Dear Conference Board member:

As the velocity of public communications continues to increase exponentially, and conclusions are packaged in shorter and shorter formats, it has become more difficult for business leaders to participate thoughtfully in the public dialog. (A simple illustration is the preceding sentence, which would not fit into a tweet.) In this environment, CEOs of the largest companies have become more cautious with many preferring to stay out of the limelight while an increasingly fractured and loud “debate” takes place in public.

But that doesn’t mean our business leaders have stopped participating in important discussions that take place at the intersection of business and society – they just do so in different forums. At The Conference Board, we’re fortunate to feature each year in our Annual Report deep and insightful essays from the world’s leading CEOs, academic and business leaders. They write about the issues that keep them awake at night – from the effects of inequality to the challenges of improving education, from a discussion of trust in business to best practices in sustainability, from the importance of manufacturing to the importance of the Euro.

The topics vary widely in this compendium of short essays from 1999 to the present day, but what binds them together is the balanced perspective that each shares. Informed by their leadership of the largest organizations in the world, or in some cases through years of academic research and study, these business leaders share their perspectives, and more than that they share their aspirations for what we can all accomplish. In this they are aligned with The Conference Board’s mission: to help our members improve their performance and better serve society.

Jonathan Spector
Chief Executive Officer
The Conference Board, Inc.
OUR MISSION IS UNIQUE

To provide the world’s leading organizations with the practical knowledge they need to improve their performance and better serve society.
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Harvard Professor of Economics
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Jim Collins
Author of Good to Great
The Misguided Mix-up of Celebrity and Leadership

2000
Paul A. Volcker, Former Federal Reserve Chairman
The Exchange Rate System Needs a New Look

1999
Peter F. Drucker
Author and Professor, Claremont Graduate School
The Real Meaning of the Merger Boom
Increasing disparities in income and wealth may threaten the sustainability of capitalism. We as business leaders need to champion ways to improve equality of opportunity and help ease the hostility of the public debate, or we risk losing support for America’s unique form of free market enterprise.

There’s no getting around it: some inequality is integral to all economic systems. Individuals differ in their abilities and endowments. Investors and innovators who take risks, bring successful ideas to fruition, and create jobs for others are and should be rewarded. Over the long run, free market capitalism has fueled prosperity and growth in living standards, and it is the only known pathway to enduring growth.

But capitalism can be maintained only if its benefits are widely shared. Its rewards should accrue to the broader constituencies of customers, employees, and communities in addition to owners. Today, that accrual isn’t happening broadly enough. Inequality has escalated to levels at or near those of the 1930s, which were the highest on record.

Some of the increased inequality we’ve seen over the past few decades is the result of highly successful innovations and investments that have yielded high returns for a small number of innovators and investors. However, some of today’s inequality comes from lagging income growth for working Americans. Many individuals and households have not recovered fully from the financial crisis of 2008. And too many Americans today believe they have no realistic chance of success. Disappointed by their own economic circumstances and fearing diminished prospects for their children, some Americans question the free market system and fear that it has been manipulated to their disadvantage. Lagging income growth causes concern and raises questions about the fairness and, in some quarters, even the desirability of our capitalist system.

How do we best address this concern? Certainly not by trying to enforce equality of outcomes; economic systems that have tried to do this have failed. They not only failed to deliver widespread prosperity but also generated their own inequality and waste through economic manipulation and corruption. It is generally understood that trying to create equal outcomes by significantly curtailing returns for successful investments and risk of capital won’t work either; it could lead to a scenario in which investors in today’s open, global economy pursue their ideas and create jobs outside the United States. It could also have a chilling effect on innovation.

Rather, our society’s primary objective should be equality of opportunity that
reduces inequality of outcomes. The economy must lift the bottom, not compress the top. Until we achieve equality of opportunity, we must provide a safety net to ease the current inequality of outcomes that often creates inequality of opportunity, which is then carried on into succeeding generations. We must provide an exit path from this cycle.

We should measure our success by the extent to which Americans can support themselves through their own work or entrepreneurship. While income assistance programs may be a permanent necessity, income derived from individual labor, investments, or savings represents production, self-sufficiency, and security in a way that income derived from dependency on other sources does not. We should strive to move people from dependency to self-sufficiency.

Business can and should take a leadership role in easing the hostility in the inequality debate. It is in the best interests of businesses to provide rewarding employment. Loyalty and a strong sense of shared purpose yield the best business results. Short-term savings at the expense of workers might bring a temporary uptick in profits, but it won’t bring long-term sustainable performance. Executive compensation systems should be geared to reward senior management for creating long-term and sustainable business outcomes, with a lessened focus on “short-termism.”

At the same time, failing to respond to globalization does not save domestic jobs, but rather puts all of a US firm’s jobs in jeopardy. The “social contract” should be refreshed to restore a broad consensus about the value of our free enterprise system; this contract should reconcile the concurrent needs to compete in global markets and grow at home.

As we see it, the path forward is to encourage public policies that equalize opportunity. Four policy measures in particular seem paramount: (1) improve public education to equalize future opportunity, (2) reform the health care system, (3) reform the tax system; and (4) seek balanced regulation.

Improving educational outcomes is the surest path to equalizing opportunity, increasing productivity growth, and raising incomes. As a nation, we should expand access to quality early childhood learning, especially for at-risk children. We need increased quality-focused accreditation, qualified teachers, performance measurement, and accountability for results. Availability of care and education will facilitate work for low-wage parents, thus easing inequality. Enhancing K-12 performance through high educational standards will ready students for college and their careers, as will broadening postsecondary access, especially for students from low- and middle-income families and for older “unconventional students” who have not completed degrees but have begun careers. Less expensive, competency-based alternatives to the traditional “seat-time” approach to awarding college degrees, certifications, etc. will also broaden opportunities.

As these educational opportunities increasingly offer opportunities for productive labor, we must be sure that labor is sufficiently compensated. Currently many states and localities are debating the desirability of raising the minimum wage. It is important to recognize a major lesson of economics: wages must at least approximate worker productivity in order to be sustainable. Businesses and workers together need to leverage opportunities to make all workers more productive. Increased productivity is the bedrock for both increasing compensation and increasing societal well-being overall.

As a society, we must continue to reform the health care system. Health care costs have been increasing at a rate faster than overall inflation. Having a large and rapidly growing proportion of national wealth dedicated to health care expenses risks crowding out other productive investments that businesses and society overall might wish to make. We need to inject competition into the health care system to raise quality and lower costs.

We need a constructive public dialogue to reform our current tax system. Tax reform that eliminates special tax breaks and encourages savings and investment should enhance economic growth and opportunity and cover the cost of operating government.

Another prime challenge is regulatory overload. At the federal, state, and local levels, many US firms, both small and
large, are subject to regulation. We understand that a well-ordered free-market system requires prudent regulation.

The challenge is to create regulations that foster innovation while protecting the interests of society at large, which include fair competition, health, and safety. New regulations should be allowed to move forward if overall benefits outweigh costs. Existing regulations should be reviewed on a regular basis to ensure their continued value and relevance. Avoiding the extremes of unfettered competition and stifling regulation should allow our society to achieve growth while maintaining the trust of our citizenry.

Without true opportunity, the ills of inequality, low productivity growth, and economic stagnation remain—leading to cynicism and despair. The society that is left is unsatisfying even to those who succeed. Success itself is in jeopardy as the workforce atrophies, the markets for products and services slowly migrate elsewhere, and society begins to question the viability of capitalism itself.

Current economic and political conditions could risk leading the United States to adopt extreme and ill-considered public policies. The stakes are high. We advocate economic growth through equalizing opportunity by equipping people with the tools they need to achieve success now rather than attempting to equalize outcomes after the fact.

Equalizing opportunity and building a more dynamic, productive, and vibrant economy will raise every member of our society. The public debate over inequality should pull our nation together, not tear it apart. We call on business leaders and all Americans to unite in this challenge of seeking equality of opportunity and prosperity for all.
Let’s face it. Too many Americans have lost faith in the business community. The reasons are many, but there is little doubt that trust in business, at least “big business,” and in the people leading it, is too low—and this is not just an American phenomenon.

I should acknowledge up front that some of the criticism is well deserved and the damage to the reputation of business in general has often been self-inflicted. Some of our behaviors have made it appear like we are playing by our own rules and oblivious to the realities most people face. And when CEOs behave with a sense of entitlement rather than a sense of humility and an acknowledgement of the responsibility that comes with their title, trust is one of the first casualties.

At a time when wage inequality and lack of economic mobility persist in many countries around the world, too many people believe that the deck is stacked against them; that corporations hold all the cards. In this context, it is no surprise that trust in business is low and that we have lost our voice in articulating the positive role we play in society.

This can change. But we must recognize that trust is earned, not claimed.

Make no mistake: public corporations have a responsibility to create value for shareholders. But profit and robust growth can—and must—coexist with good corporate governance, principled stewardship, and a strong commitment to the communities in which businesses operate.

Large companies can play a role that transcends fiduciary responsibility and, frankly, heightens value creation. Our people and our technologies improve the productivity of the economy and positively alter the way we live our lives. Indeed, many of the small businesses that are such an important growth driver of our economy often result from the talent we develop and the demand we create. Large companies contribute much of the resources and human capital that strengthen communities across the globe. We do not merely have offices in these communities; we have homes and we raise families.

At Cardinal Health, we try to demonstrate our commitment to the communities in which we operate. We take pride in the work we do to address the many big issues of the day—access to healthy food and safe housing, funding to study disease and improve care, prevention of prescription drug abuse and misuse, and the advancement of the arts and education.

We commit not just in words, but in actions. As a company, we champion and fund many activities that enrich our communities. Our employees mentor youth throughout the year, working hand in hand with them to help them discover opportu-
nities and improve their self-confidence. We support heroic veterans returning home from military action as they transition back to the civilian workplace.

We are not alone. This is happening in companies everywhere. And yes, these activities are sponsored and mobilized by outstanding CEOs who are deeply committed to their companies’ performance and making an impact in their communities.

Yet, many of us in business seem to have lost our voice. The reasons are not hard to understand: sensitivity to mistakes we must own, charges of hypocrisy, questions from shareholders about the use of corporate resources, and the fear of criticism.

I would like to see the business community regain its voice and embrace its broader role in public life. Let me give a brief example of how business can serve society and why nothing is more important than trust.

Cardinal Health is headquartered in Dublin, Ohio, a few miles outside of Columbus. The city of Columbus is experiencing a tremendous renaissance. It is home to the state government, The Ohio State University, and many other terrific academic institutions nearby. Columbus is also home to highly ranked hospitals and health systems, and a number of large corporations. There are lots of reasons why we are proud to call Columbus home—from its diversity, to its vibrant arts community, to its collaborative civic engagement.

And the city has benefited from the leadership of a Democratic mayor and a Republican governor who rise above their philosophical differences in order to prioritize serving constituents over partisanship. That said, like many other metropolitan school districts, Columbus is experiencing a crisis in its public school system.

The Columbus business community could have chosen from a hundred reasons why we should stay clear of education reform: the complexity of the problem; the absence of a “silver bullet” solution; the potential for ugly, divisive politics; the distraction from day-to-day business; and the question of whether people would trust business involvement.

But instead of being overwhelmed by the problem, we chose to overcome the obstacles. We partnered with the mayor and the city council president, who share our view that the kids and our community deserve better. We asked them what we could do to effect real and lasting change. They challenged us to fully commit and collaborate with others in the community with a simple goal: assuring every child in Columbus has the opportunity and skills to succeed in life.

I was excited to serve as a co-chair of the Columbus Education Commission convened by the mayor and city council president. This 25-person commission on education reform included business leaders, union representatives, parents, community and nonprofit leaders, university presidents, and faith-based leaders. Our backgrounds are diverse and our perspectives differ, but we all committed to that simple goal. Why? Because we know that if we give all children a quality education that prepares them for success, in all families, businesses and communities in Columbus will benefit—and because we understand the consequences of failure.

There were those in our city who worried that business involvement would mean a “corporate takeover” of the education system. Frankly, opinions like this frustrate me. But I recognize they are a response to the loss of trust businesses have suffered.

The Columbus business community has worked hard at increasing transparency, promoting inclusiveness, explaining our involvement, and trying to break down those walls that undermine trust. Our commitment is clear and unwavering. While it is much too early to say what kind of impact we will have on public education, we are “all in” on this issue.

And so, I do bristle at the notion that business plays only a self-serving role. It is simply not true. However, it is clear that we must not shy away from asserting our role in society and our commitment to making the communities around us more productive and creative, healthier, and safer. We can demonstrate through our actions and thoughtful engagement that we are dedicated to improving the places where we live, work, and play anywhere in the world. Instead of accepting an increasingly lower profile, business can focus on building trust. With renewed confidence, business can regain its broader role in society. And in the process, we will find our voice.
I was asked to join RBS as CEO in November 2008 to lead a new team to recover the bank for all who rely on us. The bank had become a British poster child for the things that had gone wrong in banking. With a balance sheet equivalent in size to the UK economy, resting on only the thinnest capital base, it was an institution that had to be bailed out by national taxpayers.

The resultant change has been truly radical, restructuring the £1.6 trillion balance sheet, adjusting the risk profile, refocusing on our customers, and navigating a safe path through a myriad of economic uncertainties.

Our enduring job is to create in RBS a really good company, one that is both safe and sound and one that puts serving customers well at the heart of its thinking. Achieving this means tackling the aspects of our culture that had contributed to our failings, but doing so in a way that nurtures our strengths.

The challenges at RBS are a parallel of the challenges facing the banking industry more widely. It’s possible to look at the scandals that have hit banking in recent years and see them as individual episodes of poor judgment or bad behaviors. In fact, I think it’s more accurate to say that most of them are related to one big problem: banks failing to put their customers first, enough of the time.

In recent times banking lost sight of the customer-compass that successfully guides the best companies across many industries. Banks eroded the founding principle of trust upon which the industry rests; losing the trust of customers, the trust of
the public, regulators, and behind closed doors, losing the trust of our people. In any arena, trust is hard won and easily lost. The starting point for the industry to recover this is simple; we need banks to be direct and open in dealing with the mistakes of the past and accepting of the consequences.

I am very clear that for RBS winning back its reputation will be a slow steady march through numerous changes and improvements; doing the right thing, at the right time for the right reason. Part of this is about strengthening our culture, but there is something oblique about enduring culture change: like the desire to obtain a high share price, it’s rarely best achieved when it’s the primary goal. For me the process starts and finishes with a focus on customers.

Over the course of my career I’ve been fortunate enough to have spent time seeing really good companies across a range of different industries. Regardless of industry or geography, great companies share many of the same hallmarks. Companies that have distinguished themselves consistently over time in mature markets such as banking have rarely done so on the back of brilliant inventions or flashes of genius. But they have demonstrated that they execute the basics of their business really, really well. These companies get their strategy right, communicate it with absolute clarity, and then implement it consistently at all levels of the firm. They also have a very clear set of values that guide how they do business.

This approach applies to even the most diversified businesses. It’s about pulling ahead and staying ahead through a thousand little things done a little bit better each time. In established industries, success is the accumulation of many marginal gains that are geared towards a single overarching goal or focus. For banks, that focus once again needs to be our customers.

Parts of the banking industry sought greater excitement and thought that some of these business fundamentals didn’t apply. In reality banking needs to listen and learn more from other industries, especially those that have successfully embedded an overwhelming customer ethos that runs uninterrupted from the boardroom to the shop floor.

I have never seen a consistently successful company in any industry, anywhere in the world that didn’t do a better than average job in serving customers. In fact, the most successful companies I’ve seen are almost obsessive about customers because they know that all other success flows from this. When I speak to our most successful corporate customers I almost always see a consistent human expression of their organizational values. I don’t mean that everyone looks the same or talks the same—complex and global companies don’t have a narrow homogenous culture—but there is a common characteristic in their people, the way they talk about customers and how they go about their business that impresses you.

The challenge of instilling company-wide values in the same way that other large successful firms do is sometimes more difficult because many of the world’s largest banks were formed through mergers, acquisition and in some cases, forced marriages. But it is essential for success.

Banks have a tendency to compare themselves to each other in an attempt to benchmark their own success. In the wake of the financial crisis and the historic scandals that are now coming to light, banks need to look beyond our own narrow industry to understand what it will take for them to become great companies.
For much of the 20th century, America’s economy was defined by what it manufactured. After World War I, our manufacturing sector made us an economic leader among nations. We made products at home, sold many of them abroad, and built our economy—and our middle class—with the wealth it generated. By 1930, mass production had become known, in the parlance of the day, as “the Great American Art.”

But increasingly, the art of manufacturing is no longer a “Great American” one. The manufacturing sector that once defined our economic strength has withered in the United States, even as it has risen overseas. In the last decade alone, the United States has shuttered more than 40,000 factories and watched 5.5 million jobs disappear from its shores.

This change is largely the product of globalization. Capital, goods, services, and ideas move more swiftly and more freely across borders than ever before. Companies, once anchored to their country of origin, can now build and invest almost anywhere in the world. It is no surprise that they are drawn to dynamic economies like China’s and Brazil’s. These countries are attractive to businesses not only because the markets are large and growing larger, but because the governments in those nations are active partners in expanding the manufacturing sector. They are helping businesses raise capital for new plants, educating future engineers and scientists, and creating a climate where manufacturers can thrive.

Meanwhile, in the United States, we operate as if little has changed. It is as if we assume that because of our greatness, companies will continue to invest here, just as they always have. We are wrong. Not about America’s greatness, but about what it entitles us to.

It is time to recognize that if we do not act soon, we will become the global economy’s biggest bystander. We have a choice: we can watch our economy continue to erode or we can commit ourselves to reinventing our manufacturing sector, thereby creating even greater growth and prosperity than we have in the past. We can build the cutting-edge products that other countries will buy: the things that allow people to grow healthier food, drink cleaner water, consume less energy, and travel faster and farther than ever before. We can make the products that will change the world.

This is not just a matter of national pride. It is a matter of necessity. Of all the sectors in our economy, only manufacturing has the capacity to create jobs on the scale we require. One job created inside a manufacturing plant creates three to five jobs outside it, up and down an extensive

Andrew N. Liveris
President, Chairman, and Chief Executive Officer of The Dow Chemical Company
supply chain. In a sluggish economy, one that requires us to create 125,000 jobs every month just to keep up with population growth and a total of 14 million new jobs to achieve full recovery, manufacturing is our only answer.

Manufacturing is vital to our future for another big reason: where manufacturing goes, innovation inevitably follows. Think about it from the perspective of a team of engineers trying to work out the kinks in producing a new prototype. Working them out in a factory across the street is incomparably more efficient than trying to resolve them remotely in a factory across an ocean. Products tend to evolve where they are made. So by ceding production of current-generation technology overseas, we cede the production—and development—of the next generation of innovation as well. Over time, if America stops making things, we won’t be inventing many things, either.

But this does not have to be our fate. We can reinvigorate our manufacturing base, but it will not happen by default. It will take determination and smart, concerted action. The United States needs a comprehensive, national economic strategy—one that recognizes that our economic challenges do not exist in silos and that ad hoc, piecemeal solutions will not work. Specifically, we need to make long-term investments in America’s economic capacity—from updating our roads, rails, and ports to reforming our education system. We need to foster a business-friendly environment by streamlining regulations, reducing corporate tax rates, and dismantling trade barriers that hold back our export industries.

And most importantly, we need partnership—genuine partnership—between business and government. We must recognize that we are all in this together for the simple reason that none of us can do it alone.

I was born and raised in Australia. But many of things in my world—my toys, my tools, my machines—were made in America. I joined an American company more than thirty years ago in part because I believed the United States was the most innovative, most productive nation in the world, the maker of the planet’s best things and the generator of its most creative ideas. I believe America can be that nation again.
The German chancellor, Angela Merkel, recently stated: “If the euro fails, Europe fails.” These are wise words. Indeed, the euro sovereign debt crisis is no longer an issue for just a few “peripheral” European countries; it has spread to include all members of the European Monetary Union (EMU). Many respected economists have actually said that the very survival of the euro is in question.

The crisis has shown that the EMU has suffered serious design flaws since its conception in 1991 at Maastricht, shortly after the fall of the Berlin Wall. Measures for the coordination of fiscal policies were particularly poor. We all knew that. In fact, they became even weaker after Germany and France were not sanctioned when they failed to meet their own fiscal targets from 2003–2004. On top of that, financial regulation—and especially supervision—was still largely national, lacking a single euro-wide perspective. Mechanisms for preventing and resolving cross-border crises were deficient or simply nonexistent.

The global financial crisis of 2008 highlighted all these shortcomings. After the first Greek crisis in early 2010, European authorities did indeed react, as shown in the profusion of communiqués and documents. Alas, hardly anyone can claim that they were ahead of the curve. At this juncture, we urgently need to find a comprehensive solution that puts an end to the euro zone problems once and for all.

