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Innovation as Viewed from Within the Corporation

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About the Report: The Conference Board has recently undertaken a project on innovation and competitiveness, with funding from Microsoft Corporation. The goal of the project is to provide an overview of the current state of knowledge on the nature of innovation, and its role in stimulating economic growth and improved living standards in the U.S. The project draws on experts across the academic, corporate, and policy arenas, in addition to The Conference Board's own analysis, surveys, and focus groups of the business community. Such experts met in February 2007 to present and discuss various aspects of the innovation process and measurement thereof. Each presenter wrote a summary piece focusing on his respective area of expertise. These summary documents underpin the content in *Innovation and U.S. Competitiveness*; however the conclusions drawn are those of The Conference Board alone. These papers are retained for reference in The Conference Board Economics Program Working Paper Series.

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Innovation As Viewed From Within the Corporation[1]

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What is "Innovation"?

From the perspective of the corporation, innovation is undergoing a radical shift in meaning. Defining the directions of that shift is not a simple task. Approaches to innovation cover a wide range, from the traditional work of the company's R&D unit generating new product ideas, to assertions as broad as 'creating shareholder value,' or 'sustaining a competitive advantage.' Nevertheless, as the avalanche of press coverage over the past 18 months demonstrates (Business Week, Information Week, Forbes, Fortune, Wired, et al.), innovation, in whatever way it is understood, has moved front and center in corporate consciousness. Interestingly, exactly where this innovation consciousness resides in a given company varies as much as current definitions. This locus, moreover, is a function of a number of different factors including the size of a company, its age, business sector, competitive situation, culture, and vision. In the case of companies like IBM and P&G, the CEO is the central locus of innovation consciousness. In many other companies, the spark is generated at other levels, or grows out of a cross-division process.

In October 2006 The Conference Board conducted its biannual survey of the Business Council CEOs, including a special section on innovation.[2] When the Business Council CEOs were asked to provide their own definition of "innovation," a wide range emerged. Just over half of the respondents used the word "new" in describing how their company currently defines innovation. Yet for many of these respondents, "new" referred to incremental improvements to their existing products, processes, services, and technologies: "New ways of making current products better, faster, cheaper." A more scrutinizing review of the definitions reveals that only 1 in 4 respondents define innovation in such terms that require revolutionary, or breakthrough,

[2] The Business Council Survey of Chief Executives, in collaboration with The Conference Board, October 2006.

developments: "creating something not previously created." In addition to the focus of innovation on "new" the definitions provided by the Business Council CEOs also revealed a focus on the customer (or consumer). Nearly 40% of the definitions revealed that innovation was done with the consumer in mind: "…innovation… for the benefit of our customers…;" "…meet new consumer needs…;" "the creation of new technology, product, or processes that enhance customer value."

While the academic literature presents innovation as the key driver of macroeconomic success (or economic growth), business leaders too recognize the importance of innovation for both short- and long-term success. In the innovation section of the October 2006 Business Council CEO survey, 90% of the CEOs who responded said that long term growth and profitability was either the "most important" or "very important" goal of innovation (Figure 1). In addition, these CEOs also said innovation was either "most important" or "very important" to current growth and profitability, as well as market share, brand equity and developing new markets.

One explanation of why innovation has reached such a prominent position and is looked to as a solution in so many different areas of corporate endeavor -- e.g. growth, profitability, brand equity and new markets -- is the perfect storm of pressures facing US business: globalization, accelerating waves of new technology, and the growing power and expectations of consumers. Taken together, these factors point to three inescapable conclusions for large corporations:

- innovation is essential for survival,
- innovation needs to be pursued on a full-scale, continuous basis, and, ultimately,
- innovation is very granular.

Successful innovation may happen generally, but it doesn't happen "in general." Rather innovation in products, processes, and services are very specific in nature. It might also be noted that the innovation cuts such a wide swath across the corporation is that it has a holographic quality about it. Each element contains the whole as well the part, and vice versa.

