget requests for these agencies. We also commend continued federal support of the SRC's Focus Center Research Program (FCRP) and Nanoelectronics Research Initiative (NRI) which involve over forty universities across the country.[3] Since its inception in 2005, the NRI R&D consortium discussed in Section II.1.A has produced 600 technical publications and 19 patent disclosures. Still, this basic research program is just beginning and the initial efforts are small compared to the government's research efforts in the 1940s and 1950s that led to the early semiconductor inventions. Nanoelectronics research must grow significantly over the next several years given the technical challenges our industry faces as we shrink transistors to sizes long thought unattainable.

These successful joint partnerships combine industry, government, and academic resources and talent to focus on major basic research challenges related to the entire semiconductor industry. They also equip the next generation of students with the tacit knowledge they will need to compete. Federal funding for basic research and public-private research partnerships at universities will benefit all companies, regardless of their size, while ensuring U.S. competitiveness in this strategic industry. While we acknowledge budget constraints, the federal government should prioritize research funding, as it will strengthen today's industry and lay the foundation for tomorrow.

2. STEM Education

Increasing the quality of science, technology, engineering and mathematics education is critical for our industry, large and small businesses alike. Intel relies on its internal talent and

[3] *See* Semiconductor Research Corporation (www.src.org).

the talent of its suppliers and consultants to help develop and commercialize the technologies we need to build improved products and remain competitive. In other words the availability of individuals with a high quality STEM education to work at Intel, with the research universities, and among our suppliers is essential to perpetuate the innovation cycle.

Private industry must work with government to provide the right kind of incentives that will persuade more students to obtain STEM related degrees. Our CEO, Paul Otellini, is a member of President Obama's Council on Jobs and Competitiveness. Mr. Otellini co-leads the Council's High-Tech Education Task Force that is focused on increasing the number of engineering graduates to help spur economic growth. As part of this White House task force initiative, Intel committed to double its engineering internships in 2012 (many of whom will go to small companies). Many STEM graduates and interns go on to form the small businesses that often take on the risks of developing unproven technologies.

3. Smart Immigration Policies

Until America can produce enough U.S. citizens with advanced STEM related degrees, it would really help U.S. technology companies if the U.S. government were to enact more flexible immigration policies for highly skilled workers that would enable them to more easily secure permanent residency. The significant contributions of highly educated entrepreneur immigrants are well known, including those made by Andy Grove to Intel and semiconductor manufacturing in their early days.

Due to a lack of U.S. graduates with advanced STEM related degrees, this issue has been debated at length among U.S. policy makers. Despite broad bipartisan agreement that it makes no sense to send foreign born graduates with advanced degrees back to their countries, however, little progress has been made to make it easier for them to stay in our country and provide the talent we need to spur economic growth.

4. Creating a Competitive U.S. Environment

Reducing unnecessary and time consuming regulatory barriers is more critical for small than large businesses. For example, the White House Startup America initiative mentioned earlier is working on accelerating the processing of patent applications. There are other impediments, however, to being able to quickly respond to market demands and that thus take away the advantage of small and more flexible businesses – for example, in the environmental arena where regulatory requirements are not always designed to preserve operational flexibility.

5. Creating a Competitive Federal Tax System

American businesses of all sizes face a competitive disadvantage in the global marketplace because of the U.S.'s outdated tax system. Other countries have reformed their tax code in response to the increasingly important role the corporate tax rate plays in investment and plant location decisions, and in spurring economic growth. Unfortunately, the U.S. tax code has failed to keep up with the changing global economy and the last significant overall of the tax code was in 1986, over 25 years ago.

On April 1, 2012, Japan will officially lower its statutory corporate tax rate, giving the U.S. the distinction of having the highest corporate tax rate in the developed world. Currently, the U.S.'s combined statutory rate stands at 39.2 percent which is more than 50% higher than the OECD corporate tax rate average of 25.1 in 2011.

It is critical that Congress enact fundamental tax reform and make the U.S. an attractive location for manufacturing and R&D investment and help American businesses (large and small) stay competitive in the global marketplace. Tax reform must focus on three important components: 1) an OECD competitive corporate tax rate of 25% or lower; 2) a territorial international tax system similar to the rest of world; and 3) a permanent and enhanced R&D Alternative Simplified Credit.

6. Increasing Market Access Benefits Large and Small Businesses

By using the rapidly developing global digital infrastructure, now more than ever small U.S. businesses can take advantage of foreign markets to grow their revenue and create more jobs at home to support sales overseas. As Intel has testified on various occasions, however, there are a number of emerging non-tariff barriers overseas that can impede U.S. business – especially small exporters that do not have the resources to deal with them -- and some of those regulatory barriers are affecting digital services and information flows across borders.[4] It is imperative that Congress provide USTR the necessary financial resources and other support to maintain open markets and increase market access where it does not exist.

[4] *See* Prepared Statement for the Record of Intel Corporation for the Committee on Ways and Means of the U.S. House of Representatives on "President Obama's Trade Policy Agenda and the Future of U.S. Trade Negotiations" (February 29, 2012); Prepared Statement of Intel Corporation Before the Committee on Finance, Subcommittee on International Trade, Customs, and Global Competitiveness, of the U.S. Senate on "International Trade in the Digital Economy (November 18, 2010).