As a banker, let me stress two basic principles that need to be part of this solution. First, the sovereign debt of solvent countries should remain genuinely “risk-free.” Second, all sound and viable financial institutions should have access to funding at reasonable rates. These two principles are important, but at this stage the more critical one concerns sovereign debt. Until the situation in debt markets is stabilized, normality will not return to the financial markets.

We need to look well beyond the confusion that we have witnessed in recent months. We cannot envision how the EMU will look in the final analysis from current markets. And yet, clarity is of the essence nowadays. The last EU Summit in December 2011 was positive in this regard. The German government—and some others—have called for a genuine “fiscal union.” They have been consistently worried about moral hazard. They fear that a rushed and misguided solution to the euro zone crisis may generate perverse incentives for countries with weaker fiscal discipline. They also fear the inflationary impact of injecting too much liquidity into the system. I fully share those concerns. They are rightly part of the European response to the crisis.
We have to look confidently at the decisions that guarantee adequate funding for all solvent banks. In technical terms, that means that the European Central Bank (ECB) should lend at longer maturities without undue restrictions and with a wide range of assets accepted as collateral. Such mechanisms would facilitate the smooth absorption of sovereign debt by the banks. Also, the ECB itself should not hesitate to keep up regular and sizable purchases of public debt until the normal functioning of the markets fully recovers.

Finally, we have to take into account that the mood in Europe has changed over the past couple of months. European politics have changed. Now, all European governments fully grasp the gravity of the problems. They are finally committed to implementing painful and unpopular measures. In particular, in the elections in Spain last November, voters gave a clear mandate for reform. The banking landscape is changing too. We are seeing a profound restructuring, in parallel with significant deleveraging and strengthened capital ratios across the euro zone.

However, we still have a lot of work to do. Looking forward, we need to know how the Greek debt write-down will be managed, how much ammunition will be given to the European Financial Stability Facility (EFSF) or its successor, the European Stability Mechanism (ESM), and what role will be given to the so-called euro bonds. All these are important questions for the future of the EMU. In parallel, as recently agreed, we should implement stricter fiscal rules, increase the capability for monitoring the budget processes of member countries and, if necessary, imposing credible sanctions.

At the end of the day, a lasting solution to the euro’s problems can only be reached through further European integration. More Europe is needed, not less. It is time for vision. The popular mandate for reform is clear. If we are able to achieve these reforms, 2012 will indeed prove to be a new beginning for the euro.
The social responsibility of companies—and banks in particular—has become a central issue in the public debate about the factors at work in the financial and economic crisis. All over the world, charges of a lack of ethics have been leveled against companies and managers, and especially against banks and bankers. As a result, the standing of the market economy as a whole has suffered.

This is an alarming development. Companies do not operate in a vacuum, and they cannot flourish in a parallel universe. Banks in particular require people’s trust and acceptance, which means they need to truly serve people and not only the so-called “real economy.”

Deutsche Bank’s motto is “Passion to Perform,” and we consider our social responsibilities an element of performance and an integral part of our work. As a global investment bank, we feel it is in our own best interest to live up to these responsibilities. After all, the more stable the societies in which we operate, the better our chances of success. Thus, we view corporate social responsibility as being of mutual benefit to our business and society as a whole.

Our topmost social responsibilities are to be internationally competitive, earn commensurate profits, and grow as a company. For only if we are strong can we be a good partner for our business and private clients and retain and/or create jobs.

Our second corporate citizenship priority is to earn money in a manner that is both socially and ecologically responsible. The social impact of our activities is a top concern. Companies and managers, especially those in the financial sector, cannot operate without trust, and sustainable economic success is not conceivable without it.

Above all else, trust is based on credibility. No amount of profit can serve as an excuse to risk the credibility and reputation of the bank. Therefore, corporate social responsibility must be integrated into our strategy and processes and duly considered in all decisions.

**Striking a Balance between Shareholders and Stakeholders**

Companies, especially stock corporations and their leadership, have always faced the task of achieving sustainable profitability while reconciling the different interests of shareholders, customers, employees, and the public. While shareholders take precedence in a capitalist system, finding the right balance between all stakeholder groups is essential.

This balancing act has become more difficult as a result of globalization and the growth of increasingly diverse societies.
To remain successful, companies such as Deutsche Bank, which operates in more than 70 countries around the globe, have to transform themselves into truly multinational firms. In addition to being a good corporate citizen in all of the societies it operates in, a global company has to develop a specific multinational identity that offers a commercially attractive corporate character and appeals to employees worldwide.

Conveying such a multinational corporate identity to the outside world and to local communities is not always a straightforward matter. Understandably, customers, investors, politicians, and members of society bring locally influenced views and expectations to discussions with global companies, and these frameworks are inevitably influenced by national perspectives and local values.

To successfully balance competing interests, companies must carefully listen to all stakeholders. This not only helps organizations gain a better understanding of the different motives and interests at play. It also helps companies avoid reputational damage that could result from not being sufficiently aware of the interests of some stakeholder groups. Moreover, companies that take stakeholders' views into account are able to present their own views more convincingly.

Meeting the Challenge of Conflicting Interests

A deeper understanding of different viewpoints can also help companies resolve disagreements. The responsible approach to such conflicts is not to gloss over them, but to lay them open, present one's own position and its rationale, and communicate this position consistently to all audiences. This last point is particularly important. It may be tempting and less stressful to tune messages to different audiences, but such a policy will ultimately undermine credibility over time and damage the reputation of a company and its leadership.

Credibility is earned by speaking one's mind and then putting words into action. Companies must have the corporate ethic and the courage to communicate the uncomfortable truth that there are conflicting interests in this increasingly complex world and that finding solutions involves taking all of these opinions into account.

Not surprisingly, the recent crisis has not improved conditions for dialogue. If the financial industry and banks want to regain the confidence of their clients and society at large, they must be honest about the shortcomings and deficiencies that were revealed by the crisis. They must be transparent about the measures taken to rectify these failings and participate actively in discussions with lawmakers, regulators, and the general public on reform measures, while, at the same time, safeguarding their legitimate commercial interests.

It is not just in the banking industry's own interest to succeed in this endeavor. The world needs a dynamic industrial sector with respected financial institutions that are accepted by the societies in which they operate. This is the only way business can achieve its full potential to generate prosperity.
As a diversified business group in an emerging nation like the Philippines, which faces its fair share of socioeconomic challenges, the Ayala group of companies has regularly had to reflect on and realign its objectives to meet the needs of its social and physical environment. Alongside our efforts to realize a fair return on the risk capital we put to use, we have always sought to help address the development challenges of our nation. We do not see these goals as mutually exclusive. In fact, we see their coexistence as highly relevant to our long-term success.

Mounting scientific evidence on the speed and dire consequences of climate change and the persistent inability of many of our Philippine communities to climb out of poverty have led us to conclude that leaders in the business sector—together with other stakeholders in government and civil society—need to be more effectively engaged in helping respond to these issues. Ideas from all three sectors will be needed to achieve an acceptable growth trajectory for our economy.

Ayala has decided to be more rigorous in incorporating powerful and innovative sustainability principles into its business models and operating practices. It is our intention to have a more substantial and effective net impact on the environment around us and the development of the communities in which we operate. We recognize that the current economic environment makes it hard to achieve even a good single bottom line, much less realize a good triple bottom line. I am convinced, however, that if we address environmental and developmental issues with the same rigor and energy that we approach traditional business opportunities, we will remain relevant to the communities we serve and build the trust of our customers in new and unexpected ways. To succeed in this mission, companies will need innovative solutions, better operating practices, and a decision-making mindset that takes a more inclusive approach to growth.

Many of our companies are finding it is possible to simultaneously achieve our business goals and our economic, environmental, and social objectives.

Manila Water Co. Through its Tubig Para Sa Barangay project, our water distribution company has found imaginative and cost-effective ways of delivering safe water and sanitation services to an increasing number of low-income residents within its concession zone. By serving these residents in new and innovative ways, Manila Water has more than doubled its billed water volume and dramatically reduced system losses.
**Ayala Land** Our real estate company has incorporated green innovations into its recent developments, including NUVALI, a new city established south of Makati that encompasses 1,700 hectares. From its master planning to the methodologies and operations used in its construction, NUVALI has been designed to significantly lower the carbon footprint of its resident communities by emphasizing water conservation and encouraging foot traffic and cycling, energy efficiency, and recycling.

**Bank of the Philippine Islands and Globe Telecom** These two groups have joined forces to form the country’s first mobile microfinance bank, which combines the bank’s strength in financial services and the technology of mobile value transfers to lower costs significantly for previously underserved groups who had not traditionally had access to financing. While still in its early days, we see this program as representative of the potential of new technologies and operating models to empower low-income communities.

These experiences have shown us that sustainability in business is not just about doing the right thing for future generations, but also about projects that make business sense. Our new initiatives have had significantly positive repercussions on customer preference, employee engagement, community trust, and profitability.

Businesses must envision a future where sustainability is integrated into every aspect of their business operations. We have therefore sought to incorporate globally accepted measurements to track our progress on these initiatives and give the measures as much importance as the usual metrics we employ to determine the financial health of our operations.

Finally, for a business institution to meet these new challenges effectively, we feel that it is increasingly important to develop dynamic partnerships with new groups and institutions. Sustainability goals are hard to reach without broad multisectoral participation from other interested parties, and we have had to redefine our traditional models for partnerships.

Long-term success for any business undertaking can only come from building the long-term trust of the larger communities that are served by its products and services. Now more than ever, businesses have to honor the implicit social contract they have with the societies they serve, and we have no choice but to help resolve the challenges of our respective communities. The problems will differ depending on the market, but we must be imaginative and effective in our alignment of our long-term needs for financial success with the solutions-oriented approach of our capitalist models to help address the social and developmental challenges of our times.
By 2020, according to one estimate, close to three-quarters of all jobs in America will require advanced skills and offer high pay. Approximately 123 million American workers will be needed to fill these positions. The problem is, at current high school and college graduation rates, only 50 million Americans will be qualified for these jobs.¹

Do these numbers get your attention? They certainly grab mine. They point to an astonishing shortfall that threatens the ability of American business to find and develop the talent that is critical to the creation of economic value. This gap also has the potential to endanger our country’s long-term competitiveness in the global marketplace.

That’s why I believe the business community has an important role to play. The health of America’s companies is closely linked to the communities in which they operate. So, business has a responsibility to help develop the next generation of talent, and there are a number of things business leaders can do. We can be advocates for innovative ideas. We can make targeted investments to bring promising models to scale. We can become personally involved in helping students connect the dots between classroom learning and workplace success.


Strategic Private Investment in Education

There is mounting evidence that targeted investments can produce solid returns in the form of better educational outcomes. And given that less than 1 percent of K–12 funding nationally comes from private sources, the incremental impact of these investments can be substantial.

The history of Teach For America, which started in 1990 with 500 teacher placements in six low-income communities, offers a powerful case study. Despite an innovative, effective model and encouraging initial results, Teach For America was struggling for financial survival in 2000. Luckily, that same year, Gap founder Don Fisher gave the initiative an $8.3 million grant that was contingent on matching funds from other donors. The grant helped Teach For America earn the federal funding it needed to scale the organization. Today, it places more than 8,200 teachers in the most challenged schools in 39 communities.

This story illustrates how strategic private funding at crucial moments can bring effective programs to scale. We hope to find many more. Our giving at AT&T is guided by a strategy that identifies and funds pro-
grams that need private-sector support to reach scale. My company has a tradition of driving innovation in communications, and we want to do the same thing in education. Nothing would please us more than to drive the next big idea in school success and workforce readiness.

Connecting the Dots between Educational Achievement and Successful Careers

The business community is in a unique position to help address one particular weakness in today's education system: classroom curricula that are not relevant to the skills needed to compete in tomorrow's job market. That's why AT&T has invested in two programs that help students understand how school success can determine career accomplishments.

The first is Roadtrip Nation, an interactive curriculum that exposes students to leaders in their community and helps pupils explore and refine their career goals. The initial launch of the initiative in 2008 brought the program to 2,000 students in rural communities in California's Central Valley. Today, with help from AT&T, Roadtrip Nation is set to reach 100,000 students in the next academic year. The curriculum has gained the support of organizations such as the College Board and the U.S. Department of Education. In fact, Secretary of Education Arne Duncan was interviewed by Roadtrip Nation students from Yonkers this spring. The curriculum will soon be available online, which will exponentially increase the number of students who can benefit from this innovative program.

In another approach to help students to see the real-world connection between school and work, our company has partnered with Junior Achievement Worldwide to create a job-shadowing initiative that will offer 100,000 students the opportunity to interact with AT&T employees as the employees perform their daily jobs. Across the nation, some 50,000 students have already gained new insights into the world of work through this program. These students won't all end up in communications careers, but they will gain an understanding of how critical education is to success in our industry or any other.

Setting the Standard

These are just two examples of how businesses can play a role through targeted investments in programs that are accountable for results and becoming personally involved with students. We need more of both.

Business leaders can also be more visible in the public policy discussions at all levels of government. No one understands the importance and the challenges of finding qualified workers better than we do. And no one can be a more credible advocate for policies addressing workforce readiness—defining the skills businesses need and demanding greater accountability.

What's especially encouraging is that we are joined in these efforts by a number of new and promising governmental initiatives. President Obama and his entire administration have made education a priority by allocating billions of dollars for Race to the Top, turnaround grants, the Investing in Innovation program, and other competitive projects. With the support and leadership of the president and Secretary of Education Duncan, the administration is implementing innovative approaches to achieve our shared goals. I applaud them for taking these bold steps.

We all agree that more progress must be made. As business leaders, we have an economic and a moral stake in making sure our nation's young people are better equipped to succeed in tomorrow's workforce. That's why we must be active and innovative participants in education reform. The future of our economy depends on it.
In a world where technology holds the key to addressing problems as global as renewable energy and climate change—and as local as maintaining an auto’s engine health—the most successful businesses, industries, and nations are those whose policies and people fuel innovation. As both the pace of innovation and the need for problem solving accelerate globally, the United States faces a competitive gap that we can close only if we change the ecosystem of education. We must place greater emphasis on equipping our workforce through lifelong learning—a process that starts at birth, continues throughout employees’ working lives, and extends into their senior years.

This new paradigm will require us to revise our assumption that education is received for 12 to 16 years in formal, lecture-type settings. The new educational model will instead reflect how people—not only in their youth, but throughout their entire lives—will learn, unlearn, and relearn to succeed in a constantly evolving world. This will require a broadening of the responsibility for “education” to public-private, academic, and business partnerships. Government, academia, and industry all face critical and imminent shortages of teachers, scientists, engineers, and technicians.

This is a global circumstance; no single nation can produce enough creativity, talent, or knowledge to meet today’s challenges alone. But the problem is growing acute in the United States. The many seasoned and skilled workers of the baby boom generation are (or are becoming) eligible to retire, and insufficient numbers of capable workers are being prepared to replace them. (I emphasize “capable” because we face a skills shortage, not a labor shortage.)

Most jobs today require at least some level of technical savvy, creativity, analytic aptitude, an ability to communicate and work with others, a global perspective, and the capacity and desire to learn new ways of thinking and doing. Technology-based companies like Boeing have an even greater need for employees with these attributes.

To produce this new knowledge worker, broad-based formal and informal education reform will be needed. It will require unprecedented cooperation and commitment from citizens, educators, parents, governments, civic organizations, nongovernmental advocacy groups, and businesses to ensure that:

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**Jim McNerney**
Chairman of the Board, President, and Chief Executive Officer of The Boeing Company
People acquire new knowledge, skills, and talents (and are flexible and open-minded enough to unlearn old ways) to enhance their employability, problem-solving abilities, and productivity.

Educators, governments, and others enable, integrate, and encourage the process—not impede it to protect the status quo.

Companies provide large-scale systems-integration expertise; disseminate business, technology, and market knowledge; and establish links between formal and informal education.

I cite Boeing’s actions in these areas as examples of some first steps.

Early Childhood
Science has demonstrated that early experiences shape foundational cognitive, emotional, and social capacities. Studies have shown that children who lack high-quality learning environments in the first five years of life can lag one to three years behind their peers when they enter kindergarten and tend to fall further behind unless they are given direct access to special resources. Studies also indicate that once children who have had access to quality early-learning environments grow up, they tend to exhibit better cognitive and social skills, creativity, and emotional resilience (all of which are critical to success in the workforce); have steadier employment and more stable families; earn higher wages; requireless remediation; and have lower rates of incarceration, teen pregnancy, and substance abuse. Boeing is beginning to focus additional attention and resources on efforts to increase the number of children who enter kindergarten ready to progress through the educational system.

Primary and Secondary School
Boeing supports systemic, continuous improvement in primary and secondary school systems around the world. Each year, for example, Boeing sends nearly 100 teachers to Space Camp, and the teachers return to their classrooms with the latest science expertise and renewed enthusiasm. In the United States, Boeing engineers serve as volunteer mentors to student teams that build competitive robots—a program that helps develop and nurture math, science, and engineering interests and skills. Boeing also helps link universities and professors with high schools, junior colleges, and teachers to strengthen understanding of the foundational experiences students need if they pursue a college degree. For example, one Boeing project engages high school students in the same virtual-reality engineering and manufacturing scenarios that our company helped a university create for its own students.

Vocational Training
The diminishment of vocational training in the United States has added to the skills gap. Today, about one-third of the four million children born each year in the United States will not graduate from high school—in many cases, simply because they don’t plan to attend college. While significant numbers of U.S. jobs don’t require a degree, many go unfilled because they require some level of practical math or computer skills and technical aptitude. A robust approach to vocational education can provide students who are not bound for university with greater chances for employability. In one partnership, Boeing works with community and technical colleges in the Seattle area to train both our own employees and other students to work with composites and other materials and technologies.

Higher Education
Boeing advocates the creation of connections between business and educators. Through an annual fellowship program, we bring competitively selected professors from a variety of disciplines into the company for eight weeks to not only improve their understanding of the practical applications of their knowledge, but also to help us identify areas for possible improvement. Boeing partners on research and development with key universities in the United States and around the world. By doing so, we provide real aerospace-industry experiences to students and faculty; we also learn from and apply their technologies and expertise to our own business.
Career and Work Life
Boeing offers employees mentoring, training, rotational assignments, communities of practice, and collaboration tools that help them learn from one another. We also invest more than $110 million annually in tuition assistance for employees’ higher-education coursework, as well as stock-equivalent grants for degrees completed at accredited institutions. (In 2008, nearly 15 percent of employees continued their education through this program.) In addition, current and aspiring leaders may attend classes through the Boeing Leadership Center, where participants team up to tackle actual business issues.

Retirement
A 2004 publication by the National Center for Educational Statistics found that 68.5 percent of U.S. middle school students are taught by math educators who have no major or certification in math. For general science, 57.2 percent of teachers did not have a major or certification in that field.

As a result, in part, of two Boeing pilot projects, the Aerospace Industries Association has recommended that retirees consider mentoring or obtaining certification and teaching (paid or volunteer, full or part time) at the primary and secondary school levels—both to provide qualified math and science education and influence the career aspirations of students.

Conclusion
Changing the ecosystem of education is critical to the future of the United States and its competitiveness as a nation. The process of change must start with a wide-ranging discussion about the most effective strategies to adopt—partnerships between industry and academia, improved teaching methods that develop the critical attributes students need, and economic investments. With a focus on integrated, active, and ongoing learning, we can improve our educational system, accelerate the novice-to-expert timeline, and equip future workers to solve the many problems we don’t yet know exist.
For business to thrive, companies must be able to employ people with the right skills, ambition, and mindset. Without the steady inflow of new talent and the continuous development of existing talent, sustainable growth will remain elusive. At Philips, we know this very well. As a global health and well-being company active in the areas of healthcare, lifestyle, and lighting, our business revolves around people: not only patients and doctors, architects and designers, and consumers and end-users, but also our more than 115,000 employees.

We are living through difficult economic times, but it would be a great mistake to neglect the issue of workforce readiness because other challenges may seem more pressing. In the current economic climate, workforce readiness is more, not less, important. This holds true for each individual, but also for companies and countries that seek to increase their competitiveness. If the qualification level of your current and future employees deteriorates, you are bound to lose out in today’s recession and tomorrow’s recovery.

Workforce readiness is not only about increasing the skills of new entrants to the labor market. We also need to ensure that our existing employees make constant efforts to improve their employability. As the “job for life” era has come to an end, we need to foster “employability for life.” Regarding new entrants to the labor market, it is in the enlightened self-interest of business to partner with governments and educational institutions to increase the workforce readiness of today’s students and the unemployed. At Philips, we are working to achieve this all over the world.