Improving the Quality of Innovation Ideas

A central aspect of approaches to innovation can be summed up in the industrial metaphor of a pipeline. What is required is an "innovation pipeline," continuously in motion, in which ideas enter at one end and ROI positive products, processes, and services exit at the other. Brilliant as the original ideas may be, they cannot be considered successful innovation without a positive response from the marketplace. Indeed, in business terms, without generating revenues and growth, even carefully implemented ideas cannot be considered innovation at all. It is estimated that some 3,000 initially interesting ideas will narrow down to approximately 150 early proposals eventually resulting in one commercially viable innovation.

The old saying with regard to data manipulation -- "garbage in, garbage out" -- applies to innovation as well. Creative ideas are the raw material of innovation. Different companies pursue improving the quality of ideas in different ways. Cargill, for example, despite an innovation history stretching back to 1912, has recently set up a very defined process to create a 'pipeline', using the services of outside consultant, IDEO. Accenture Labs starts by seeking an adequate balance between two polar opposites: a) the development of standards-based solutions according to the established methodologies, and b) the characteristics of truly innovative technologies - including the facts that they are associated with high uncertainty in terms of

estimating developing times and costs and the lack of proved methodologies or standards for making this process a systematic and repeatable one. Similarly, to focus its innovation efforts and generate high quality ideas, P&G strives to find the intersection between "what is needed" and "what is possible." In the first dimension, P&G analyzes the preferences of end customers and intermediate users as well as the things being done by the competition; in the second, the feasibility of new technological innovations and the resources needed for its production are analyzed.

In September of 2005, at their meeting in Boston, members of The Conference Board's Council on Innovation decided to pursue its investigation of the theme of "innovating innovation," by focusing on four major themes, including taking costs out of the innovation process. Another way to understand the cost issues of innovation is to stand it on its head, i.e. to improve ROI, thereby creating a net reduction in 'cost per successful innovation.' As can be imagined, however, this is a complex metric at best. With the broad disparities defining innovation, it is not surprising that many of the measures of innovation listed in the Business Council CEO survey garnered significant support. While improvement in margins and top line revenue growth were identified by more than ¾ of the CEOs as the "most important" or "very important" measure of innovation, more than half the respondents also recognized change in market share, number of improvements to processes, ratio of innovation return to investment and change in product/service capacity (Figure 2). What is perhaps more revealing about this list, is that given a list of measures to choose from the Business Council CEOs were equally likely to choose financial measures as they were non-financial measures.

While business leaders may not yet have reached a consensus on what innovation is or how to measure it, the Business Council CEO survey has revealed that CEOs are recognizing more than just breakthrough developments as innovation. Those new business models, production processes, and other intangibles we have attempted to capture in the SOG model are being recognized as *innovation*. Moreover, these findings in the Business Council CEO survey are consistent with The Conference Board's 2003 survey on innovation,[3] and with the Boston Consulting Group's innovation surveys.[4]

Making Innovation Actionable – the Talent Solution

While business leaders recognize the importance of innovation, it is an entirely different challenge to "make innovation happen" within the workplace. In both the Business Council CEO survey and our CEO Challenge survey,[5] acquiring/developing the right talent was viewed as the number one organizational practice for improving innovation within the company. Yet firms are already beginning to recognize the limitations of the workforce – both the Business Council CEOs and the CEO Challenge respondents identified "lack of qualified management personnel" and "lack of qualified technical personnel" amongst the most important barriers to their company's innovation process.[6] The outlook from CEOs, however, remains positive, as less than 15% of respondents in each survey ranked either barrier as their most important

[3] See Troy, Kathryn L., *Making Innovation Work: From Strategy to Practice*, The Conference Board, 2004.
[4] Andrew, James P., *Innovation 2006*, Boston Consulting Group, 2006; Andrew, James P., *Measuring Innovation 2006*, Boston Consulting Group, 2006, and Andrew, James P., *Innovation 2005*, Boston Consulting Group, 2005.
[5] The Conference Board's 2007 CEO Challenge surveyed 769 global business leaders, of which 409 represented U.S. companies. The survey included a special section on innovation, which consisted of a subset of the innovation questions from the Business Council CEO survey.
[6] This result is consistent with the findings of The Conference Board's 2006 report, "Are They Really Ready to Work." Less than 20% of survey respondents rated recent college graduates as "excellent" on their math and science skills (ratings were either "deficient," "adequate," or "excellent").