China During the last few years, hundreds of students at Fudan University in Shanghai have increased their practical knowledge of intellectual property (IP) at the Philips IP Academy. Experts from Philips teach these students essential skills in the areas of patents, copyright, trademark, and design. Similar IP Academies are up and running at Renmin and Tsinghua Universities in Beijing and Shenzhen, respectively.

United States Philips sponsors a group project at the Boston University School for Management for students who specialize in healthcare. Teams of students are presented with real-life case studies and asked to identify solutions and build business cases. These programs allow them to develop a good feel for what will be required of them in a business setting.

The Netherlands In the country where Philips was founded well over a century ago, we have developed a successful
program to increase the basic qualification level of unemployed school leavers and adults. Since 1983, over 12,000 people in the Netherlands have benefited from training and work experience offered through the Philips Employment Scheme. This program’s success is borne out by the fact that 76 percent of the participants in 2007 found a paid job. We are also working hard to rekindle the interest of youth in such science subjects as mathematics, physics, and chemistry. While the number of local undergraduates studying these subjects in many Western countries has dropped to an alarmingly low level, Philips is helping turn the tide in the Netherlands through cooperative agreements with schools that have achieved encouraging results.

These are just a few examples of the many practical initiatives Philips is directing across the world. But it is just as important to ensure that today’s employees maintain a high level of employability. In a business environment that changes faster every day, our employees have to update their skills and be willing to explore new professional avenues and challenges. This need for constant learning and exploring is especially pressing in aging societies, where people may well be expected and/or willing to continue their working life beyond the current retirement age.

New markets develop at a breathtaking pace, and companies sometimes transform themselves beyond recognition in a matter of years. Philips, for example, has transformed itself from a vertically integrated industrial electronics company to a people-centered, customer-and-market-driven company focused on health and well-being. In this dynamic environment, a company’s employees, managers, and leaders must be able to adapt, and they must possess the basic skills needed to acquire new skills.

As a company operating worldwide, we must also adapt our global employability strategy to the local needs and customs of new regions and countries. Philips makes a strong effort to improve the language skills of our employees, including opportunities to improve their English, which is our company language.

By improving their social and language skills, our employees can feel at ease and perform effectively when they meet colleagues and partners from all corners of the world. The employees at Philips’s headquarters in Amsterdam alone represent 33 different nationalities. In such an environment, intercultural and communication skills are vital.

At Philips, efforts to increase employability are a partnership between the company and the employees. As a company, we provide the means and encouragement, while the employees take clear responsibility for their own efforts. A new initiative in Europe offers a clear illustration. We recently introduced “e-miles” (employability miles) into our collective wage agreements in the Netherlands. Employees can use their e-miles to “buy” access to workshops, questionnaires, or interviews that allow them to better understand their own aspirations and skills. This is a first step toward ensuring that employees remain in the driver’s seat of their own careers and are able to find suitable, challenging jobs—whether inside or outside of Philips.

When it comes to workforce readiness, companies should be active, open, and willing to form coalitions. Obviously, it is not always easy for governments, educational systems, trade unions, and businesses to work together. But we all must make an effort. Businesses, for example, should be more assertive in defining the skills they expect from students or the unemployed who (re)enter the labor market. We should also foster exchanges between business and the educational system at all levels—from company employees teaching at universities to work placements for students.

In this day and age, we can hardly overestimate the importance of workforce readiness. What is at stake is our economic well-being and our social cohesion, two essential cornerstones of a sustainable society. Workforce readiness is well worth a strong effort.
The last 100 years have seen a rapid change in the pace of innovation that has driven economic and social growth. If someone from 1909 were to arrive in 2009, he or she would be baffled by the state of technology, business, and social behavior. The skills required for doing research, business, manufacturing, and services jobs would appear drastically different. Cut to 2100: Do we have any inkling of how people will interact socially and economically? Of the technological breakthroughs that will have taken place in energy, medical sciences, communication, transportation, and leisure activities? What kind of geopolitical framework will manage the affairs of the world? What trends in automation will have made many of today’s activities redundant? Most important, what social and corporate behaviors will be in place due to environmental changes and climatic shifts?

Even the next 30–50 years will witness some amazing shifts. As the world becomes more connected, nations will compete aggressively to leverage their strengths. Over the past two decades, a nouveau middle class in the emerging markets has created a market that behaves outside the accepted norms. The members of this class are investing in education and human capital based on the current context. What does it mean if a large chunk of the global population is equipping itself for today’s jobs when they do not know what tomorrow’s workplace will demand?

Driven by changing demographics, skill gaps, worker mobility, market forces, globalization, and technical advances, the workplace environment is already changing rapidly. Communities, governments, businesses, and educational systems will need to take this transformation into account. Competencies and skills will have to be leveraged globally. Tomorrow’s workplaces will combine physical and virtual spaces, and they will require shifts in skills and work culture to deliver results. This will, in turn, require new business, sourcing, and HR models. How are today’s businesses planning for this shift?

As a popular video on YouTube entitled “Shift Happens” notes, universities haven’t even started teaching the skills required for the jobs that will exist 15–20 years from now. By 2050, there will be a global workforce of 5–5.5 billion. About half of these individuals will work in sectors that address
the needs of the world population—agriculture, manufacturing, and basic services—and the other half will have to engage themselves in value-added services. But we don’t yet know what this future will look like or what skills workers will need to possess. Early movers will set the pace for the transformation and define the rules of engagement, just as Google and Facebook did during the last decade. This vanguard will also set the trend in new skills and the way these skills will be leveraged.

The skills gap will persist, however, because of the lag between the way businesses and educational systems evolve. At Infosys, we invest heavily in addressing this gap and in retraining as technologies evolve. Just as automation made many jobs in agriculture and manufacturing redundant in the last century, it is likely that there will be automation in services requiring intellectual capital. We are cognizant of these kinds of evolutionary models and continuously innovate to add value to our clients.

For any corporation, and especially one in the services sector, people costs account for the largest chunk of the expense side of the balance sheet. Hence, there is a continuous effort to increase value and workforce utilization. New sunrise sectors will absorb talent, leaving traditional sectors struggling for resources. India’s IT sector is a classic example of how an industry can absorb both talent emerging from the system and experienced resources from other sectors. This forced other sectors to reexamine their business models and workforce policies. In the cycle of change, today’s emerging sectors will become tomorrow’s legacy players. As jobs evolve, many of today’s low-skill and repetitive jobs will turn into complex and mature services requiring advanced skills. In the last 100 years, for example, traditional jobs in banks have changed from ledger management and the oversight of simple deposit and lending services to a consulting role that involves advising clients on various products and offerings.

As economies advance, the skills gap between supply and demand will force businesses to evolve new models to make their workforces more mobile, fungible, and agile. Workforces will be smaller (or will operate as smaller groups within large organizations), more balanced in terms of gender, more culturally and ethnically diverse, and less loyal (meaning employees will be more willing to move on and explore new opportunities). Also, as people live and work longer, issues of generational diversity will become more visible. How will businesses adapt to this changing mix of employees? How will they respond to increased employee expectations about workplace environments and rules?

Zen master Suzuki Roshi says, “In the beginner’s mind there are many possibilities, but in the expert’s mind there are few.” In many ways, this quote captures the challenge that faces the new and the traditional players. Tomorrow’s workplace will need to capture this essence. While individuals must be allowed to be more creative, they must also become more aware of their company’s business objectives and more responsible for the outcomes based on those goals.

Will the Internet be the site of the workplace for tomorrow? Maybe. Connectivity and bandwidth issues are increasingly being resolved, and biometric security is making remote computing even more secure. These technical improvements will continue to bring online interactions closer to real-life experiences. Any need to travel or meet can be accomplished through these new platforms, and video-conferencing systems like Telepresence and Halo are already making physical proximity irrelevant. What role will a workplace’s physical infrastructure play in creating the identity of the organization? How will a company define its culture when people know each other only through a virtual presence?

Finally, climate change and other environmental issues represent the biggest unknown influence on the workplace of the future. Will we find alternative energy that is cheap and clean before we run out of oil? Will CO₂ emissions be controlled before we reach (however it is defined) the “point of no return”? Do these scenarios mean the end for some businesses? What will new businesses look like? Will they operate differently? What kind of skills and expertise will they require? How will people grow in these organizations?

These are only some of the many questions that need to be considered by companies keen on building workplaces that will develop their future employees and support their future businesses. It is better we know the questions before we seek the answers.
One of this century’s critical challenges will be providing sufficient energy to fuel continued economic development around the globe while stabilizing or even reducing CO₂ emissions. This will not be easy. Energy, prosperity, and the environment are intimately interlinked. When societies become wealthier, they consume more energy. When fossil fuel consumption goes up, so do CO₂ emissions.

We all know that global demand for energy is growing, but the reality of how fast hasn’t really sunk in. Thanks to surging populations and greater wealth, demand will at least double by the middle of the century. The world’s population could reach more than 9 billion by then, up from about 6 billion today. China, India, and other populous countries have entered the energy-intensive phase of their development; it’s the point where people buy their first television or car and start consuming much more transport fuel and electricity.

To illustrate the speed of development, in China today there are 40 million cars on the road—three cars for every 100 inhabitants. By 2020, there could be 150 million cars. This is still only 12 per 100 people, well below the American or European average, but fueling those cars will require an additional 2 to 3 million barrels of oil per day—equivalent to the current demand of Germany.

CO₂ emissions, meanwhile, could outpace the growth in energy demand. The International Energy Agency’s business-as-usual scenario predicts emissions will rise 55 percent between 2005 and 2030. That’s because much of the new demand for energy will be met by fossil fuels, especially coal.

To reduce dependence on imported oil and gas, countries like China, India, and the United States exploit abundant domestic coal reserves. Already, coal supplies about 70 percent of China’s primary energy. To fuel its double-digit economic growth, it will need to double coal use by 2030. The United States, for its part, generates more than 50 percent of its electricity through coal. Applying the latest technologies—coal gasification, in particular—will be vital to ensure a cleaner use of this important resource.

Coal gasification has the advantage of facilitating the capture of a relatively pure stream of CO₂ for underground storage in aquifers or abandoned gas and oil reservoirs, a technique called carbon capture and storage (CCS). The United Nations’ Intergovernmental Panel on Climate Change believes CCS is the most promising technology for significant and rapid reduction of global emissions. Of the total emissions reduction needed to stabilize world CO₂ levels by the end of the century, CCS could potentially deliver 55 percent. However, since there is no natural market for big volumes of CO₂, government incentives will be needed for CCS to have the impact that is needed.
It’s a daunting challenge: To keep greenhouse gases in the atmosphere at around 450 parts per million, which is where scientists tell us we should be. Shell works with models that assume CCS is installed at 90 percent of all the coal and gas-fired power plants in developed countries by the year 2050, and 50 percent of those in non-OECD (Organisation for Economic Co-operation and Development) countries. Today, there’s not a single one. And this would be only one element of a much broader set of necessary measures.

A second approach is to boost the use of renewable energy, such as solar and wind. Many companies see this as a business opportunity, including Royal Dutch Shell. That’s why we are investing in wind power, solar research, and a new generation of biofuels produced from nonfood crops and biowaste. But renewables are starting from a small base. Today, wind, solar energy, and biofuels together account for less than half a percent of global energy supplies. Fossil fuels make up between 80 and 85 percent of the global energy portfolio and will continue to dominate the global energy mix well into the next century. A major part of the remainder is made up of nuclear energy, which continues to generate controversy that may hold back its expansion. To illustrate the challenge of shifting to renewable energy, if the United States were to convert its entire corn yield into ethanol, it would still only produce around 15 percent of its gasoline demand.

A third solution is to become more efficient and economical in our use of energy. I like to say that the best way to use energy is simply not to use it. Right now, the world wastes more energy than it uses in a productive way. In the average car, about 20 percent of the fuel burned is turned into passenger miles; the rest is lost as heat. For an airplane taking off, the figure is about 8 percent. In the average coal-fired plant, roughly 35 percent of the coal burned is converted into electricity; the rest, again, is lost as heat.

Energy losses will always occur during conversion and distribution, but efficiency gains must and can be made in all sectors of the economy—be it transport, industry, power generation, or the residential sector. For instance, in the newest types of coal-fired plants, efficiency typically goes up to more than 40 percent. And if U.S. cars were as efficient as European cars—an improvement of nearly 40 percent—this could cut U.S. oil consumption by nearly 3.5 million barrels a day or the equivalent of the combined daily oil consumption of France and Britain.

If we are to meet the energy challenge successfully, now is the time to put the right policies in place. And that is why governments have a particularly important role to play. They must provide the regulations and economic incentives that encourage both investment in new technologies and energy conservation. An important element of such a framework is a long-term, cross-border approach to capping CO₂ emissions and creating a market where companies and others can trade emissions credits.

The geographical scope of such emissions trading should widen to include the United States and as many other countries as possible. California’s efforts to ensure compatibility between its own planned cap-and-trade system (and a possible future federal U.S. system) and that of the European Union are hopeful signs. Trading mechanisms should not only put a cost on the CO₂ that is emitted, but also provide credits for the CO₂ that is either captured and stored or prevented from escaping into the atmosphere—for instance through investments in low or zero-emissions energy or through creative solutions, such as the CO₂ Shell supplies to the soft drinks industry and to greenhouses to boost the growth of vegetables.

The essence of sustainability is preserving for future generations as many options and choices as we benefit from today. It’s a collective responsibility, and everyone must do his or her part. Governments must create the right international framework and spirit in which innovation can flourish. Scientists will have to make progress through fundamental research in areas like nanotechnology, robotics, and biotechnology. The energy industry will have to relentlessly drive energy efficiency in its operations and processes and bring new technologies to market. Consumers will have to become more aware of the value of energy and the need to use it sparingly.

While the road to a solution is long and filled with potholes, I believe there are plenty of reasons to be optimistic about our ability to address the global energy challenge, provided we work together.
Sustainable development is a major and pressing issue faced by all countries. Since 1992, when the United Nations Conference on Environment and Development (UNCED) passed the Rio Declaration on Environment and Development and the 21st Century Agenda, the governments of nations around the world have been making unremitting efforts to promote economic and social development in harmony with their population, resources, and the environment.

China attaches great importance to sustainable development, so we stress scientific planning that strikes a harmony between man and nature. We are committed to a society that uses resources economically and in an environmentally friendly fashion. As a responsible large country and the largest developing nation, we recognize that our nation’s pursuit of sustainable development is important to the world community.

China is in a period of industrialization, urbanization, marketization, and internationalization—changes that are interwoven, advancing shoulder to shoulder, and developing at an accelerated speed. It is confronting increasingly more rigorous challenges in sustainable development, especially in view of the fact that the urbanization of 1.3 billion people fundamentally changes the social and economic fabric of China, even as it becomes the principal driver for development. Accelerated urbanization has brought about problems, including a shortage of land, water, and mineral resources; environmental pollution; and ecological destruction. These problems seriously inhibit the progress of China’s urbanization and complicate the process of sustainable development of the entire Chinese economy and society.

To realize sustainable development, China always must consider both its own condition and the lessons to be drawn from international experience:

- **The matter of first importance is development.** The demands of a backward country for accelerated development are very pressing. Without development, sustainability does not have any real or long-term meaning. To realize sustainable development, it is necessary to use scientific methods to solve a host of contradictory and conflicting issues, values, and problems.

- **Planning for scientific development is the prerequisite.** A developing country by definition is a backward country, but even backwardness presents opportunities. We can leapfrog past incremental technical progress and plan sustainable development via leading-edge technology, but this is only possible after
thorough and well-considered advance planning. We can promote development of the highest quality and efficiency, but such development requires a comprehensive and systematic strategy, planning, and design, taking into consideration the interests of all concerned and integrating existing resources with new ones.

• **The market and the system are the foundations.** The market is the foundation of economic operations, and the backwardness of its markets is a major bottleneck restricting China’s development. Blind and disorderly development in developing countries is closely associated with the unreasonableness of resource disposition, which is, in turn, a product of defective markets and systems. This requires accelerated development in building, cultivating, and developing markets. Market development is China’s fourth largest economic driver, behind investment, consumption, and exports. Relatively speaking, China’s economic growth is only lightly affected by the impetus of organic growth and efforts at improving industrial efficiency.

• **Science and technology are the keys.** Development at the cost of significant environmental degradation or wasteful use of resources must be prohibited. Out of necessity, we are changing conventional ideas and practices associated with the economic phenomenon known as the “extensive growth mode.” We continually elevate the science and technology of our development to minimize resource consumption and maximize protection of the environment. These are key notions behind our drive for sustainable development.

• **Business enterprises should bear social responsibilities concerning their operation and development.** Sustainable development is achievable only if China raises the consciousness of the whole society because China intends to ensure sustainability by relying on the joint efforts of government, business enterprises, and individual citizens. In particular, business enterprises that have taken maximization of profits as their sole value orientation must be taken to task. Long-held ideas can be long-outdated ideas—development of business enterprises must proceed hand in hand with notions of sustainable development of the overall needs of the economy and society.

China Development Bank (CDB) has, over a long period of time, devoted itself to our nation’s sustainable development. We at CDB recognize that backward markets and ineffective planning impede China’s development, so we regard the building of efficient financial markets as an important element we must integrate into every CDB activity. This is the starting point for all of our bank’s financing activities, proceeding from planning through the operation of completed projects. We have consciously accepted the burden of social responsibility we see as allied with development finance. We use financing as the carrier for integrating the interests of all of the elements of society. We combine the building of active, modern, efficient, and transparent markets, which is part of our mandated mission from above, with the spontaneous, interest-driven efforts of our borrowers and affected stakeholders from below.

The universal result is to create healthy, highly efficient, and universally beneficial market and financial systems—foundation predicates for sustainable development. Further, we have financed projects costing tens of billions of RMB for activities specifically intended to improve environmental values. Examples of such projects are those whose primary objectives are energy saving, greenhouse gas reduction, environmental protection, pollution control, and economic use of and recycling of resources.

At CDB, promoting sustainable development is not an afterthought. We believe and practice our work mindful of the standards of the state for the environment and energy saving—these are prerequisites to our financing. We have gone further and taken the initiative as a force for fundamental change.

In 2006, CDB raised its level of social responsibility acceptance by joining the Global Compact of the United Nations. We now identify ourselves as an organization in a global society where our past work in promoting sustainable development has alerted us to greater needs and spurred us to take on a deeper level of involvement for the betterment of China and the rest of the world. We intend to wear that mantle proudly.
DuPont is in its 205th year as an enterprise and has grown and moved in directions that my predecessors would find surprising. We began as an explosives company. Today, we are on the leading edge of biotechnology and nanotechnology. We have transformed our company several times in our history, constantly challenging ourselves by asking: Are we doing the right things to build a stronger company, help solve the world’s toughest challenges, and build a brighter future for people and our planet?

To do that in the 21st century, we have to keep pace with the evolving idea of sustainability. In the 1970s and 1980s, that meant a focus on internal safety and meeting environmental regulations. In the late 1980s and 1990s, we added voluntary environmental footprint reductions that went beyond regulatory requirements. Today, we see ourselves in a third phase of sustainable growth, characterized by a holistic approach fully integrated into our business models.

Now, sustainability has been broadened to include human safety as well as environmental protection, and it has become a market-driven business priority throughout the value chain. The transition to products that meet the definition of “sustainable” will take place over time and emerge from dialogue with stakeholders, including governments, NGOs, and academia. Science and innovation that does not address pressing human needs will not advance sustainability. Likewise, a vision of sustainability detached from science and technology will not succeed.

Meanwhile, we never forget that we are a business, and our first job is to create value for our shareholders. Sustainable growth means creating value for our shareholders and for society by developing products that the market demands. Some companies say that what’s good for the environment can also be good for business. Our view is that what’s good for business must be good for the environment or you are not moving toward sustainable growth.

To keep us on that track, we have found it useful to create goals. We developed our first set of environmental goals in 1989. In 2006, we created our newest set—what we call our 2015 Sustainability Goals, which renewed and expanded our commitment to sustainability.
Among this set of goals are what we call market-facing goals. We have four market-facing goals to accomplish by 2015:

1. We plan to double our investment in R&D programs with direct, quantifiable environmental benefits for our customers and consumers along our value chains.

2. We will grow our annual revenues by at least $2 billion from products that create energy efficiency and/or significant greenhouse gas emissions reductions for our customers.

3. We will nearly double our revenues from nondepletable resources to at least $8 billion.

4. We will introduce at least 1,000 new products or services that help make people safer globally.

To intensify our ongoing efforts to minimize the environmental impact of our operations around the world, we also updated and expanded our footprint goals:

- Since 1990, DuPont has reduced its global greenhouse gas emissions, measured as CO₂ equivalents, by 72 percent. By 2015, we will further reduce these emissions at least 15 percent from a base year of 2004.

- We will reduce water consumption by at least 30 percent over the next 10 years at our global sites that are located where the renewable freshwater supply is either scarce or stressed, as determined by the United Nations’ analysis, and keep water consumption flat at all our other sites.