concern.[7]

The Conference Board concluded from its 2003 survey that "targeting high potential employees for team assignments, giving successful team members a leadership role on a new team, and showcasing successful team members as role models are the practices most commonly used to support and motivate team members."[8] Moreover, there has been an increased emphasis on involving *more* employees in the innovation process, with executives recognizing that they need to "make innovation everyone's job." Among those who responded to the HR section of The Conference Board's 2003 survey, "60 percent have a formal process for gathering ideas from employees, with many saying that they are seeing growth in the number of ideas submitted and implemented, as well as financial payoffs from their implementation."[9]

The Conference Board's 2003 innovation survey also revealed that firms are turning to universities, government agencies, as well as current and potential customers for new ideas.[10] Respondents to The Conference Board survey report that "55 percent of their innovation is wholly created inside the company, while 10 percent currently outsource innovation operations."[11] These respondents expect their innovative activities to become increasingly involved with outside partners, resulting in fewer breakthroughs coming from solely inside the company. In Europe, 66% of firms that produced a product innovation developed their innovations internally, while 57% of firms that produced a process innovation developed their

[7] Responses to the barriers, in general, were positive. Very little support was found for any individual barrier, as most were ranked as either moderately or somewhat important by the Business Council CEOs.
[8] Troy, pp. 6
[9] Troy, pp. 5
[10] Troy, pp. 34
[11] Troy, pp. 20

innovations internally.[12]

Perhaps no company has more famously involved its entire 'community' in the process of innovation than IBM with its Global Innovation Outlook methodology -- thus superbly getting buy-in for moving projects along at the grass-roots level. Begun in 2004, GIO's third major event, the Innovation Jam of September, 2006, involved 140,000 IBM-ers, clients, business partners and family members who came together for a remarkable experiment in collaborative innovation: for three full days, people from 100 countries brainstormed online on how innovation can advance global issues. Phase I received 37,000 suggestions that were grouped and ranked in order to come up with 36 top ideas and a Phase II was executed in order to refine these ideas more.

Making Innovation Actionable – Corporate Culture

The corporate culture is important to innovation within the firm, as more than 3 out of every 4 Business Council CEOs identified visible commitment from top leaders, establishing/promoting an innovative culture, knowledge transfer among employees, and a corporate culture that accepts failed ideas as either most or very important organizational practices.[13] While it may be self serving for CEO's to choose visible commitment from top leaders as a key practice, taken together the overwhelming response to these organizational practices highlights that there is likely no "silver bullet" when it comes to organizing for innovation. Rather, innovation needs to be a part of the corporate culture, and requires a commitment from all levels of employees.

[12] *Innovation Europe - Results from the Third Community Innovation Survey (CIS3) for the EU, Iceland and Norway*, 2004, pp. 23.

[13] Like in the Business Council CEO survey, the CEO respondents in the CEO Challenge identified visible commitment from top leaders and establishing and promoting an innovation culture as most important.

Across The Conference Board's 2003 survey and the three surveys by the Boston Consulting Group, corporate culture was identified as a critical component to innovation success. The Conference Board reports that "innovative practices flourish best in a culture that allows the free flow of information and tolerates experimentation and risk." In addition, "the most successful companies say that organizational alignment is a minor problem for them, but 75 percent of the companies reporting low success rates see this as a major impediment."[14] This is consistent with the Boston Consulting Group's findings from their 2004 survey that almost 40 percent of respondents felt they were weak at "creating a corporate culture that fosters innovation."[15] However, more than half of the respondents "said they either were 'not sure' or plainly disagreed with the statement that their companies had the right organizational structures in place to foster innovation. In addition, just under half of the respondents either did not know or disagreed with the statement that their senior management team shared a common perspective on how to manage innovation and its success."[16]