- By 2015, 100 percent of our offsite fleet of cars and light trucks will represent the leading technologies for fuel efficiency and fossil fuel alternatives.

- We will reduce our air carcinogen emissions by at least 50 percent from a base year of 2004 and bring our total reductions since 1990 to 96 percent.

- We will ensure that 100 percent of our global manufacturing sites have completed an independent third-party verification of the effectiveness of their environmental management goals and systems.

To achieve these objectives, we’re relying on the creativity and commitment of our 60,000 employees around the world and also on partners who share our commitment and have the influence and ability to take actions that will make a difference. Consider developments in three areas of current activity—biotechnology, bio-based materials, and safety.

We believe biotechnology presents important opportunities that should be explored and developed to identify safe and commercially viable applications that will bring benefits to society. We are committed to improving our understanding of how to grow more nutritious food, particularly in areas that pose an agricultural challenge. For example, our Pioneer Hi-Bred seed business uses advanced plant genetics to develop field crops that are more productive, of higher quality, more nutritious, and better suited for specific uses.

A direct product of our biotechnology is our work in bio-based materials. In 2006, we announced a partnership with BP to create a new generation of biofuels that will help reduce the world’s dependence on oil while also providing economic opportunity to local farmers. Our intent is for DuPont to become a major player in bringing biofuels to market in a way that promotes sustainable agriculture. We want to make sure that the development of biofuels is accomplished in a way that does not take food out of some peoples’ mouths to put fuel into other peoples’ cars.

In bio-based materials, our joint venture with Tate & Lyle of the United Kingdom has developed a bio-based process for creating a major ingredient for DuPont™ Sorona® polymers, our newest polymer platform. The bio-route to this polymer uses 40 percent less energy than the traditional chemical route and will save the equivalent of 10 million gallons of gas annually—enough to power 22,000 cars a year.

We also are aiming to make further progress in improving the environmental profile of our traditional product lines. For example, our R&D pipeline is delivering next-generation refrigerants with lower greenhouse warming potential; new automotive finishes with lower volatile organic compound (VOC) content; and enhanced
solutions to improve solar module lifecycle and efficiency, building on our experience with eight DuPont products currently used in photovoltaic solar panels.

Because of our unique tradition of safety at DuPont, sustainability for us is not just about being an environmentally smarter company. It’s also about protecting people and keeping them safe. You know DuPont™ Kevlar® as a 40-year-old product that is used in protective vests, where it has saved the lives of 3,000 police and security officers. What you may not know is that Kevlar® is also used to reinforce high-performance automobile tires sold by Good-year. And it is being used to protect people from tornadoes and hurricanes through the DuPont™ StormRoom™ with Kevlar®.

Safety is also paramount in the early development of new products and technologies. We are working with Environmental Defense to understand potential risks of the emerging field of nanotechnology. Together, we developed a framework for responsible development, production, use, and disposal of nanoscale materials critical to “next-generation” communications devices and other products.

These examples show how sustainable growth is not a distant goal, but an immediate reality. Sustainable growth is about products and services we are working on right now. Sustainability is about investment in the future of our business, the future of our customers, and the future of families around the world. Sustainability is also about the future of our planet—the one we live on today and the better, safer, and healthier planet we aspire to leave for tomorrow.
Innovate or Die
Lessons from the Groundbreakers Who Changed America

When I recently conducted a Google search for “American chief executives and innovation,” I received 9,850,000 entries in just 40 seconds. By now, it may be up to 10 million or more. Obviously, no such search was possible when The Conference Board was established in 1916. Back then, I would have had to dedicate the rest of my life to discovering a fraction of what is now instantly on offer via the Internet, which is just one of the innovations undreamt of then that are now in the tissue of our everyday lives. Others include e-mail, antibiotics, television, statewide banking, FM radio, personal computers, the uplift brassiere, helicopters, instant cameras, cell phones, synthetic fibers, radio tuners, MRI scanners, scheduled airmail, transatlantic flights, fish fingers, microwave ovens, transistorized hearing aids, artificial insulin, lasers, jet planes—not to mention the introduction of container shipping that effectively initiated globalization.

Another Google search indicates that there has also been a subtle shift in American business thinking. When “innovation” is replaced with “efficiency” in the search string, only half as many entries appear. Efficiency, once the be-all and end-all, is no longer considered enough for survival in the world economy. F. Mark Gumz, CEO of Olympus America, keeps telling all of his staff (and not just the top managers), “Innovate or die.” To be sure, efficiency is essential, but, in a global marketplace, efficiency—and the cost-cutting associated with it—may not be enough. So our future will more likely depend on groundbreaking innovation. Yes, we must implement and develop efficiency, but without forgetting the animating vision that created the initial innovation. The mountain ranges of innovation are littered with the skeletons of the great corporations that lost sight of the summit they set out to conquer.

Jack Welch’s law applies—when the rate of change in a company becomes slower than the rate of change outside, the end is in sight.

Federal Express is one of the organizations that has managed to keep its focus. For three decades, Fred Smith has inspired his organization with his passion to make sure, absolutely positively sure, that the parcels are truly delivered overnight. As Smith says, “You’re delivering someone’s pacemaker, chemotherapy treatment for cancer drugs,
the part that keeps the F-18s flying, or the legal brief that decides the case.”1 His efficiency drives have not been allowed to obscure the founding vision.

**The Potential Downside of a Concentration on Efficiency**

Michael Dell, who conceived of mass customization of personal computers through direct selling to consumers—especially businesses and just-in-time manufacturing—has been every bit as innovative as Fred Smith. Because of the company’s consumer focus, Dell’s customers have felt they have an almost personal relationship with him. This relationship was hurt, however, when the company hired cheaper temporary workers for its five call centers rather than continuing with full-time staff imbued with the founder’s sense of mission. Ro Parra, a senior vice president at Dell, identified call-center turnover rates as high as 300 percent as one cause behind flattening sales. He told the *Wall Street Journal*, “We were very efficient and we made those decisions that work with the short term, but they were really damaging to us over the long term.”2 Such openness and contrition indicates that Dell will soon regain its momentum.

Not all businesses are able to regroup after such an event. Tony Ridder, for example, is no longer running Knight Ridder, an organization whose commitment to editorial excellence and innovations in newspaper technology helped it become America’s second-largest newspaper group. When Ridder told the editorial staffs his highest priority was increasing the profit margins from 19 percent to 21 percent, he was viewed as introducing a morale-lowering change in the corporate culture at the expense of a commitment to quality journalism. This perception was no doubt unfair, given his need to reconcile costs with the downturn in newspaper advertising. In any event, setting financial targets invited a financial judgment, and shareholder pressure led to Knight Ridder’s sale to the McClatchy Company.

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**Defining the Values of Innovators**

In writing my recent book *They Made America*, I spent five years trying to identify and describe the great change-makers in the business history of the United States. As a result of my research, it became clear that America’s progress over the past two centuries—from the steam engine to the search engine—has been very much related to the values of the innovators. Wealth was not at the center of their lives. To be sure, none of them sought penury in the service of the public, but immersion in their lives suggests that making money was not a sustaining motivation. Something else drove them—intellectual curiosity, vanity, genuine altruism—and then the money followed. I see these primary innovators as democratizers: Henry Ford, Amadeo Giannini, George Eastman, and Pierre Omidyar come to mind, but there are lesser-known people like Raymond Smith (founder of the first family of gambling in Nevada and the F.W. Woolworth of chance) and Martha Matilda Harper (creator of retail franchising) who deserve to be better known.

As the preceding list suggests, the individual dominates the story of American innovation. The research departments of major corporations (e.g., Bell Labs and Dupont) have not been unproductive, but can anyone have had more impact on our world than Malcom McLean? In 1937, McLean was a 23-year-old trucker who became frustrated after spending a day waiting on a noisy pier in Hoboken, New Jersey, to have his cotton bales unloaded from his truck, loaded onto a cargo ship, and then unloaded and loaded again at the other end. Recalling that frustrating experience, McLean said, “The thought occurred to me…. Wouldn’t it be great if my trailer could simply be lifted up and placed on the ship without its contents being touched?”3 It took 20 years for McLean to move from this initial inspiration to organizing the voyage of Ideal X, his first containership, from Port Newark, New Jersey, on April 26, 1956. Why didn’t anyone else see what McLean saw? Here is a hallmark of innovation—the imaginative association of ideas previously considered separate: the cell phone that takes stills and video and plays music. Auctions and yard sales had been around a long time

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3 Evans et al., *They Made America*, p. 482.
when Pierre Omidyar put them together on the web to create eBay. Jean Nidetch stitched together the communal support idea of Alcoholics Anonymous with a diet invented by the New York City Department of Health to create Weight Watchers. Ida Rosenthal did not invent the brassière or even the famous Maidenform “I dreamed” campaign, but she put all the pieces together in production and marketing so that her husband’s invention reached millions of women. Henry Ford summed up this aspect of innovation with admirable candor when he said, “I invented nothing new. I simply assembled into a car the discoveries of other men whom were centuries of work.”

**Business and Innovation: A Sometimes Uneasy Relationship**

A quick survey of those Google hits reveals that there is some confusion about the true definition of innovation. Much of what are described as innovations are really techniques of managing an existing business or improving it at the margins. These may be very useful, but they have nothing to do with innovation or change. Instead of parsing how the concept of innovation has changed from its initial conception in the 17th century to the refinements of modern commentators like Peter Drucker, Clayton Christiansen, and Eric von Hippel, I would argue we should reserve the terms “innovation” and “innovators” for real change and not confuse it with different functions. While there is a fairly common acceptance of Joseph Schumpeter’s definition of innovation as entrepreneurship, the reality is that entrepreneurship, the assumption of risk, may not be innovative at all. You assume risk if you open a new auto dealership, but you are not innovative unless you are the first.

Some entrepreneurs have even been the enemy of innovation. General David Sarnoff, the black-belt bureaucrat who was the head of RCA and was heavily invested in making AM radios, was a classic entrepreneur, but he was also the relentless and unscrupulous foe of the introduction of FM radio. While there is a fairly common acceptance of Joseph Schumpeter’s definition of innovation as entrepreneurship, the reality is that entrepreneurship, the assumption of risk, may not be innovative at all. You assume risk if you open a new auto dealership, but you are not innovative unless you are the first.

Some entrepreneurs have even been the enemy of innovation. General David Sarnoff, the black-belt bureaucrat who was the head of RCA and was heavily invested in making AM radios, was a classic entrepreneur, but he was also the relentless and unscrupulous foe of the introduction of FM radio. Even though he had the right of first refusal of Edwin Howard Armstrong’s invention, he did his best to sabotage Armstrong’s efforts to broadcast in this new medium. As a result, Armstrong, the inventor of so much in the technology of transmitting sound, was forced to start his own company and began broadcasting music flawlessly from WQXR in New York on July 18, 1939. (Interestingly, the 425-foot radio tower he built in Alpine, New Jersey, for WQXR was the salvation of NBC, and many others, when the antenna on top of the World Trade Center was destroyed in the September 11 attacks.)

Sarnoff also sought to stymie Philo T. Farnsworth’s attempts to make the most of his invention of electronic television, although, in the end, he had to pay Farnsworth for his groundbreaking patent. Later on, Sarnoff did become a genuine promoter of innovation, pioneering a system of color TVs compatible with black and white that defeated the non-compatible electromechanical system pushed by Bill Paley of CBS. But he was also a promoter of a number of myths about himself, including claiming credit as “the father” of television. When innovators such as Armstrong or Farnsworth are overlooked or their innovations misrepresented, it is more than a personal injustice; it is also a! distortion of the essence of innovation and the essential qualities of the innovator.

**Change Doesn’t Always Come from the Laboratory**

As we try to understand what true innovation is, we must not misunderstand a figure like Bill Gates. He is not an inventor. BusinessWeek has referred to him as the “software whiz kid” and People magazine has likened him to Thomas Alva Edison, whose photograph Gates keeps in his office. Gates is brilliant all right, but not at all in the way that Edison was brilliant. The criteria that elevate Bill Gates into the ranks of innovators are not in the realm of science and technology but in his genius for business organization and developing from scratch a standard-setting mass market company. He did not invent the operating system he licensed to IBM for its personal computer—he bought it from another company.

The true Edison of software is unquestionably Gary Kildall, who, entirely out of his own head and without the backing of a research lab or anyone, wrote the first language for a microcomputer operating system and the first floppy disk operating system. Kildall did it, moreover, in such a manner that programmers were no longer restricted by hardware compatibility. In Kildall’s system, anybody’s application could run on anybody else’s software. It
was the genesis of the third-party software industry.

But, while the breakthrough was Kildall’s, Gates was able to see more sharply how a deal with IBM could be the foundation of a whole new industry. He understood better than IBM the importance of owning its PC operating system. He also figured out how to set up a tollbooth to computer technology, collecting half of every dollar generated by the PC industry. In all these respects, the proper parallel for Gates is not Edison but John D. Rockefeller, who controlled 90 percent of the nation’s oil refining capacity by 1879, just as Microsoft Windows controls 90 percent of all personal computers.

**The Entrepreneur as Innovator**

Innovation in these areas of organization does not have the drama of Edison watching a filament fight for its life or Edwin Land finding himself split in two in the Polaroid color prints from his first experiments with the SX-70. Like Bill Gates, Juan Trippe, chairman of Pan American, was not an inventor. In the early 1950s, the activities in Pan Am’s Park Avenue offices may have seemed boring when compared with the struggle of Pratt & Whitney engineers to secretly create the monster J75 jet engine for the U.S. Air Force. But appearances can be deceiving. For Trippe was determined to make cheap mass air travel a reality and was ultimately responsible for introducing nonstop jet flights that carried hundreds of passengers from New York to Europe, first with the 707 and then the 747. At the time, the common presumption was that international air travel was the privilege of the rich and, moreover, the leaders of the airline industry considered jets too noisy, heavy on maintenance (a fallacy), too big for most airports, and too expensive. Cyrus Smith, the tough Texan who ran American Airlines, expressed the attitude of all airlines when he said, “We can’t go backward to the jet.” But Trippe could not have reached first base with this idea without persuading Pratt & Whitney to let him order J75 engines. At a lunch in 1955 with them, he put $40 million on the table, when he had no airframe and, indeed, did not have the $40 million. How he raised the money and induced both Douglas and Boeing to build the airframes exemplifies the courage—and the cunning—of the innovator in action, willing to risk all on something nobody had conceived of before. Trippe has yet to receive the recognition he deserves. The most recent portrayal of him in Martin Scorsese’s otherwise fine film The Aviator represents him as standing in the way of progress in the form of Howard Hughes and TWA. Hughes was no mean innovator himself when it came to airplanes, but he did not have Trippe’s early democratizing vision of the future of commercial aviation.

**A Good Invention Is Not Enough**

Another important confusion about innovation stems from regarding it as synonymous with invention and discovery. An invention/discovery does not become an innovation until it is put to use. This is not to devalue inventiveness. Juice, a recent study of inventors by Evan I. Schwarz, vividly highlights how some inventions have scaled upwards, “spawning continuous and endless improvement.”

The millions of patents that currently exist are hallmarks of invention, crucial in some industries and not in others, but they are not a reliable index of innovation. Less than 10 percent of patents turn out to have commercial importance, according to a study for the Lemelson-MIT Program, and less than 1 percent have the seminal importance of, say, Douglas Engelbart’s 1970 patent for the computer mouse or John Vaught’s inkjet for Hewlett Packard in 1975.

Those who come up with the best ideas for new companies were not always ready to run them. As Georges Doriot, leader of the first venture capital company on the New York Stock Exchange, observed, “There have been many fine scientists desperately trying to become poor businessmen.” For others, bringing their invention to market was not their primary motivation. Leo Hendrik Baekeland, the inventor of Bakelite (the first true plastic), had no wish to develop his discovery. He was repelled by the idea that it would mean becoming “one of those slave millionaires in Wall Street.”

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4 The Ewing Marion Kauffman foundation is sponsoring a national week of invention and entrepreneurship for young people from February 24 to March 2, 2007. Their website (www.EntrepreneurshipWeekUSA.com) already teems with stories of achievement.


6 Evans et al., They Made America, p. 372.
Street.” It was only when licensees failed to manufacture his revolutionary synthetic properly that he felt he had no choice but to lead his own manufacturing and distribution corporation. **Theodore Maiman,** having invented the first working laser on May 16, 1960, described it as “a solution looking for a problem” because so few appreciated its manifold possibilities. He too ended up founding his own company. He was first an inventor, then an innovator.

Other inventors have even walked away from the innovative potential of their achievements. The world would not be connected by telephone if it had been left to the inventive **Alexander Graham Bell.** Bell’s 1876 discovery of how sound waves could be converted into undulating electric current was critical, but his telephone was useful only if you had a good pair of lungs. It was **Thomas Alva Edison** (with Charles Batchelor) who invented the carbon button transmitter to solve the problem of indistinct and muffled sound in Bell’s phone. But it was **Theodore Vail,** an early supporter of The Conference Board and the organizational genius behind the formation of AT&T, who spearheaded the true innovation of establishing a private enterprise, integrated national telephone service. In doing so, Vail confronted a myriad of technical, political, and bureaucratic obstacles, including the threat of nationalization.

**Innovation Cannot Be Accomplished Alone**

Schumpeter tells us that invention + capital = innovation, but this neat formula rather understates just what is needed for an idea to proceed from a brain wave into the bustle of the marketplace. As well as money, my case studies suggest the importance of the innovator having a clear vision to communicate to others and a reservoir of patience few of us have. Success is more likely if one has an aptitude to lead a creative team in different disciplines. And let’s not forget the largely silent craftspeople who love and understand machines and systems and, by constant improvements in their operations, make innovations cheaper and faster. These qualities of leadership are manifest in **Dean Kamen’s** long development of the IBOT, a self-propelled chair on wheels that can navigate rough ground using gyroscopes and microprocessors. This is just the latest in a series of inventions associated with Kamen that, in the words of one profile, were initiated because “he decided [they] ought to exist.”

The richly varied demands on an inventor who aspires to innovation is the reason we see many innovators flourishing in partnerships of complementary skills or, as **Pete Peterson,** the chairman of Sony United States, calls them, a marriage of “interlocking neuroses.” In the early 1970s, **Herbert Boyer** was a brilliant molecular biologist happiest in his lab trying to induce *E. coli* bacteria to reproduce human DNA. **Robert Swanson,** part of a new breed of venture capitalists, was happiest reading balance sheets. With his heart set on building a practical business in the infant science of bioengineering, Swanson started cold-calling scientists who had written pieces in technical journals.

When Swanson dropped in on Boyer’s lab at the University of California-San Francisco in 1976, the distance then between biology and business was immense. One scientist remembers, “We were all standing in the hallway laughing at this guy in the three-piece suit. We just didn’t get people like that visiting us.” **Swanson asked for 10 minutes to pitch Boyer on the idea of making a commercial application of his discoveries. It was convincing enough for the two young men to walk to Churchill’s, a local hangout for molecular biologists, for a beer. They wound up talking for a couple of hours and put down $500 each to start a pharmaceutical company to explore the proteins that bacteria could be induced to make. They called their putative company Genentech, the forerunner of a roller-coaster $430-billion industry that has saved and improved so many lives.**

**The Grand Legacy of Thomas Edison**

The truly great innovators go beyond bringing a single product or service to the marketplace. They are notable systemizers who set the stage for an efflorescence of new products and whole industries; artificial insulin and then biotechnology; electric power and then cheap and

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7 Evans et al., *They Made America,* p. 217.
8 Scott Kirsner, “Breakout Artist,” *Wired,* September 2000
9 Evans et al., *They Made America,* p. 568.
universal electricity; the elevator and then the skyscraper; the transistor and then computers and software.

The invention of the incandescent light bulb that illuminates Edison’s name for posterity is not really his signal achievement. The innovative genius of Edison was to build out from the bulb to the creation of the electrical industry. He had to conceive a system down to its very last detail – and then manufacture everything in it. To give some idea of the enormity of the task, he had to:

• design and support a factory that would mass produce delicate filaments and preserve a vacuum in thousands of bulbs a day;
• build a central power station;
• design and manufacture his own original dynamos;
• ensure an even flow of current;
• connect a 14-mile network of underground wiring, insulating the wiring against damaging moisture and the accidental discharge of electricity;
• install safety devices against fire;
• design commercially efficient motors to use electricity in daylight hours for elevators, printing presses, lathes, etc.;
• design and install meters to measure individual consumption;
• invent and manufacture a plethora of switches, sockets, fuses, distributing boxes, and lamp holders;
• convince New York’s Democratic aldermen of its utility against the sabotage of the gas companies; and
• raise much of the initial capital.

Now there’s innovation!

Yet, while Edison introduced electricity into cities, it was his immigrant clerk Samuel Insull who found a way to make cheap power available to everyone. And Insull, in turn, depended on the brilliant George Westinghouse’s innovation of alternating current. As this chain shows, an innovator is both an explorer and a legatee, and we still have much to learn from them.

Protecting America’s Heritage of Innovation

One of the curious features of a country supposedly dedicated to business, and certainly one enriched by business innovation, is that political innovations and personalities are endlessly studied and rightly exalted, but, by comparison, the workshop and office revolutionaries are taken for granted in the boardrooms and neglected in the classrooms. Few innovators have touched so many areas of modern life or left such a stunningly complete record of their work as Edison. Today, a team of researchers at Rutgers University is seeking to make an immeasurably rich archive of Edison’s writings accessible to all through books, microfilm, and the Internet.10

Considering how many thriving businesses owe their prosperity to Edison—from the production and consumption of electricity to records and movies—it is hard to believe that this American treasure lacks proper funding. It should be supported—financially and not with words—by all who care not just about America’s heritage but its future, too.

By the same token, companies new and old would do well to cherish their archives. One of the surprises of the research for They Made America was how few bother to do it really well. United Technologies, which has taken meticulous care to preserve documents about the origins of its Otis elevators, is one of the few that does. It also kept the diaries of Elisha Otis. A sentence in one of his entries is suggestive of a major truth about America and innovation: “Machines [are] the tools of liberty.”

America’s business success in promoting innovation is related to the idea of America itself. Without the ideals that have animated this country, the innovations born here would never have so swiftly reached fruition. As society has progressed or retreated in achieving its ideals, and in resolving tensions between capitalism and liberal democracy, innovation has also progressed or regressed. America’s emergence as a preeminent economic power can never be explained by the access to physical resources or a large population, since Russia, China, Australia, Canada, Brazil, the Argentine, and South Africa were similarly well-endowed.

Freedom remains our most precious resource.

10 For more information on the Edison Papers Project, visit edison.rutgers.edu.
Does understanding how a political-economic system functions help us to understand how a business organization within that system functions? The answer is clearly yes. In both cases, structures are created to organize markets; the efficiency of the resulting exchange will determine performance, whether of the economy as a whole or of the individual enterprise. Businesses are themselves concentrated institutional structures that, like the markets they operate in, are always fine-tuning their organizations to perceive the world more accurately and to evolve strategies that help them perform. In short, businesses, like economies, organize labor, develop incentive structures, apply knowledge and technology, and monitor their own performance.

Also, in the complex interdependent world we have created, efficient business organization is intimately tied to the performance of the overall economy. But we only imperfectly understand the very complex nature of economic systems and the way they change. To improve that understanding and leverage it into institutions and their policies is the intellectual task of the economist. The practical challenge of the business leader is to enable this improved understanding to permeate the business organization in such a way that the organization uses it most effectively in a constantly changing world.

What is required is a deeper understanding of 1) how the mind interprets the external environment and 2) the process of decision making in a nonergodic world—that is, a world that is evolving in new and novel ways and at an unprecedented pace. Let us explore each issue.

First, by what means does any of us understand the external environment? The senses—eyes, ears, nose, and feel—send signals to the brain, which then constructs an interpretation of the external environment. This interpretation is reinforced or weakened as the senses provide additional signals consistent with it or at odds with it. Our beliefs are subjective interpretations made possible by the impressive development in humans of larger brains, language, and consciousness—that is, self-awareness of ourselves in time and space. The result is elaborate belief systems that explain where we are in time and space. Explanations— theories—account for our current environment and how we got there. But they are subjective and at best only partly correct.
In fact, history shows that our theories have been wrong more often than right, resulting in the demise of whole civilizations when we have misinterpreted what is happening to us. Given that only a small percentage of businesses around today were also present 20 or even 10 years ago, survival is a threshold challenge for businesses as well. We improve our chances of survival by continually developing better theories, grounded in empirical evidence of the ever-changing environment. Survival depends on a complex institutional structure that will provide the correct incentives for humans to continue to evaluate their surroundings critically and undertake the necessary changes when the evidence derived from additional information suggests the need for revision.

There is no guarantee that the essential institutional structure will, in fact, evolve. Indeed, throughout history, societies have disintegrated because they have failed to create such a framework. The rise and fall of the Soviet Union is the most recent dramatic illustration. I believe that the same issues are applicable to business organization and how it changes.

The second issue is that it is a non-ergodic world. If the world we are trying to understand remained constant and unchanging, then the lessons from past experience would serve as a guide to future choices. And, indeed, much of the theory developed in the social sciences assumes such a static environment. But if we human beings are continually modifying our external environment, the lessons from the past would help us solve future problems only to the extent these problems are similar to those of the past. Many of them are; but we are also creating new and novel worlds unlike anything in the past, and understanding what is happening to us is essential for our continual survival. How should we deal with such uncertainty? We can get some clues by looking at how humans have confronted uncertainty in the past.

Lessons from History
Throughout most of the human experience, the uncertainty humans have faced has been a consequence of the physical environment. Climate, weather, and earthquakes were the primary sources of uncertainty to be overcome or at least contained. The development of agriculture some ten millennia ago was a major breakthrough because it permitted humans to expand the resource base rather than, as hunter/gatherers, simply exploit the existing one. The result was the creation of civilization as we know it. But the consequent political, economic, and social structure that evolved became ever more complicated, and the uncertainties of human interaction—the human environment—replaced those of the physical environment as the most significant.

These uncertainties arise from transaction costs, which are the costs involved in human interaction, specifically the costs of measuring what is being exchanged and of enforcing agreements. That rather innocuous-sounding assertion is at the heart of the problems of economic efficiency. Throughout most of history, exchange has been based on personal knowledge of the other party. Reputation and repeat dealings have been the basis for confidence that the exchange would be lived up to in terms of both the quantity and the quality of the good or service exchanged and that the agreement would be executed in accordance with the understanding of both parties. Transaction costs in such cases were small. But also, markets were of necessity small.

As long-distance trade expanded in the Middle Ages, the difficulties of exchange between parties that did not know each other posed fundamental transaction cost problems. At the champagne fairs in France in the twelfth century, one merchant was designated to collect information on the reliability of the merchants attending the fair; when contemplating an exchange that was not instantaneous, a merchant would seek advice from the designated merchant on the reliability of the other party. But extending personal knowledge by such devices has limits with respect to the size of markets. And Adam Smith, the patron saint of economists, was unequivocal in his assertion that specialization, division of labor, and the size of markets are the source of the wealth of nations. Everything economists have learned since then reinforces this assertion.

Impersonal exchange—exchange between parties with no knowledge of each other and occurring over time and space—not only runs counter to innate genetic features of humans that evolved over the several million years that humans were hunter/
gatherers; it also is simply an open invitation to fraud, cheating, and corrupt practices. In fact, in the absence of the essential institutional safeguards, impersonal exchange does not exist except in cases where strong ethnic or religious ties make reputation a viable underpinning.

What is required is a political institutional structure that will put in place the rule of law and the necessary enforcement structure. The need to establish such a framework to guide business is at the core of why issues of transparency and corporate governance are so important. But the fact that such a framework must substitute effectively for the “trust” that comes with personal exchange means that establishing it entails a fundamental overhaul of both the economic and the political institutions. The failure to create the essential institutional base is the central problem of economic development.

**Institutions and Economic Performance**

Institutions structure human interaction. They are the incentive structure of a society and are designed to reduce the uncertainties of those players in a position to alter them. To understand the role of institutions in a society, we need to explore what they are, who designs them, and why they always work imperfectly.

Institutions are made up of formal rules and informal constraints, along with enforcement mechanisms for both. Formal rules are laws, rules, and regulations. Informal constraints are conventions, codes of conduct, and norms of behavior. Enforcement ranges from first party enforcement (humans living up to institutional requirements because they believe in them) to second party enforcement (retaliation) to third party enforcement (ranging from the force of peer approval to police, armies, etc.). All of these elements are present in the incentive structures and values-based leadership challenges of modern business organizations.

The structure of a political system, from authoritarian regimes to direct democracy, defines who makes the rules. The economic rules—property rights—are always made by whomever runs the political system and obviously are designed to reduce the uncertainties of those making them.

I can illustrate why institutions work imperfectly by exploring an analogous institutional setting—professional football. The rules, devised by the owners in the interests of maximizing their revenue, include both formal rules and informal norms (such as not deliberately injuring the quarterback of the opposing team); and there is an enforcement mechanism (referees, with the right to impose penalties for rule infractions). In fact, the way the game is actually played depends on the incentives and disincentives that arise from the complex interaction of the parties—owners, players, and referees. Taking out the quarterback of the opposing team may have a payoff that vastly exceeds any penalties, even assuming that the referees could perceive the action and judge it deliberate. The incentive structure of the rules, the accurate measurement of performance, the behavioral norms of the participants, and the effectiveness of penalties all lead to wide variation in actual performance, as even the most casual observation of the game attests.

The operation of a political-economic system has all these features plus one crucial additional source of variation—the game is continually changing as the participants evolve new aspects of it. The result is a crucial complication and uncertainty not present in a static setting. Survival in a nonergodic environment requires that the participants understand the implications of the evolving environment and make the necessary changes to ensure survival in such a setting.

**A Dynamic World**

Even the most cursory view of history makes one aware of the radical change that has occurred in the human condition. The uncertainties have shifted from those of the physical environment to those of the human environment, and we have only a vague understanding of the complexities of the latter. Indeed, uncertainty is the norm; risk assessment involves probabilities that are based on the past but of only limited use in responding to the future. The structure of society and, in this case, the business organization must enable uncertainty to be incorporated into decision making.

Individual social science disciplines give us insights into individual parts of a society, but these disciplines are seldom woven together to give us a comprehensive
picture of how a society operates; and they are static—telling a story at an instant of time when what we need is an integrated story over time. Nor do these disciplines confront the problem of understanding new and novel problems: How do the minds of those in charge of institutional change come to comprehend what is happening to us?

It would be comforting to believe that humans have been prescient enough to understand what is happening to themselves and act accordingly. But going back to the first issue—the way the mind understands the external environment—the beliefs humans construct to explain the external world are frequently incorrect, particularly if the changes are creating really novel situations. And clearly, humans have evolved environments radically different from anything that existed before. Can we create an institutional environment that will deal imaginatively with novelty?

There are success stories: the United States has evolved more or less successfully over more than two centuries. How did that happen?

The institutions created with initial settlement of the colonies were those carried over from Britain, which by the seventeenth century had begun to evolve property rights in land that encouraged individual ownership and was also in the course of creating what we view today as common law. Moreover, the colonies were not considered very important to England in the early stages and were therefore granted substantial autonomy and self-government. By the time the colonies became independent, they had the essential institutional underpinnings necessary for a productive economy and polity. Indeed, the Constitution was built up from the political and economic experiences of the colonies.

This was in striking contrast to the Latin American experience, where Spain, in its successful pursuit of “treasure,” provided no self-government and economic activity was generated by monopoly grants to individual merchants seeking to mine and export gold and silver. When Latin American countries (of Spanish origin) achieved independence, they frequently copied the U.S. Constitution, but absent the informal rules and enforcement that had evolved during the American colonial experience, the results were a half-century of recurrent civil war and subsequent instability.

The propitious character of early U.S. development explains how, with good fortune, we got it right to begin with. It does not explain the successful subsequent dynamic development as this country evolved from a rural small-scale society of about 5 million to a rich urban superpower of almost 300 million. Have we always known what we are doing? Clearly not, as miscues like the Civil War, one of the most costly and deadly wars in history, attest. (However, the historical heritage had created an institutional framework that produced rapid recovery, and today the South is a dynamic partner in the overall economy.) We have made many mistakes and still do. Indeed, the very nature of a non-ergodic world assures you that will happen.

But contrast the U.S. story with the history of the Soviet Union. The institutional framework of the former created an adaptively efficient structure, while the latter was rigidly constrained. The former encouraged trial-and-error experimentation, the latter did not. The development of an open access society—one that encourages entry into political and economic markets—creates an institutional framework that encourages such experimentation in the face of the uncertainties of novel change. The Soviet Union, founded on a set of beliefs that “knew the truth,” could make only superficial reforms in the face of increasing stagnation. Both societies were constrained by their heritage, which determined the flexibility of the resulting institutional structure.

Open-access societies confronted with uncertainty will produce an adaptively efficient structure. But it should be carefully noted that there is no guarantee that open-access societies will remain that way. The pervasive search for security in a competitive environment will encourage attempts to create monopoly, which if successful will dry up the wellsprings of adaptive efficiency.
Business Organization and Adaptive Efficiency

How much of this is relevant to modern business organization? Clearly, the dynamic success of the overall economy plays a critical role in the opportunity set of an individual enterprise. But more than that, the individual enterprise in a dynamic world is similarly confronted by uncertainty and must make choices that can be guided only partially by past experience. All the sources of uncertainty for an evolving economy are equally important for an individual enterprise—changes in information costs, technology, and competitive conditions. And all the sources of imperfect choices in devising institutions to deal with evolving uncertainty are equally applicable to the individual enterprise.

The constructions humans create to confront novel change in the overall economy or in individual markets require making choices in the face of uncertainty, and success is dependent on an adaptively efficient approach. In the case of the overall economy, improving the chances of successful survival depends on an institutional structure that:

1. creates a hierarchy in which the decision-making entrepreneurs have the interest of the economy as a whole, rather than their own private interest, at heart;
2. is adaptively efficient, encouraging experimentation in the face of the uncertainty that results from confronting new and novel problems; and
3. evolves decision mechanisms that reward success—and eliminate failures—arising from trial-and-error experimentation.

So, too, in the case of the individual enterprise, improving the chances of success depends on an organizational structure that:

1. creates entrepreneurs with a concern for the welfare of the overall enterprise;
2. is adaptively efficient, enabling the organization to learn, assimilate information, and adjust the organizational structure in the face of uncertainty and continuous novel change; and
3. develops incentives that reward success and mechanisms that eliminate failures that will inevitably occur—especially as a result of innovation—in a non-ergodic world.
The word transparency crops up more and more in public statements by politicians and corporate officials—as if simply saying it were enough to guarantee it. Understandably. Now more than ever, we know that keeping secrets is dangerous for organizations and the people affected by them. But no amount of incantation or legislation can make an organization transparent. That happens only when an organization creates a culture of candor, one in which followers feel free to speak truth to power and leaders are willing to hear it.

Unfortunately, while many organizations pay lip service to those values, few organizations are genuinely committed to openness and candor. Instead, when it comes to sharing secrets, most organizations hold onto inside information with obsessive zeal. And even within the family, as it were, far too many organizations have traditions and structures that keep essential information from reaching decision makers. History tells us that lack of transparency too often has tragic results. The 9/11 Commission Report is only the most recent evidence of how devastating the consequences can be when vital information does not flow freely within and between organizations.

And yet, in recent years candor and transparency seem to have all but disappeared from our organizations. Accounting fraud, insider trading, and just plain lying have destroyed one promising enterprise after another. Top executives who were once as celebrated as rock stars are now in prison or bound for it. Trillions of dollars of investor wealth vanished overnight. The restating of corporate earnings, once rare, has become commonplace, and every such announcement reinforces many people’s jaded belief that business has lied to them before and is likely to do so again.

No wonder that only 15 percent of respondents to a November 2002 CBS/New York Times poll expressed much faith in American business, and that two-thirds of those CBS canvassed at around the same time believed most corporate leaders are dishonest. It would be hard to overstate just how low the reputations of business leaders and business itself have sunk in recent years. This pervasive lack of public trust threatens the economy far more than the direction of interest rates or even the outcome of any single presidential election.
Lessons from Los Alamos

Of course, there are rare instances—national security is the most obvious—when information must be limited to a few people who are demonstrably trustworthy. And businesses have the right, even the obligation, to protect intellectual property and other assets. But even in wartime, a compelling case can often be made for prudent transparency. One of J. Robert Oppenheimer’s acts of genius as the scientific leader of the Manhattan Project was to persuade the project’s Armed Forces head, General Leslie Groves, that the atomic scientists recruited for the project should be able to speak freely among themselves, even about top-secret matters. Yes, increasing the number of people who knew that the United States was trying to build an atomic weapon increased the likelihood that the enemy would learn of the effort, Oppenheimer conceded. But he argued persuasively that the enemy could already guess that the effort was underway—after all, the names of most Allied scientists doing bomb-relevant research had vanished from the pages of the scientific journals. Groves reluctantly, and courageously, acquiesced. As a result, although the scientists’ letters left Los Alamos only after being censored, the scientists themselves could speak freely to each other as long as they were on the secret base. The scientists’ ability to share vital information helped them accomplish their goal in a remarkable two years.

In addition to speeding up the discovery process at Los Alamos, information sharing within the group had a potent morale-building effect. Physics wunderkind Richard Feynman was put in charge of a group of engineers doing tedious but essential calculations for the project. The engineers were told nothing about the nature of the bomb project or how their own work fit into it. Their performance was slow and lackluster. Then, Feynman persuaded Oppenheimer to extend the culture of candor enjoyed by the scientists to the engineers. Oppenheimer spoke openly to the engineers about the project and their critical contribution to it. The lecture was transforming. Afterwards, the engineers worked tirelessly, without prompting and without complaint. Feynman estimated that knowing the nature and importance of their work made the engineers work almost ten times as fast and with fierce commitment.

How effectively information flows through an organization is directly related to its culture. Many institutional cultures make transparency all but impossible. In an epic confessional essay in the May 2004 issue of The Atlantic Monthly, former New York Times Executive Editor Howell Raines accuses the paper of what he terms “management by mendacity.” He writes that Times publisher Arthur Sulzberger Jr. chose him for the job for the express purpose of shaking up the paper’s corporate culture, including the unacknowledged practice of letting the mediocre and unproductive remain once they were admitted to the club.

According to Raines, when Sulzberger introduced Raines’ successor, Bill Keller, to the Times staff, the publisher said: “There’s no complacency here — never has been, never will be.” But Raines insists: “I can guarantee that no one in the newsroom, including Arthur himself, believed what he said. It was a ritual incantation meant to confirm the faith of everyone present in the Times’ defining myth of effortless superiority. Arthur’s politic words were a declaration that although Times people may talk and sometimes even joke among themselves about the paper’s deeply rooted complacency, that characteristic must be vehemently denied when mentioned outside the tribal circle.”

Many of us have been in organizations that have been harmed by their defining myths. Such myths are always Janus-like: On one hand, they help create cohesion, and that spirit of being part of a grand, exclusive club often facilitates the best kind of collaboration. On the other hand, these same myths make it harder for the organization to criticize itself in any meaningful way, no matter how illuminating and useful such self-analysis would be.

Are You Working in a Toxic Caste System?

I am convinced that an essential first step in making any organization more transparent is to examine its culture. The first question to ask: Who talks to whom? In many organizations, information flows down but not up. Observers of the recent scandals at both The New York Times and USA Today claim that editors had allowed
a toxic caste system to develop. Editors interacted only with a handful of anointed reporters, whose work was dangerously exempt from the kind of critical, even cynical, scrutiny that was standard for everyone else. Both newsrooms had buzzed for months about the suspect quality of work by rogue reporters Jayson Blair and Jack Kelley that eventually embarrassed both papers.

A more egalitarian newsroom would have served both papers better. A more collegial organization would have allowed information to flow more freely. If the editors had spent more time with more people, they would not have been blindsided by dishonest reporters who ruthlessly manipulated them as well as the truth. Some critics said the editors had succumbed to the Golden Boy syndrome. In fact, what the editors had succumbed to was the all-too-human tendency to limit their interactions to a coterie of charming, ego-massaging individuals who told them only what they wanted to hear.

When leading a large organization, it is not enough to say, as so many leaders do, “My door is always open.” Employees with an ounce of emotional intelligence know not to drop in to the boss’s office on a whim. People in power have to insist that those who report to them tell the truth, however unpleasant. That isn’t as easy as it seems. Power is intimidating, and those who have it often make their own importance known in myriad ways, some explicit (bespoke suits), some not. Leaders routinely send out signals that make it clear they want to hear only confirming information. The stated policy may be: “You need to take responsibility” or “No whining.” But the real message, never voiced but understood organization-wide, is often that the only way to succeed here is to tell the leader what he or she has already decided.

It is not surprising that people at the bottom of the rarely acknowledged organizational pyramid are loathe to put their jobs—and their family’s health insurance—on the line by telling the boss his or her idea is faulty, wrong, or dangerous. What is more surprising is that the so-called “shimmer effect” that surrounds most leaders dazzles even their ostensible peers. A case in point is the alacrity with which the trustees of Hollinger International approved then-CEO Conrad Black’s $8 million purchase of a collection of Franklin Delano Roosevelt’s papers. Black wanted the documents for a Roosevelt biography he was writing. Fine. But why didn’t a single trustee question the inflated valuation of the papers, to which only the seller—hardly a disinterested party—had attested? The answer, according to The New York Times, “was not negligence [on the part of the trustees], but something more like awe.”