The cost of innovation is also a function of the processes that form the basis of a companies business, as was the case with Dow Corning, historically an innovative company, that appeared to be stalled on a 15 year plateau. In the course of an analysis carried out at the behest of the Board of Directors, not only was the long and uncertain product development cycle highlighted as a problem, but important innovations in Dow manufacturing materials used by other companies to make products were not always recognized as such by those companies, or indeed within Dow itself. Respecting the complexity of innovation, and the importance of corporate

[14] Troy, pp. 4-5
[15] Andrew, *Innovation 2005*, pp. 12
[16] Andrew, *Innovation 2005*, pp. 18

culture in supporting or blocking the process, Dow decided reduce its risks by following a new business model -- creating a new internet based direct sales channel. To accomplish this, the company created a new brand, Xiameter, that could only sell silicon products using a "commodity" approach. This was radically different than the offerings sold through traditional Dow channels which sold bundles of product and service that had higher margins. The results of this strategy, that allowed Dow Corning to compete from two distinct positions simultaneously, were impressive: in less than 6 months, the company had been able to sell directly 450 products in 50 countries of the world by Internet without affecting its original brand, and this contributed to an increase in global sales from 2.5 B USD in 2001 to 3.9 B USD in 2005.

One of the aspects of innovation that is vexing is that it doesn't really happen in one area of a company; it has to be everywhere. Secondly it needs a powerful champion, such as the CEO in companies like IBM and P&G. Risk taking must be encouraged, and mistakes seen as learning opportunities. Attitudes like "the way we've always done it," "not invented here," and "we need to continue to improve our existing products," re-examined with a critical eye. Thinking outside the box, well-worn as that phrase has become, appears to be a touchstone. A company with a successful culture of innovation is one that has found a way to insulate its innovation initiatives from the short-term pressures go hand in hand with maintaining the 'legacy' business, and thus is carefully managing the 4 c's of innovation: customers, creativity, continuity and cash.

The Role of the Government

"In the February 2006 Business Council CEO survey, almost 70% of the survey responses said that fostering innovation was a very important government priority – ranking second only to the

importance of controlling healthcare costs as a policy issue."[17] When this issue was addressed in the October 2006 Business Council CEO Survey, CEOs identified IP protection, followed by math/science education, tort reform, and regulatory policy & efficiency as either a most or very important U.S. government policy for creating a favorable business environment for innovation (Figure 3). CEOs were less concerned with Government Technology programs, immigration, and public funding for R&D.[18] Yet when asked to evaluate the U.S. government's performance on these same issues, immigration policy followed by tort reform, math/science education, and regulatory policy and efficiency were identified as moderately or very ineffective. Only tax and IP protection were identified by more than 1 in 3 respondents as areas where government policies were effective.

It is striking that CEOs find math and science education to be one of the most important government policies for making the business environment more innovation friendly, yet believe the government has failed to deliver. This result, however, should come at no surprise. Average test scores in both science and mathematics have been relatively unchanged for over 30 years in the US (Figure 4). The federal government, meanwhile, has been focused on "promot[ing] educational excellence throughout the nation" since at least 1980, when the US Department of Education was established.[19] With a track record that suggests the federal government cannot be relied on to improve math and science education, taken together with the top practice for improving innovation – acquiring/developing the right talent –suggests a looming crisis for businesses in the US.

[17] The Business Council Survey of Chief Executives, October 2006.
[18] The CEO Challenge survey revealed similar rankings.
[19] US Department of Education website: http://www.ed.gov/about/landing.jhtml?src=gu

Some businesses been proactive in dealing with the potential talent shortage, instead of waiting for and hoping the US government can improve the skills of new labor market entrants. As part of their emphasis on education, including an emphasis on college degrees for management positions, Home Depot's training program includes several offerings that are eligible for ACE (American Council of Education) credit recommendations. In addition, Home Depot has formed strategic alliances with online universities.[20] These training offerings then not only provide the employee with the training they need, but move them closer to obtaining the credentials to help them advance further.