Great Leaders Ask Not to Be Spared

Ordinary mortals like having their egos massaged. Great leaders ask not to be spared. They want to know everything, not just the good news, because they understand that the more they know the better their decisions will be. Decision making rises and falls on the quality of information at hand. And listening isn’t easy. Active listening, intelligent listening, is a demanding task, which is why too many leaders develop what they call in the Middle East “tired ears.” Wise leaders become skeptical when what they hear simply validates their current position. Universal assent makes strong leaders nervous. When everybody in the room says, “Great idea, boss,” the authentic leader quickly asks for a second opinion.

I was fascinated to discover recently, in reading David Hackett Fischer’s Washington’s Crossing, that our first president never relied on his own gut or the counsel of his closest advisors when going into battle. Instead, he would consult widely, even asking civilians what they thought. Most remarkably, according to Fischer: “It was typical of Washington’s leadership to present a promising proposal as someone else’s idea, rather than his own. It was his way of encouraging open discussion and debate.” Still a good strategy more than 200 years later.

In order to get the information and the knowledge he or she needs, a leader must have the ego strength to say “I don’t know. What do you think?” Princely executive compensation should make that easier, but it is amazing how few CEOs are capable of that kind of modesty, despite the huge payoff that can result. You can hear how great you are from a paid subordinate or you can hear it from history. You choose.
One way to make sure that the cons as well as the pros of any strategy are probed is to listen to your contrarians. If you don’t have any, hire some immediately. That too is harder than it sounds. People like being surrounded by people who agree with them and tell them how brilliant they are. It’s human nature. But the person who is willing to look his or her boss in the eye and say “Nonsense” is worth a thousand yes men. As a leader, you already know what you think. What you need to know is what the smartest person who is least enamored of your idea sees as its weakness. That is your best hope of polishing your idea so that it really shines or, just as important, dumping the idea before it makes you look like a fool or, more important, harms the organization.

The contrarian is the one person in the organization who really earns his or her salary—and should earn the leader’s gratitude as well. Bonuses should routinely be given to employees who save their leaders from making stupid decisions. Instead, such people tend to be shunned because “they are not with the program” and are more likely to be fired than rewarded.

The fact is, our leaders need to develop thicker skins. They do our companies no service when they react to principled feedback like the princess with the pea under her royal mattress. The kind of toughness we should value in our leaders is not their rigidity but a willingness to profit from the thoughtful criticism of those brave enough to speak up, even when they may not have courtly manners. Followers need to remember that some things are worth getting fired for. That is always easier to say than to do. The courage of the follower is always more laudable than that of the leader, because the follower’s losses cut so much closer to the bone.

Rewarding Principled Dissidents

Principled dissidents should not simply be tolerated. They should be rewarded. And those who are close to the top and don’t speak out should be punished. That alone sends a powerful message to the rest of the organization that speaking truth to power is not some odd and embarrassing happening but an obligation. When we start reading in the company newsletter about individuals who have loyally revealed weaknesses in the operation, we will know that the organization is finally committed to the kind of openness it may already have boasted of in its mission statement.

The Sarbanes-Oxley Act of 2002 helped make corporate governance more transparent, but no amount of legislation will make our organizations truly transparent. Only courageous leaders, and followers who are even more courageous, can do that. As a leader, the most important action you can take is to seek out and embrace dissent. Whistle-blowers are made, not born—made by leaders with “tired ears” who prefer sycophancy to candor.

Recently, the media have reported on several employees of the FBI—one a translator of Farsi and other Middle Eastern languages, another an agent who had successfully infiltrated terrorist groups—who put their careers on the line to expose weaknesses in the bureau’s procedures. The result? One was dismissed, the other sentenced to career death. If history tells us nothing else, it tells us this: Angry individuals who know where an organization’s bodies are buried will eventually become so frustrated at being ignored, so indignant at being treated unfairly, that they will call a reporter and tell all. How brilliant does a leader have to be to realize that the wiser strategy is to hear what the potential whistle-blower has to say and correct the problem, if humanly possible? How many shuttles does NASA have to lose before it realizes that all pre-launch rumblings about potential problems should be taken seriously?

There is a great irony about the growing lack of transparency in our organizations. Even as organizations try more and more desperately to keep the lid on their secrets, information is becoming harder and harder to control. The Internet has democratized the spread of information in ways that could not have been imagined 20 years ago. Your disgruntled former employees, your angry ex-wife, all have access to computers. They can reveal your most intimate secrets to millions of people around the globe by pressing a single computer key. No matter what safeguards you think are in place, it is harder than ever to keep secrets in this wired world. Just ask the judge in the Kobe Bryant case
who recently—for the second time—had to apologize for the release of the name of the alleged rape victim by a court employee.

As a leader, what can you do to encourage a culture of candor and the greater transparency that will predictably follow? One way is to do what the Roman Catholic Church has done for centuries when vetting candidates for sainthood: Appoint a Devil’s Advocate. Choose the most persuasive person you know, or a panel of the brightest people in the organization, and ask them to shoot holes in your latest project. Insist that they research the weaknesses of the project with the same fervor they would bring to advocating it. If they succeed in demolishing your idea, reward them. People know that whistle-blowers tend to lose their jobs, and often never work again. It will take years of organizations embracing their whistle-blowers before the average person overcomes his or her understandable reluctance to speak out. Not until candor is truly reflexive will organizations be truly transparent.

Another approach is to hold so-called qualming sessions whenever an important decision is about to be made. Invite everyone who is party to the decision to some pleasant site away from the office and insist that they try to imagine every possible way the plan could fail and why. Once again, it must be made clear that no idea is unacceptable and that no one will be punished for speaking out. The rules should be those of brainstorming sessions—the more ideas, the better. There are no bad ideas, at least in the early rounds of conversation. Nobody’s head will roll for saying something an executive doesn’t want to hear. It won’t solve all your organization’s problems, but it will be a promising and potentially powerful start.

At the least, employees may feel empowered to speak up the next time they see a flaw in an idea that is about to be put into action. If such a culture of candor had been in place when decisions were being made at Enron, it might still be a name that would evoke pride.
Global Interdependence
A Sobering Reality

In thinking about the emerging relationship between the United States and the global economy, I am struck by a rather curious anomaly: The more dominant our status as a military, economic, and geopolitical superpower, the more dependent we seem to have become on the rest of the world. Global interdependence is more than a new cliché—it is a sobering reality.

Global terrorism is widely considered to be the transcendent threat to our national security. Here, too, we urgently need the continuing cooperation of the rest of the world, as we are learning—a bit reluctantly—in our sobering post-war experience in Iraq. We would also do well to remember the sage caveat of one French observer, who said that “when economics gets important enough, it becomes political,”—an idea that rings especially poignant next to Herbert Stein’s pungent remark that “if something is unsustainable, it tends to stop.”

We are now confronted with at least two such “unsustainables” that could easily unsettle the global political economy: our unprecedented current account deficits and the emerging global aging crisis.

For years, leading international economists have said that the U.S. could sustain a current account deficit of 2-3 percent of the GDP. Today, the melancholy fact is that America’s current account deficit is at record-shattering levels, about 5 percent of GDP and climbing. In the 1980s, when the U.S. experienced its previous record current account deficit, at about 3.5 percent of the GDP, the dollar fell by one-third on a trade-weighted basis and about half vis-à-vis the yen. Possible scenarios on our mindnumbing current account deficits include some potentially troublesome outcomes. These should stimulate Americans to do everything possible to manage our economy, and most particularly our deteriorating fiscal outlook, better than we are today.

Global aging—by which I mean both the explosion in both the longevity and the sheer numbers of elderly, combined with an unprecedented drop in birth rates; and the shrinking future crop of taxpaying workers in most developed countries—this is another prime candidate for unsustainability. In our pay-as-you-go, unfunded world of senior benefits, there is virtually unanimous agreement that the implied tax increases or benefit cuts or increases in debt—or all of the above—are both unsustainable and unthinkable in economic, political, or indeed moral terms. Europe’s and Japan’s predicament is even more sobering than ours.

The conventional wisdom tells us that, given the toxic politics of reforming these senior benefit programs in a timely manner, only a crisis—perhaps in our financial and
exchange rate markets—will energize a solution. But let us be clear: This has serious implications for us all, particularly in our tightly linked capital markets.

Both of these unsustainable scenarios dramatize the need for sound, courageous, and cooperative management of our domestic economies and the global economy.

Returning to my basic theme of the new urgency of global interdependence, a further comment on the U.S. role: The United States has become the engine of the world economy but even more important is seen, however grudgingly, as the example of what a 21st-century economy is likely to be. Among the mature countries in the world, the U.S. is one of very few that is generating sufficient domestic demand to absorb exports from the emerging market countries and others. It is one of very few that has demonstrated the flexibility and, in particular, the labor mobility to define and weather the rapid technological, scientific, business, and financial innovations that characterize the global economy.

It is one of very few that has developed both the capital market structure to sustain risk-taking and the institutions to reward business success and deal with business failure. As a result, productivity has grown rapidly, the standard of living has leapt ahead, and the U.S. has attracted professionals and skilled and unskilled labor from around the world. Even our mistakes, such as the extensive corporate governance scandals that emerged in 2001–2002, are studied around the world.

So, in many ways, the world seems more dependent than ever on the U.S. economy. At the same time, the U.S. economy is also more dependent than at any other time since perhaps the nineteenth century on the rest of the world economy, and thus on growth and financial stability abroad.

One reason is the simple fact of globalization, longstanding in the financial markets but now also a fact of life in the production of goods and, increasingly, services, making the national economies of mature and emerging countries increasingly more tightly linked and interdependent. A second reason is that the United States has become the world’s largest debtor: Until our yawning savings-investment gap closes, the U.S. requires an unprecedented steady and reliable inflow of savings from the rest of the world.

As a result, the U.S. also has a crucial stake in the strength and effectiveness of institutional frameworks in other countries, as well as of the international economic institutions. The Bretton Woods institutions may require reforms, but the U.S. has every interest in strengthening them, rather than allowing them to wither. Similarly, the U.S. has an important stake in seeing that the latest round of trade negotiations under the World Trade Organization comes to a successful conclusion. There is an obvious need for greater direct U.S. engagement in institutional development in individual countries as well.

Moreover, the U.S. stake in emerging market countries provides a rich agenda for the United States to engage its economic partners in the mature economies. We have a common interest in resolving the current global imbalances in a manner that continues to raise, not just maintain, the standard of living in the mature economies—an especially challenging task given the daunting demographic developments lying ahead for the world’s wealthy countries. And we have a large common interest in raising the standard of living and increasing the economic integration of the emerging market countries, since we know from the post-World War II experience that economic integration and prosperity together provide a strong bulwark against global instability and, now, terrorism.

A more visible and robust U.S. commitment to strengthening international economic architecture and performance would enhance U.S. “soft power,” arguably something just as important to its long-run national interests as its role as a military power. This would also help reduce both the generalized turbulence in the increasingly integrated and interdependent world economy and the added turbulence caused by the two current “unsustainables” I have mentioned—America’s massive current account and domestic deficits and what can safely be called the global aging crisis.
Although Total is based in Europe, that doesn’t necessarily mean we see things so very differently from our counterparts in other regions. Increasingly, multinational companies like ours face the same conditions, challenges, and opportunities wherever they operate, as globalization profoundly reshapes today’s world.

In the years leading up to September 11th, that world may have been lulled into complacency. The euphoria that greeted the fall of the Berlin Wall and the hopes raised by the Middle East peace process had created a burst of optimism that democracy and stability would spread. But the geopolitical tensions stemming from the terrorist attacks on the World Trade Center have been a wake-up call to multinationals about the ongoing risk of global terrorism. Since multinationals often work in high-risk countries, terrorism is a major concern. Many of our own teams, for instance, have to manage such risks in their day-to-day operations.

But heightened sensitivity to sustainable development and a re-examination of the legitimate role of companies in society make for a more fundamental, sweeping change that is having an even greater impact on how companies operate and expand globally. Economic, energy, environmental, and political uncertainties are fueling a preoccupation with these issues, but there is also a widely held belief that nations and government organizations cannot resolve the challenges of globalization without the support of companies.

As a result, companies are being asked to develop solutions to help alleviate fundamental problems such as global warming, inequality between industrialized and developing countries, and access to energy. The spotlight is on corporate social responsibility.

As an energy and chemical company operating in 120 countries, Total is inevitably a major player in this global process. We were pursuing sustainable development long before it attracted broad media coverage, and our core commitments include:

- reducing our environmental footprint and industrial risk;
- leveraging oil and gas resources;
- developing new energies;
- fostering equity and diversity in our labor relations and human resources; and
- integrating our operations into local communities.

Our initiatives leverage a high degree of technological know-how and innovation, and require constant management oversight. The human factor heightens this complexity, as does the diversity of situations in which we operate. This is
particularly true where social, societal, and ethical issues are concerned, which is why I will be focusing on them here.

The operations of a multinational like Total generate considerable wealth. How to use that wealth to drive local and regional development is a key societal concern for us. The question of how best to contribute to regional development is particularly sensitive in emerging countries, where our capital-intensive industrial projects can create social instability if not properly handled.

Any local or regional response must first take the full measure of the situations, cultures, and constraints involved—programs can be effective and efficient only if we clearly understand the priorities of the people concerned. Communities in non-OECD countries are more focused on health and education, for example, while those in OECD nations tend to emphasize continuous improvement in the quality of life.

Getting things right also means listening to and dialoguing with the people in neighboring communities to understand their needs. Front-line partnerships enable us to identify the right project at the right time in the right place. This is why we continue to form partnerships with NGOs that have strong local ties; and why we promote active participation by local communities. It is the best way to ensure the long-term success of the development process—even after Total leaves.

This approach to community relations is not restricted to European companies. In fact, we in Europe have probably not done as much to formalize our societal practices as our North American counterparts. At Total, we’ve been focusing on formalizing this process and promoting experiencesharing among regions and businesses for the past year or so.

In the area of human resources, we feel that corporate social responsibility means ensuring that baseline labor standards are set so that our employees are united on a level playing field within the company. Not to sound clichéd, but I think that the special emphasis on this at Total probably stems from our European sensibilities. Corporate standards are also the best way to ensure equity, one of our core values. Our salary policy, for example, aims to provide all employees across the globe with total compensation that is competitive in their market and that rewards both individual and corporate performance.

We have also created a corporate body to monitor the current insurance and retirement plans of all our companies worldwide. Our goal is to go beyond national requirements and, when necessary, offset the lack or inadequacy of government-mandated programs, thereby contributing to the financial security of employees and their families.

Our ethics-related actions and responsibilities, too, we frame within the context of more universal principles that transcend borders. Civil society is increasingly concerned with ethics and human rights—both corporate and personal—and, as responsible citizens, employees must be able to take pride in their company’s ethical record. This is a positive development for society as a whole, wherever people live or work, but ethical issues are often so complex that there is no simple answer—especially for companies like us operating in challenging environments.

At Total, our actions, standards, and practices must comply with the ethics, corporate values, and principles set out in our Code of Conduct. The Code—a benchmark for employees and people outside Total—upholds the universally recognized principles of the Universal Declaration of Human Rights and the International Labour Organization.

The cultural, political, geographic, and economic diversity that multinationals deal with every day make strict ethical principles and rules crucial—Total’s management closely tracks how our Code of Conduct is being applied in a wide variety of circumstances. These scenarios can sometimes be very challenging for the local population—political instability, lack of democracy, internal divisions, war—
and they can also place serious ethical demands on our teams, as they seek to apply our values in countries that are not democracies without imposing a cultural model perceived as alien to local principles. The Code of Conduct is a valuable aid in our ongoing efforts to strike the right balance.

But it is not enough on its own—we have to help people apply these values in their day-to-day activities. This requires practical training, advice, and oversight, which is provided by our Ethics Committee, set up in March 2001. Anticipating and preventing problems in these areas is the duty of everyone in the company.

Transparency is another key concern for the oil industry, and here our position is unambiguous: We will participate in measures that would enhance transparency, for example, within the framework of a supranational organization that would publish consolidated revenue figures with the agreement of the governments concerned. And we contributed to the Extractive Industry Transparency Initiative (EITI), endorsed by the G8 at the Evian Summit in June 2003 in the Action Plan on Fighting Corruption and Improving Transparency.

Managers and employees alike must set an example in this area. We must all take personal responsibility and conduct ourselves ethically in both our personal and professional lives. There is no room for a double standard.
Almost everywhere in Asia, economic growth has slowed down perceptibly in recent years. Japan is in its second decade of stagnation and, even with the recent optimism about recovery, expects to eke out only a modest growth in 2003. The “four little dragons” of the 1980s and early ‘90s—Singapore, Hong Kong, Taiwan, and South Korea—have not done much better since the Asia financial crisis of 1997–98.

Singapore, which was accustomed to 8 percent or higher growth every year before 1998, has had two negative growth years since then (1998 and 2001) and appears to be heading into another one this year. Hong Kong experienced –5 percent growth in 1998 and has averaged about 4 percent growth since then—lackluster compared to its record before 1998. Taiwan has gone from 6–8 percent annual growth in the decade before 1998 to an average of 3–4 percent since then. South Korea, after recovering from a 6.7 percent contraction in 1998, has performed erratically, and in fact experienced sequential quarter-to-quarter contraction in the first half of 2003. The other smaller economies in South Asia have behaved more or less similarly to the four little dragons.

The only major strong-growth economy belongs to China. There, the growth has averaged above 6 percent since 1998. What caused the slowdown in economic growth in all the countries outside China? There were perhaps many reasons, but the biggest reason may be one word: China.

For more than a decade now, China has acted as a strong magnet for manufacturing industries. China has a large available workforce of good quality; its wage levels are low compared to most of the developing nations in Asia; and its national and local governments have been very solicitous in attracting investments, technology, and talents.

After more than a decade of strong growth, China’s magnetism shows no sign of weakening. Only a small percentage of the potential workforce is tapped. As manufacturing goes inland from the coastal area and as China’s agricultural economy converts to industrial, the potential availability of an industrial workforce is almost unlimited. The wage levels are rising, but have a long way to go before they catch up even with most of the developing countries. As to the government’s efforts to attract investors and expatriate and repatriate talents, well, success feeds upon itself, and the national and local governments certainly show no sign of tiring so far.
China’s climb up the manufacturing technology ladder has been fast. In the late 1980s and early ‘90s, aside from the state-owned heavy industries, China’s manufacturing consisted of light industries using what was generally considered lower-end technology—textiles, bikes, shoes, etc. In the mid ‘90s, China got into PCs and electronic assembly. Now it is building up critical components industries, such as semiconductors.

In expanding the size, the technology, and the range of its manufacturing, China is doing what Japan and the smaller countries in East Asia did in the decades after World War II. In the process, China is, to a significant extent, out-competing other Asian countries and taking over the position that the other countries, including Japan, enjoyed in the world supply chain.

What should the other Asian countries do? Basically, the companies in the other countries have responded with a two-part solution. First, move manufacturing to China when economics requires and politics permits. This part of the solution has met with reasonable success, at least from the companies’ point of view—indeed, companies’ very success has led to slower growth for their home countries’ economies.

The second part of the solution is to create a new business model or business that will allow the company to continue to operate competitively in the home country. This new model or business might be variously described as more marketing-oriented, more knowledge-based, or higher value-added. Many companies in Asia are attempting this. Even companies in China are trying to upgrade to higher levels of value-added as they gradually capture more and more older-style manufacturing.

But to succeed in creating new business models and businesses requires lots and lots of innovations, entrepreneurship, and investments. Do the countries of Asia have the educational system and social culture to spawn the necessary innovations and entrepreneurship? Do they have the financial institutions to provide the investments? Do the governments maintain enough of a level playing field, so that small entrepreneurial companies don’t get snuffed out or gobbled up just when they begin to have a little success?

Social, cultural, and institutional challenges create their own limits to economic growth, which are quite different from the limits imposed by environmental and natural resource constraints. Faced with these challenges, constant self-renewal—as the United States seems capable of—appears to be the only way to keep lifting the economic plateau. Japan reached a high plateau in the late 1980s and has stayed there since then. Will it lift itself to a higher one? Each of the four little dragons seems to have reached its own plateau in the years after 1997–98. Will they lift themselves to higher plateaus? It’s hard to be optimistic, because societal, cultural, and institutional transformations are difficult and take a long time.

But one waits and sees.
The resurgence of the U.S. economy from 1995 to 2000 outran all but the most optimistic expectations. It is not surprising that the unusual combination of rapid growth and low inflation touched off a strenuous debate about the productivity of technology investment and whether improvements in U.S. economic performance could be sustained. This debate has intensified with the onset of recession, the collapse in technology company stock prices and, more recently, with last summer’s meltdown in the U.S. stock market. So, the question: Can the rapid productivity acceleration of the 1990s be maintained? The answer is a resounding “It depends.”