Other companies, particularly those in high tech industries, have turned outside the US to find talent. Of particular interest for these companies is the H1-B visa, which is given to foreign workers in high skill specialty occupations. This resource is limited, however, as federal law mandates the US Citizenship and Immigration Services cap the number of H1-B visas awarded (for 2008 the cap is set at 65,000, with room for up to 20,000 "exceptions").[21] Moreover, this cap is binding, as the USCIS received over 150,000 petitions within the first day they were accepted. The limited availability, coupled with the focus on high skilled specialty occupations, likely explains the both the low importance and low approval CEOs report for the impact of the federal government's immigration policies on innovation (Figure 3).

Innovation Success

Despite the growing attention and commitment to innovation, few executives speak highly of their company's success. In The Conference Board's 2003 survey, "56 percent of respondents

[20] Brian Summerfield, "The Home Depot's Leslie Joyce: Laying the Foundation for an Effective Workforce," *Chief Learning Officer*, January 2007.
[21] USCIS press release, April 3, 2007.

say they are only 'moderately' successful."[22] Similarly, the Boston Consulting Group has found that just over half of those surveyed in 2003 were not satisfied with "the overall financial return on innovation spending."[23] Executives surveyed in 2004 and 2005 were slightly more successful, but nearly half remained unsatisfied with their financial returns.[24] Confidence in their ability to turn innovative ideas into profits declined from 2004 to 2005; 40 percent of the executives "said their company was not as good as its competitors at turning ideas into profits" in the 2004 survey, but 48 percent did not compare themselves favorably to competitors in the 2005 survey.

For consumer companies, and many corporations who provide business-to-business products and services, successful innovation starts from an understanding the needs, wishes and even dreams of consumers. This should not be confused with traditional 'market research,' whose primary benefit is understanding how to improve established products. As Apple CEO, Steve Jobs has noted, 'customers can't want what they can't imagine.' Companies who want to innovate successfully must focus on addressing "unmet needs." To do this, they must understand at a basic, gut level customer interests, fears and desires; and then being willing to take imaginative leaps to create new products and services that respond to these interests and desires, even when they are only partially understood by consumers themselves. VISA, for example, in its quest to find ways to use credit cards for micro-payments, moved forward based in part on very detailed observation of small payment processes in specific real-world situations in which they were initially unaware toward what eventual innovation these behaviors might point.

[22] Troy, pp. 6
[23] Andrew, *Innovation 2004*
[24] Andrew, *Innovation 2005*, pp. 7, and Andrew, *Innovation 2006*, pp. 7

Innovation can also occur solely within the company, having no direct impact on the appearance or uses of the product. For companies whose product requires enormous capital investment, such as oil companies, an incremental improvement in a basic process can provide breakthrough levels of efficiency and cost-saving. A new catalyst for refining gasoline or a harder drill head for deep-well off-shore oil and gas exploration can result in significant competitive advantage even though the product as purchased by the ultimate customer will remain relatively unchanged. In these cases, innovation is a multi-year process that requires careful, regular, and rigorous "gaiting" by a senior executive whose go, or no-go decisions are critical as the developing project moves through the 'gates' and expenses run into the millions of dollars.

Figure 1: For your firm, how important is innovation to:

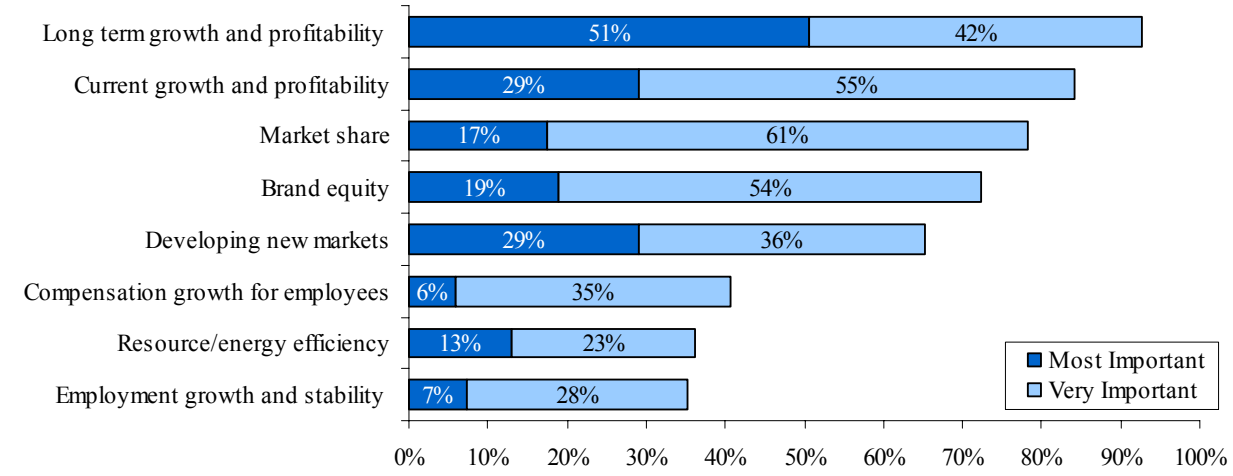


Figure 2: How important are the following measures of innovation?

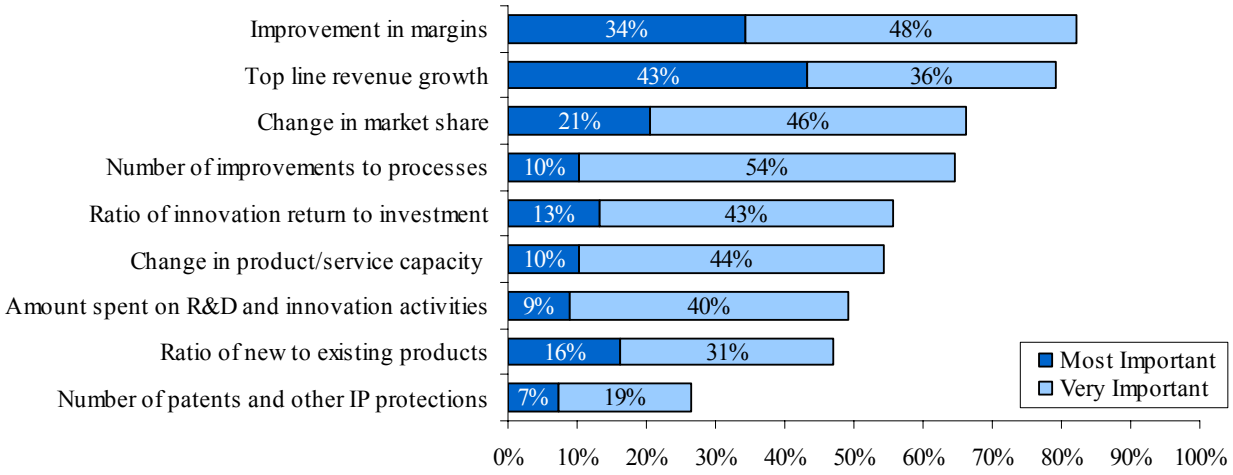


Figure 3: Role of Government Policies in Creating an Innovative Business Environment