The technological underpinnings of the last decade’s remarkable economic performance should not be confused with the rapid pace of investment. The investment boom was not sustainable, since it depended on substantially more growth in the number of hours people worked than in the labor force itself. Had the breakneck pace of investment continued, the economy would eventually have exhausted the pool of available labor. This is precisely what motivated the Federal Reserve to sharply increase interest rates beginning in May 1999, ending the boom and bringing on the mild recession that began in March 2001.

The investment boom and the productivity resurgence were driven by a remarkable decline in information technology (IT) prices. The decline in IT prices followed a dramatic acceleration in the semiconductor product cycle. The pace of innovations that dramatically reduced the size of semiconductor devices opened up opportunities for technological advances in computers, communications, biosciences, and other IT-using industries. While advances in semiconductor technology have found their broadest applications in computing and communications equipment, they have also reduced the cost and improved the performance of automobiles, aircraft, scientific instruments, and a host of other products. This process is likely to continue and even intensify.

Faster, Better, Cheaper
A mantra of the “new economy”—faster, better, cheaper—captures the speed of technological change and product improvement in semiconductors. In 1965, Gordon E. Moore, then Research Director at Fairchild Semiconductor, made a prescient observation, later known as “Moore’s Law.” He observed
that each new chip contained roughly twice as many transistors as the previous chip, and was released within 18–24 months of its predecessor. This implied exponential growth of capacity, at 35–45 percent per year!

The rapidly rising capacities of microprocessors illustrate the exponential growth predicted by Moore’s Law. The first logic chip, introduced in 1971, had 2,300 transistors; the Pentium 4, released by Intel in November 2000, had 42 million! Over this 29-year period, the number of transistors increased by 34 percent per year, tracking Moore’s Law with astonishing accuracy.

Moore’s Law also captures the fact that each successive generation of semiconductors is faster and better. This relentless improvement, continuing for three decades, makes the role of information technology in the U.S. economy unique. The revolution in computing capability means that memory and logic chips have become cheaper at a truly staggering rate (see chart on page 3). The challenge for economics is to capture both the continuous improvement and the rapid pace of advance of semiconductor technology, both in price measurements and in understanding the sources of economic growth.

Prices of memory chips declined by a factor of 27,270—41 percent per year—between 1974 and 1996. Similarly, prices of logic chips available for the shorter period of 1985–96 declined by a factor of 1,938—54 percent per year. In 1994 and 1995 alone, the microprocessor price decline leapt to more than 90 percent per year as the semiconductor industry shifted from a three-year product cycle to a greatly accelerated two-year cycle. These extraordinary advances in computing power translate into tremendous potential cost reductions for downstream users. These reductions have only just begun to be realized.

Indeed, communications technology—one of the most important drivers of the technological revolution—has been undervalued because appropriate price measures have not been developed to capture the enormous gains in capability and, by implication, productivity. This technology is a crucial ingredient in the development and diffusion of the Internet, and perhaps the most striking manifestation of information technology in the U.S. economy.

Communications equipment is an important market for semiconductors, but constant performance price indexes have been developed only for switching and terminal equipment. Much communications investment, however, takes the form of the transmission gear connecting data, voice, and video terminals to switching equipment, fiber optics, microwave broadcasting, and communications satellites. Innovations in this equipment have progressed at rates that outrun even the dramatic pace of semiconductor development.

One such innovation is dense wavelength division multiplexing (DWDM), a technology that simultaneously sends multiple signals over an optical fiber. The installation of DWDM equipment, which began in 1997, has doubled the transmission capacity of fiber optic cables every 6–12 months. Yet we have no adequate price measures for capturing the value of this innovation to the economy. In other words, we are significantly underestimating the investment boom and the productivity gains from communications investment because our price measures are faulty. Indeed, had there been better measures of the true impact of these investments, the extent of overcapacity might have been recognized at a much, much earlier stage and the recent implosion in the communications sector avoided.

Software is also an increasingly important enabler in the technology space. Here again, appropriate price measures—and accurate measures of the capacity generated by these investments—are lacking. These huge gaps in our ability to measure technological change challenge our ability to understand its impact on economic growth.

Economists identify the contributions of outputs and inputs to U.S. economic growth by means of growth accounting. In a system of growth accounts for the U.S. economy, the contribution of each output is its growth rate, weighted by its share in the value of the GDP. Likewise, the contribution of each input is its weighted growth rate. When we lack adequate price
measures, we fail to accurately measure the growth rates of both outputs and inputs. The final component of a system of growth accounts is growth in total factor productivity (TFP), defined as output per unit of input, including both capital and labor inputs. Economies increase the productivity of both labor and capital by pushing out the technological frontier. Massive increases in computing power like those experienced by the U.S. economy have the potential to extend this technological frontier and drive growth in two ways.

First, as IT producers become more efficient, more IT equipment and software is produced from the same inputs. This raises productivity in IT-producing industries and contributes to TFP growth for the economy as a whole. Labor productivity also grows at both industry and aggregate levels.

Second, investment in information technology leads to growth of productive capacity in IT-using industries. Labor is working with more and better equipment, and this increases labor productivity through capital deepening. If the contributions to aggregate output are entirely captured by capital deepening, aggregate TFP growth is unaffected, since output per unit of input remains unchanged. But major technological advances can increase productivity even when capital deepening is taken into account.

Unlocking the Future With the Past
To understand the distinctive features of economic growth since 1995, we need to examine the sources of the growth of the U.S. economy for the past half-century and see how our recent experience compares. Input growth, not surprisingly, is the source of almost 82.5 percent of the 3.5 percent per year GDP growth over the last 50 years. The ability to combine labor and capital in innovative ways—TFP—accounted for only 17.5 percent of the growth during that period. In other words, the economy grew largely because we put more people to work, they worked longer hours, they were better educated, and, most significantly, they worked with more and better capital. How labor and capital are combined to achieve new ways of doing business accounts for a much smaller share of long-term growth.

Relative to the early 1990s, output growth increased by 1.7 percent in 1995–2000. The contribution of IT production almost doubled, but still accounted for only 27 percent of the increased growth of output. Almost three-quarters of that increase can be attributed to non-IT products. Both labor and capital made significant contributions to the growth surge of the late 1990s. The growth rate of labor input accelerated to 2.2 percent for 1995–2000 from 1.9 percent for 1990–95. This is primarily due to the growth of hours worked, which rose from 1.2 percent for 1990–95 to 2 percent for 1995–2000, as labor force participation increased and unemployment rates plummeted.

The growth of labor quality, defined as labor input per hour worked, declined considerably in the late 1990s, dropping from 0.7 percent for 1990–95 to 0.3 percent for 1995–2000. With exceptionally low unemployment rates, employers were forced to add workers with limited skills and experience. But using the U.S. labor force more intensively was far from the whole story.

Between 1990–95 and 1995–2000, the contribution of capital input jumped by a full percentage point, and TFP accelerated by 0.5 percent. The contribution of capital input reflects the investment boom of the late 1990s. Businesses, households, and governments poured resources into plant and equipment—especially computers, software, and communications equipment. The jump in the contribution of capital input since 1995 raised growth by nearly a full percentage point, and IT accounts for more than half this increase.

The acceleration in U.S. economic growth after 1995 and the enormous contribution of capital is unmistakable. Its relationship to information technology is now transparent. The most important contribution of IT is through faster growth of capital input, reflecting higher rates of investment. This growth in capital is due not just to the quantity of capital stock but its increasing quality, defined as capital input per unit of capital stock. Improved capital quality reflected the very rapid restructuring of capital to take advantage of the sharply accelerating decline in IT prices.
Finally, the increased ability to combine labor and capital in productive ways was a major boost to growth at the end of the 1990s. Investment and labor utilization was higher, but it was also more productive—largely because of the technology revolution. Even though TFP growth for 1995–2000 is lower than during the “golden age” of 1948–73, the U.S. economy is definitely recuperating from the anemic productivity growth of the previous two decades. The question is whether this improvement is sustainable.

What Happens Next?
Falling IT prices will continue to provide incentives for substituting IT for other productive inputs. The decline in IT prices will also serve as an indicator of ongoing productivity growth in IT-producing industries. But it would be premature to extrapolate the recent acceleration in productivity growth into the indefinite future, since this depends on the persistence of a two-year product cycle for semiconductors.

The economic forces that underlie the two-year cycle reflect intensifying competition among semiconductor producers in the United States and around the world. If this rapid rate of technological progress is to persist over the next decade, new technologies must be exploited. This is already generating a massive research and development effort that will strain the financial capacities of the semiconductor industry and its equipment suppliers.

The 2001 edition of the International Technology Roadmap for Semiconductors projects a two-year product cycle through 2005 and a three-year product cycle thereafter. This seems to be a reasonable basis for projecting the growth of the U.S. economy—a continued two-year cycle provides an upper bound for growth projections, while reversion to a three-year cycle gives a lower bound.

The key assumption for intermediate-term projections of a decade or so into the future is that output and capital stock grow at the same rate. So the growth of output is the sum of the growth rates of hours worked and labor quality, plus the contributions of capital quality growth and TFP growth. A projection of U.S. economic growth depends on the outlook for each of these four components.
benefits of the future development and diffusion of IT, we must give close attention to the uncertainties that surround this development. Highest priority must be given to a better understanding of markets for semiconductors and, especially, to the determinants of the product cycle. Improved data on the prices of telecommunications and software are essential for understanding the links between semiconductor technology and the growth of the U.S economy.

The semiconductor and IT industries are global in their scope, with an elaborate international division of labor. This poses important questions about the U.S. growth resurgence. We lack evidence on IT’s impact on other leading industrialized countries, and we do not fully understand the future roles of important IT participants such as Korea, Malaysia, Singapore, and Taiwan—all “newly industrializing” economies. Moreover, what will be IT’s economic impact on developing countries like China and India?

Information technology is altering product markets and business organizations, as attested to by the huge and rapidly growing business literature, but a fully satisfactory model of the semiconductor industry has yet to be developed. Such a model would have to derive the demand for semiconductors from investment in IT, and determine the product cycle for successive generations of new semiconductors.

As policy makers attempt to fill the widening gaps between the information required for sound policy and the available data, the traditional division of labor between statistical agencies and policymaking bodies is breaking down. The Federal Reserve has recently undertaken a major research program on constant performance IT price indexes. In the meantime, monetary policy makers must set policies without accurate measures of price change. Likewise, fiscal policy makers confront ongoing revisions of growth projections that drastically affect the outlook for future tax revenues and government spending.

The unanticipated U.S. growth revival of the 1990s has considerable potential for altering economic perspectives. In fact, a steady stream of excellent books on the economics of information technology already foreshadows this. Economists are the fortunate beneficiaries of a new agenda for research that could refresh their thinking and revitalize their discipline. Their insights will be essential to reshaping economic policy so that everyone can take advantage of the opportunities that lie ahead.
Virtually everything our modern culture believes about the type of leadership required to transform our institutions is wrong. It is also dangerous. There is perhaps no more corrosive trend to the health of our organizations than the rise of the celebrity CEO, the rockstar leader whose deepest ambition is first and foremost self-centric.

In 1996, my research team and I began to wrestle with a simple question: Can a good company become a great company, and if so, how? If we could find organizations that had made the leap from good to great and isolate the factors that distinguished these examples from carefully selected comparison companies that failed to make the leap (or if they did, failed to sustain it), we would shed light on the key variables that separate great from good. We embarked on a five-year study to answer this one deceptively simple question, examining merely good performers that had somehow transformed themselves to achieve truly great results. (We defined “great results” as cumulative stock returns at least 3.0 times better than the general stock market over fifteen years, a performance superior to most widely admired companies. For perspective, General Electric from 1985 to 2000 beat the market by only 2.8 to 1.)

We uncovered a number of key requirements and underlying variables for turning a good company into a great one. But perhaps the most intriguing—and certainly the most surprising—is the type of leadership that turns good into great.

Consider Darwin E. Smith. In 1971, this seemingly ordinary man became chief executive of Kimberly-Clark. He inherited a company that for one hundred years had been merely good, never great. A mediocre player in the middling paper industry, Kimberly-Clark returns to investors had fallen 36 percent behind the general stock market over the twenty years prior to Darwin Smith’s ascension to CEO. Over the next twenty years, Smith led a stunning turnaround, generating returns to investors that beat the general stock market by over four times, easily outperforming such companies as Hewlett-Packard, General Electric, and Coca-Cola.

Have you ever heard of Darwin Smith? Despite being one of the greatest CEOs of the twentieth century, he remains largely unknown. A shy and reserved man, Smith shunned any attempt to shine the spotlight on him, preferring instead to direct attention to the company and its people. He showed none of the swagger that characterizes many of today’s high-profile CEOs, and he never viewed himself as a great hero. Early in Smith’s tenure as CEO, a director pulled Smith aside to remind him that he lacked some of the
qualifications for the position (he had been corporate counsel and had never run a major division). Smith, a man who never entirely erased his own self-doubts, later summed up his tenure by saying simply, “I never stopped trying to become qualified for the job.”

Yet despite his shy and self-effacing nature, Smith was anything but weak. When it came time to make the big decisions required to make the company great, he made them. Early in his tenure, he unflinchingly decided to sell all the traditional paper mills, which accounted for the majority of Kimberly-Clark's business—sell even the namesake mill in Kimberly, Wisconsin—and throw all the money into the consumer business, investing in brands like Huggies and Kleenex. It was a huge and painful step. Coming home from work during this particularly difficult period, a wearied Smith said to his wife, “It's really tough. But if you have a cancer in your arm, then you've got to have the guts to cut off your arm.”

Wall Street derided him, the business media called the move stupid, and the analysts wrote merciless commentary. After all, how on earth could such a mediocre paper company take on the giants of the consumer business? But in the end, Smith's stoic resolve paid off: Kimberly-Clark became the number one paper-based consumer products company in the world, eventually beating Procter & Gamble in six of eight product categories and owning outright its previous main competitor, Scott Paper. I think we can safely say that Darwin Smith did indeed become qualified for the job.

Level 5 Leadership: The Antithesis of Egocentric Celebrity

If you want to grasp the essence of the type of leader who turns good into great, just keep in mind Darwin Smith. It turns out that every good-to-great company in our study had a leader from the Darwin Smith school of management at the helm during the pivotal years.

We eventually came to call these remarkable people “Level 5 leaders.” The term “Level 5” refers to a five-level hierarchy: Level 1 relates to individual capability, Level 2 to team skills, Level 3 to managerial competence, and Level 4 to leadership as traditionally conceived. Level 5 leaders possess the skills of Levels 1-4, but also have an “extra dimension”: a paradoxical blend of personal humility (“I never stopped trying to become qualified for the job”) and professional will (“sell the mills”). They are somewhat self-effacing individuals who deflect adulation, yet who have an almost stoic resolve to do absolutely whatever it takes to make the company great, channeling their ego needs away from themselves and into the larger goal of building a great company. It's not that Level 5 leaders have no ego or self-interest. Indeed, they are incredibly ambitious—but their ambition is first and foremost for the institution and its greatness, not for themselves.

David Maxwell, the good-to-great CEO at Fannie Mae in the 1980s and early 1990s, was another such leader. He took over a bureaucratic, quasi-governmental entity losing $1 million every single business day and turned it into one of the smartest, best-run financial institutions in the world, earning $4 million every business day. Fannie Mae cumulative stock returns beat the general stock market by nearly four times under Maxwell, and he set the stage for the next generation to continue the momentum, eventually out-performing the market by over seven times.

When his nearly $20 million retirement package became a point of controversy in Congress (Fannie Mae is subject to congressional oversight due to its government charter), Maxwell became concerned that the controversy might damage the company's future. So he instructed his successor to not pay him the remaining third of his package and to donate it instead to the Fannie Mae foundation for low-income housing.

Like all Level 5 leaders, Maxwell wanted to see the company become even more successful in the next generation than in his own. Preferring to be clock builders rather than time tellers, Level 5 leaders are comfortable with the idea that their companies will tick on without them, reaching even greater heights due to the foundations they laid down. The fact that most people will not know that the roots of that success trace back to them is not an overriding concern. As one Level 5 leader put it, “I want to look out from my porch at one of the great companies of the world and be able to say, 'I used to work there.'”
It is not surprising, then, that some of the greatest CEOs of the last forty years—those few extraordinary executives who led companies from good to great (using our tough benchmarks)—are relatively unknown. In addition to Darwin Smith and David Maxwell, they include such obscure figures as George Cain, Alan Wurtzel, Colman Mockler, Lyle Everingham, Fred Allen, Joe Cullman, Carl Reichardt, and Charles Walgreen III. These and other leaders in our study quietly went about building greatness step by step, without much fanfare or hoopla, while generating results that are extraordinary by any standard. If you had had an opportunity to invest in each of the good-to-great companies at the point of upward inflection created by these leaders and held your investments to 2000, your total returns would have exceeded those of a comparable investment in a mutual fund of the general stock market by well over eight times. Yet despite these remarkable results, almost no one has ever remarked about these leaders. The media paid scant attention, and you’ll find very few articles ever written about them.

In contrast, the comparison leaders in our study—people like Al Dunlap of Scott Paper (the comparison company to Kimberly-Clark), Lee Iacocca of Chrysler (a company that failed to make a sustained shift from good to great), and Stanley Gault of Rubbermaid (a company that imploded after Gault departed)—garnered vastly more attention. Some of the comparison CEOs became wealthy celebrities—covers of magazines, best-selling autobiographies, massive compensation packages—despite the fact that their long-term results failed to measure up to the quiet, unknown Level 5s. In over two-thirds of the comparison companies, we noted the presence of a gargantuan personal ego that contributed to the demise or continued mediocrity of the company. These leaders were ambitious for themselves—and they succeeded admirably in this dimension—but they failed utterly in the task of creating an enduring great company.

Looking for Level 5 Leaders
The implications are obvious. Boards of directors and executives planning for succession would do well to search for the type of leadership—Level 5 leadership—correlated with the best and most enduring results. To do otherwise is to sacrifice long-term effectiveness for short-term expedience, which is tantamount to an act of irresponsibility on behalf of a company’s constituents, including its shareholders. To be clear, Level 5 leadership is not the only requirement for taking a company from good to great and for sustaining greatness once it is attained, but it does appear to be essential.

So, how should we go about identifying Level 5 leaders?
The key step is to stop looking for outsized personalities and egocentric celebrities, and instead to scrutinize for results. Look inside for some part of the organization where extraordinary results have been produced, but where there is no person standing forth to take excessive credit for those results. Look there and you will likely find a Level 5 leader. And if you feel you must look to the outside (which the good-to-great companies almost never did), then look for people who show the traits above.

I used to think of these leaders as rare birds, almost freaks of nature. But then a funny thing happened after a seminar where I shared the Level 5 finding and bemoaned the lack of Level 5 leaders. After the session, a number of people stopped by to give examples of Level 5 leaders they’d observed or worked with. Then again, at another seminar, the same thing happened. Then again, at a third seminar—and a pattern began to emerge.

It turns out that many people have experienced Level 5 leadership somewhere in their development—a Level 5 sports coach, a Level 5 platoon commander, a Level 5 boss, a Level 5 entrepreneur, a Level 5 CEO. There is a common refrain: “I couldn’t understand or put my finger on what made him so effective, but now I understand: he was a Level 5.” People began to clip articles and send e-mails with examples of people they think of as Level 5 leaders, past or present: Orin Smith of Starbucks Coffee, Joe Torre of the New York Yankees, Kristine McDivitt of Patagonia, John Whitehead of Goldman Sachs, Frances Hesselbein of The Drucker Foundation, Jack Brennan of Vanguard, John Morgridge of Cisco Systems, former Secretary of State George Shultz, and so on. My list of Level 5 leaders began to grow exponentially.

Then it dawned on me—our problem is not a shortage of Level 5 leaders. They exist all
around us. Like the drawing of two faces that transforms itself into a vase depending on how you look at the picture, Level 5 leadership jumps out at us as soon as we change how we look at the world and alter our assumptions about how it best works.

No, our problem lies in the fact that our culture has fallen in love with the idea of the celebrity CEO.

Charismatic egotists who swoop in to save companies grace the covers of major magazines because they are much more interesting to read and write about than people like Darwin Smith and David Maxwell. This fuels the mistaken belief held by many directors that a high-profile, larger-than-life leader is required to make a company great. We keep putting people into positions of power who lack the inclination to become Level 5 leaders, and that is one key reason why so few companies ever make a sustained and verifiable shift from good to great.