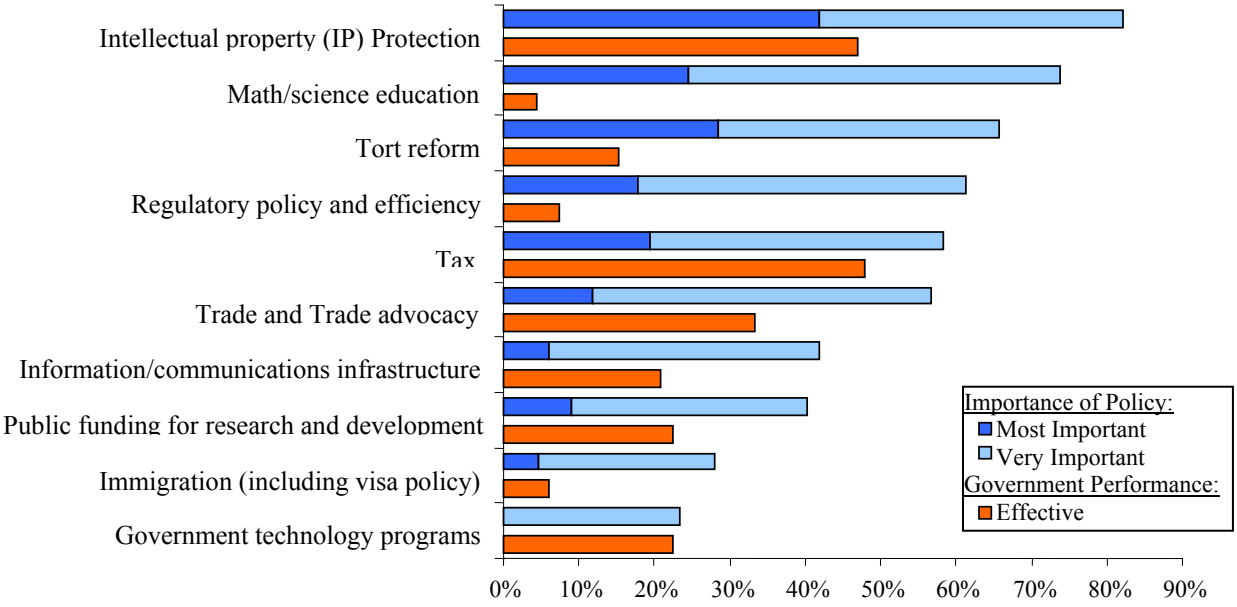
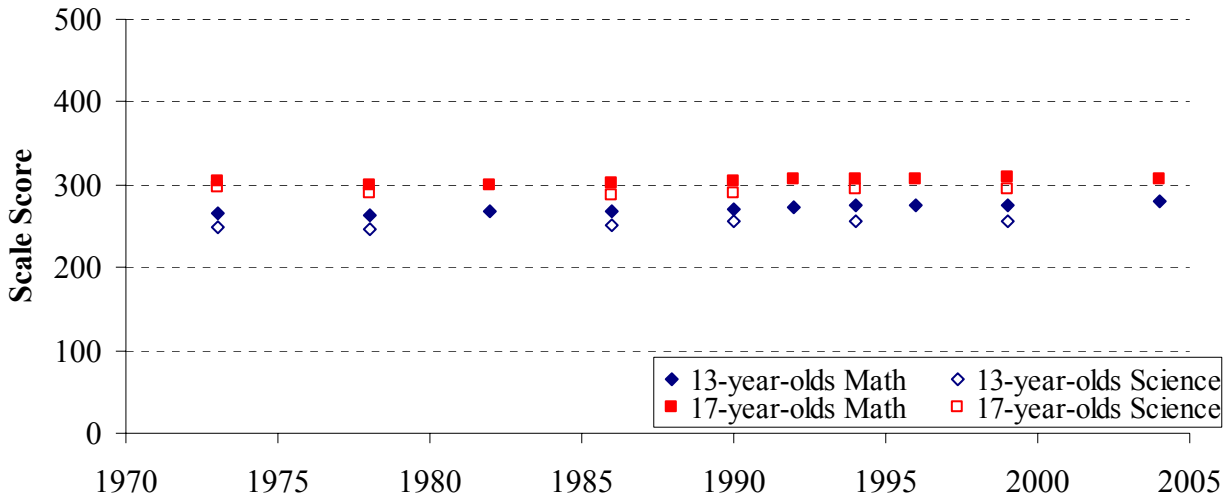


Figure 4: NAEP Math and Science Scores



source: Math scores: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), NAEP 2004 Trends in Academic Progress; and unpublished tabulations, NAEP Data Explorer (http://nces.ed.gov/nationsreportcard/nde/); Science scores: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1999 Trends in Academic Progress: Three Decades of Student Performance, 2000, Table 16.