The fact that our culture has evolved away from Level 5 leadership, however, does not mean that the culture is right or that we should accept it. After all, our culture in the 1990s also embraced the idea of irrational exuberance and infused people with the idea that they could—indeed should—get rich quick by creating companies that were Built to Flip rather than Built to Last. The culture was neither right nor healthy, and we would have done better to reject that culture and hold to fundamental tenets of creation and value that we knew in our guts to be eternally true. The same holds for our current misguided confusion of celebrity and leadership—it is neither right nor healthy. If we allow the celebrity rock-star model of leadership to triumph, we will see the decline of corporations and institutions of all types. The twentieth century was a century of greatness, but we face the very real prospect that the next century will see very few enduring great institutions. If good is the enemy of great—and I believe it is—the current trends in leadership give the decided edge to the enemy.

Yet I remain optimistic. For one thing, I sense an increasing societal unease with the emergence of celebrity leaders who care more about themselves than they do about the institutions for which they are responsible. Smart people instinctively understand the dangers of entrusting our future to self-serving leaders who use our institutions—whether in the corporate or social sectors—to advance their own interests. For another, we now have hard empirical evidence that shows such leaders to be negatively correlated with sustained great results, and this evidence should bolster courageous boards of directors. Finally, and perhaps most important, I am absolutely convinced that the seed of Level 5 leadership is widely dispersed throughout society. It can be identified. It can be cultivated. It can be developed. Given encouragement and the right tools, it can flourish. And if it does, so will our institutions.
Almost three decades ago, the United States made the dramatic decision to cut the link between the dollar and gold. That action led to the end of the fixed-exchange-rate/par-value system for setting exchange rates established after World War II.

As a result, major financial powers permit their currencies to float more or less freely, one against the other. Smaller countries have been left to determine their own approach: whether to float their currency, fix its value against another currency or choose something in between.

Some initially viewed this as a desperation move—a “non-system” in response to a breakdown in international cooperation. More generally, observers see it as an inevitable corollary to the desire for national monetary autonomy in a world where international capital flows and money mobility have reached unprecedented size and fluidity.

Since the Bretton Woods system broke down, floating has been strongly supported by theoretical models—models perhaps most eloquently expounded by Nobel laureate Milton Friedman. Those models are still the standard fare of academic teaching. The theoretical construct is appealing. Responding to the decisions of innumerable independent market participants, exchange rates will respond in an orderly and predictable way to differences in national inflation and interest rates, changes in economic structure, unanticipated shocks, or other events. Abrupt exchange rate adjustments, typically made under strong speculative pressure as “par values” became untenable, would be a thing of the past. Instead, “stabilizing” speculation would maintain market continuity. Necessary adjustments to new economic and policy conditions would be relatively painless, conducive to maintaining high levels of international trade and investment. The point was strongly pressed that a floating exchange rate regime, while technically “flexible,” would in practice provide a greater degree of stability.

The large and disturbing fluctuations in actual exchange rates in the early years of floating could, in that view, be dismissed as a learning period in a particularly disturbed setting. The 1970s were marked by high and widely varying rates of inflation, successive oil crises, economic instability, and consequent uncertainty—all fertile ground for exchange rate turbulence.

Now, 30 years later, ample evidence demonstrates that the orderly adjustment process promised by the theoretical model is not reflected in the real world. Instead of moving gradually in response to different trends in inflation and interest rates, exchange rates have been subject to huge swings over the course of a year or two—shifting 50 percent and more between the dollar and the yen—on a recurring basis. This remained true long after price levels in both countries stabilized and during...
periods when economic conditions and interest rates had not changed radically in either country.

Contrary to most expectations, the newly created euro declined by more than 25 percent against the dollar in 18 months. That is a far larger change than any that occurred during the Bretton Woods period. The change lacks really convincing ex-post rationales, and those offered are not mutually consistent.

The European Union, the United States and Japan have huge, diversified economies closely competitive over a broad range of industries, each operating close to price stability. Open markets for money and capital provide ample opportunity and resources for stabilizing speculation. Yet, over periods of several years—long enough to be highly significant for investment and trading decisions—the relative prices of their goods and services have experienced extremely wide swings, up and down, as a result of exchange rate variations. The exchange market appears to be increasingly dominated by financial flows responding to strong herd behavior, amplifying and exaggerating exchange rate volatility. The evidence is clear: effective patterns of stabilizing speculation that would keep exchange rates reasonably close to a competitive equilibrium have been absent.

The fact is, in the face of wide swings in market exchange rates, any sense of a sustainable market equilibrium by either governments or market participants has essentially disappeared, contradicting the preconditions upon which the theoretical model depends. Instead, the trading instinct is “to follow the trend.” Few are prepared to take strong positions against that trend until the change is extreme.

One result has been to amplify swings in trade and current account balances among the three large economies, with deficits and surpluses substantially larger than would be expected as a result of changes in rates of economic growth or inflation. At times, those changes in trade flows may coincide with, or reinforce, the immediate objectives of national stabilization policies. For instance, the unprecedented American trade deficits of recent years and the related Japanese and European surpluses have helped damp inflationary pressures in the United States and supported needed growth elsewhere. But there is also a substantial risk that the inevitable need to reverse (or at least narrow) those imbalances, accompanied by a sudden reversal in exchange markets, could greatly complicate economic management at a later time. These major centers of economic activity, broadly diversified and self-sufficient, are relatively less exposed to international trade. Rightly or wrongly, countries judge even extreme exchange rate instability to be less costly to their economies than any action they might need to take to dampen down exchange rate fluctuations. The United States’ leading partners long accused it of “benign neglect” in the face of exchange rate instability. These days, the United States has plainly been joined in that practice by its two large trading partners.

Such policy insouciance isn’t really an option for much smaller economies that depend more heavily, relatively speaking, on international trade and are now exposed to the full force of global financial markets. Even nations so well developed economically as those of continental Europe have long been sensitive to the risk of large and abrupt exchange rate changes among themselves. They feared, correctly in my view, that so much instability would undermine the cohesion and objectives of their common market. After a long period of debate, part-way measures and planning, they have now dealt with that threat in the most definitive way possible: by abolishing their national currencies and adopting the euro as a common currency.

Much more difficult are the circumstances of smaller, emerging economies that lack the political cohesion, the economic strength, and the relative self-sufficiency of the European Union. Typically, they do not have long-established records of domestic political or price stability that would anchor expectations. Nor do they have deep, diversified, and resilient domestic markets. Even if well-managed, their financial institutions are typically too small to absorb and diffuse volatile flows of international capital and related exchange rate shocks.

On the contrary, the repeated lesson of experience is that exchange rate crises will amplify domestic economic and financial weakness, and vice versa.
The chorus of voices, official and non-official, warning that weak attempts to fix an exchange rate are not sustainable in a world of open financial markets, is certainly correct. But the further advice to solve the problems with a floating exchange rate is not, for most of those emerging economies, convincing. Experience amply demonstrates their financial and economic vulnerability to sharp exchange rate changes. The instinctive tendency has been to seek an anchor by somehow linking their domestic currency to the dollar, to the currency of a major trading partner, or to a basket of international currencies.

At the extreme, we now see some countries fixing their currencies in a decisive way by means of a currency board, or by adopting the U.S. dollar and potentially the euro. That approach can hardly be satisfactory for a country with strongly diversified trading patterns if the currencies of their trading partners are themselves volatile. That has clearly been the case for Southeast Asian countries with their trade divided among Japan, the United States and Europe. In fact, the wide swings between the dollar and the yen were undoubtedly a precipitating factor in the Thai exchange crisis that set off the much deeper and broader economic debacle among emerging Asian nations a few years ago.

In light of all these concerns, the obvious question is why so little thinking and so little effort have gone into developing more satisfactory exchange rate arrangements. One important reason is widespread and deeply held concern among policy-makers that policies to deal with exchange rate volatility would at times—perhaps much of the time—be inconsistent with appropriate “domestic” policies. Surely, such “dilemma cases” can and will arise. But my own sense is that the concern is greatly exaggerated.

As suggested earlier, the issue has been less pressing for continental-sized and broadly diversified economies. They are better able to absorb the impact of exchange rate changes without economic or financial distress. Moreover, it is not irrelevant that many large “players” in financial markets look upon exchange rate volatility less as a threat than as an important source of trading and speculative profits. After all, sophisticated financial institutions closely in touch with markets virtually minute-by-minute are comparatively well positioned to anticipate and profit from exchange rate fluctuations. Volatile markets also provide other profitable opportunities to sell their commercial customers vehicles for hedging their risk.

However, even for financial firms, exchange rate volatility is an important business risk, and it would be surprising if such volatility does not have important adverse consequences for more and more industrial and commercial firms heavily involved in international trade and investment. The swings in exchange rates we have been experiencing carry implications for those firms’ marketing, pricing and investment decisions. The impact would appear to dwarf the influence of tariffs that have long been the focus of so much international negotiation.

Whatever that logic suggests, these effects, if in fact important, have not been clearly and consistently articulated. Other problems may be more pressing and more amenable to correction by public policy.

Efforts by econometricians to pin down and quantify the impact of exchange rate volatility on economic efficiency and the allocation of capital have not been convincing and are often contradictory. Perhaps in this area, even more than in many others, the necessary diagnostic methodology to “hold all else equal” is fraught with difficulty. Or perhaps there has simply not been enough experience over time to provide the number of observations necessary for persuasive results.

That is one reason why I look forward to a new survey The Conference Board is launching in cooperation with the Group of 30 and others. The object is simple: to obtain a better sense of the impact of volatile exchange rates on business decision-making and ultimately on business efficiency, by directly questioning a broad cross-section of businesses around the world.

This is an effort for which The Conference Board is particularly—even uniquely—suited. It has a well-deserved reputation for independent analysis of business behavior. It has close contacts with, and the confidence of, business firms here and abroad. It has also demonstrated competence in conducting surveys of opinion.
The project has attracted strong leadership. Professor Marina Whitman of the University of Michigan, a member of the Group of 30, is serving as project chair. She brings to the effort a unique combination of academic standing and objectivity with highly relevant business and public service experience. A distinguished advisory panel will further assure both objectivity and relevance.

While I cannot forecast the outcome and conclusions, the work should certainly contribute to better informed discussion of exchange rate issues among international business executives and policy officials. My hope is that this study will lend impetus to a long-overdue effort to consider practical means of restoring greater stability to the exchange rate system.

There is general recognition of the strong—I think irresistible—technological and ideological forces pushing toward globalization of the world economy. The relative insulation of the United States from external influence is plainly diminishing. What has not been, in my mind, so generally recognized is the logical currency counterpart. Changes are taking place, piecemeal and without recognition of the larger implications. The creation of the euro is the most striking manifestation, eliminating in one fell swoop 11 currencies. More than a half dozen nations have ruled out devaluation by effectively adopting the U.S. dollar or the euro. In effect, their deep-seated urge for exchange rate stability and for financial stability generally has outweighed the benefit of maintaining national monetary autonomy—an autonomy that is becoming increasingly illusionary for them in a world of global finance.

Even countries as large as Mexico and Canada are debating the merits of adopting the U.S. dollar, given their already strong economic relations with this country. Those significant but sporadic initiatives fall far short of well-considered international reform. By their nature, they will not resolve the volatility among the major currencies. The tendency for currencies to drift into regional currency areas—each strong, diversified, and relatively self-sufficient—may well be consistent with even greater volatility between those areas, as the inattention to the euro/dollar rate suggests. The potential exists for nations to drift apart politically, as well as experience economic friction.

These regional arrangements are an entirely unsatisfactory “half-way house” for many nations in Asia and elsewhere. Trading patterns, culture, and history do not suggest a natural regional “anchor” for their currency.

How much better if—alongside our broadly successful collective efforts to free trade, to open financial markets, to reach common understanding on financial regulation and accounting standards—we could find ways to reduce the endemic instability of currencies.

I happen to believe that the ultimate logic of economic globalization is a stable and common unit of account and an internationally accepted means of payment—in other words, a common world currency.

That vision is not for my lifetime. But I am convinced we can do better—that we can collectively manage to reconcile national economic policies and objectives with greater exchange rate stability. I know that conviction is challenged; the conventional view is that it is a mere chimera—an impossible dream.

What cannot reasonably be challenged, it seems to me, is that the time has come for a fresh look at the exchange rate system, a look with open minds, minds sensitive to the experience of repetitive crises and to the implications of truly global markets. The risks for economic development are too great to forgo the effort.
Everybody knows that we are engulfed by the biggest merger boom in history and one that is totally unprecedented. But this simply is not true. There have been many earlier merger booms and some exceeded anything happening today, both in volume and in importance. But there is no “merger boom” today. There is a “merger and de-merger boom”—spin-offs, divestments, sell-offs, and businesses splitting themselves into several separate and independent companies. And these “de-mergers” equal in total dollar volume the mergers that dominate the front pages, and may even exceed them.

Today’s mergers and acquisitions, and especially the ones that make the headlines, are qualitatively different from those of past merger waves. The majority of today’s mergers are defensive; the majority of yesterday’s were offensive. The truly important developments in corporate and economic structure today are not the mergers and de-mergers. They are, largely unnoticed or at least unreported, new and different ways of corporate structure, corporate growth, and corporate strategy.

The biggest and most important merger boom in U.S. history was surely that of a century ago. Between 1885 and 1910 it created the great majority of the big businesses that then dominated the U.S. economy until 1960 or 1970: Rockefeller’s Standard Oil and its progeny; General Motors; General Electric; AT&T; US Steel; US Rubber; International Harvester; and all the “Trusts” that so frightened our great-grandparents. This was equally true of the other developed countries of the time (i.e., of Europe), such as Germany’s Siemens. Of the U.S. companies that meant “Big Business” in the first half of this century, and for 20 years beyond, only three—Ford, Sears Roebuck, and DuPont—were not the result of repeated mergers and acquisitions. Today, there are plenty of mergers and acquisitions in the new “Information Industries.” But none of the companies that emerged as the dominant leaders in the “Information Revolution”—IBM and Xerox in its first phase, Intel and Microsoft in its second—were created by mergers and acquisitions or engaged in either.

Quite a few other “merger booms” occurred in both the United States and Europe during these past hundred years. Consolidation of many small companies created the larger electric utilities that existed in the United States at the end of the 1920s. In Europe, mergers created Unilever, the two German super-giants, IG

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Farben and the Steel Union (both dissolved after World War II by the victorious Allies), and IG Farben's counterpart in the United Kingdom, Imperial Chemical Industries. Mergers also reduced the number of major commercial banks in the United Kingdom from about 15 at the time of World War I to 5 in 1930, and, in Germany, from 12 in 1913 to 3 by 1933.

These merger booms did indeed result in increased economic concentration. But today's de-merger boom constantly reduces concentration. For every “mega-merger” or big acquisition there is at least one—and usually several—spin-offs, divestments, sell-offs to middle-sized or small companies, or the voluntary split-up of a big company into several new and independent businesses.

For example, on June 3, 1999, The Wall Street Journal reported one big merger and five de-mergers. The two largest steel companies in the United Kingdom and the Netherlands were merging to create the world's third-largest steel company with sales of $16 billion. But the same issue of The Wall Street Journal reported that Hewlett-Packard was spinning off its $8 billion business in test and measuring instruments, Procter & Gamble was selling its adult-incontinence business to a mid-sized company, and the Harris Co. was selling its entire semi-conductor business to a small company. It also reported that Japan's giant Hitachi was selling a very large division making semi-conductor masks to a mid-sized company, while Australia's giant Broken Hill Proprietary was selling its African platinum mine to a small company. These five de-mergers together probably equaled in sales volume the day's one mega-merger. And June 3, 1999 was by no means atypical; pretty much the same merger/de-merger story is being reported every day in the business press.

De-merging began in 1981, when Jack Welch, upon becoming General Electric's CEO, announced that GE would sell off whichever of its businesses could not become either number one or number two worldwide. Nothing like this had ever happened before. But for almost two decades now, de-merging rather than merging has been the development that has most thoroughly changed the world's—and especially the United States's—industrial landscape.

De-merging typically makes business both more focused and stronger, but in many cases, also smaller in size. For instance, since 1987, Imperial Chemical, the United Kingdom's chemical giant, has spun off or sold six big businesses (about half of its total) to concentrate on specialty chemicals. The net result of the restructuring may, therefore, well be substantial de-concentration in the overall economy. What is going on, in other words, is not a merger boom. It is massive restructuring.

One reason behind both today's mergers and de-mergers is the realization that economic diversification is increasingly a handicap in the world economy. Being in the world economy means operating in geographic diversification—and then to be successful, a business must focus economically and concentrate on a few areas which it truly knows and in which it has core strengths. This does not apply only to multinationals that operate in several countries. Every business is in the world economy today, even if it does not make, buy, or sell outside a regional or national market. The world economy is where every business's competition comes from. Therefore, it is the world economy in which every business has to be able to compete.

Another reason is the steady shift from buying from suppliers to outsourcing major parts of the productive process. Automobile companies traditionally bought individual parts and accessories from separate suppliers—usually for one year only. Now, increasingly, they contract with one supplier to provide an entire part of the automobile (e.g., the entire front end or the dashboard with all its electronics) and for the entire life of a model. This then forces parts suppliers to merge. One example is the recent mega-merger of British American Lucas/Varity with TRW into the world's fourth-largest producer of automotive parts. The same development is happening in the aircraft industry and in appliance manufacturing. But this shift to outsourcing whole parts of the process also underlies a large number of de-mergers. It explains, for instance, why another very large parts
manufacturer, Rockwell, liquidated itself, selling off individual divisions to other parts manufacturers.

Outsourcing—in which an organization contracts out to an independent company parts of its operations, such as maintenance, managing the company’s computers and information systems, purchasing all but a few key supplies, hiring and training people, setting up and running the accounting system—is probably the fastest-growing of the structural de-mergers. No one knows how big outsourcing has become. But virtually no big company today—and not too many small ones—has not outsourced major operations which, only a few years ago, were done in-house. In nine large manufacturing companies I personally know and work with, up to 30 percent of all operating expenses are now fees to outsourcing contractors. These outsourcing contracts sharply decrease economic concentration. Yet there are no figures and no reports, even though the total of outsourcing contracts may well exceed the total of mergers and acquisitions.

Yesterday’s mergers were offensive. They aimed at creating growth and wealth. The majority of today’s mergers are defensive. They aim at preserving wealth, if not primarily at slowing down decline and shrinking. A majority of big mergers in the past 10 or 12 years have occurred in industries whose share of GDP or of the consumer’s disposable income has not been growing for many years. This means they are highly vulnerable and on the verge of becoming declining industries. Even if their absolute sales still go up, they are losing ground. This is the case in the automobile industry, the steel industry, commercial banking, and investment banking. In its share of GDP, the pharmaceutical industry—an industry with numerous mega-mergers—is still growing. But its costs, and especially the all-important cost of creating a highly profitable breakthrough drug, are going up almost exponentially while its prices are coming under increasing governmental pressure from deeply troubled health services all over the world. Underlying the frantic megamergers in telecommunications is the fact that the traditional telephone business now has at least one telephone. The telephone companies, therefore, whether the Baby Bells in the United States or the now privatizing national telephone monopolies in Europe and Japan, try frantically either to merge with one another or to buy their way into new and growing non-telephone telecommunications.

In fast-growing industries the key to rapid growth, especially in earnings, is a jump in market share. This is what the mega-mergers of the “Robber Barons” aimed at, as was fully understood by Rockefeller, Carnegie, J.P. Morgan, or by that least known of the “merger masters,” William Durant, who built General Motors out of two dozen mergers between 1908 and 1920. Cutting costs is the way to stave off or at least slow decline in a shrinking or endangered industry. The easiest way to do this, at least temporarily, is to spread the overhead over a bigger base. And this is what so many of today’s mega-mergers attempt to do. Whether this works, except for over a short period, remains to be seen. The stock market reaction would indicate that only de-mergers are seen as producing wealth and growth. When a company announces a de-merger, its stock usually goes up. This rarely occurs when a company announces a big acquisition or a mega-merger.

The real news, however, is that neither mergers nor de-mergers—that is, changes in ownership and control—are still the main way to create growth and wealth. Almost unnoticed by the public, and almost totally ignored by the business press and financial analysts, is that the real boom has been in alliances of all kinds, such as partnerships, a big business buying a minority stake in a small one, cooperative agreements in research or in marketing, joint ventures, and, often, “handshake agreements” with few formal and legally binding contracts behind them. It is the way, for instance, in which the pharmaceutical industry has, in the main, moved into new technologies such as genetics. In the past, a big, established company would have moved into such a new area by starting its own development or, more often, by acquiring a company in the new area.

Now the way is typically an agreement that does not give the big company control, such as the numerous agreements that
pharmaceutical companies all over the world have made with the science departments of U.S. universities.

Equally typical of the new ways of growth and expansion, but unimaginable at any earlier age, is the recent (June 1999) seven-year pact—worth $8 billion—between IBM and Taiwan’s Acer. Under the agreement, each firm will supply crucial PC parts to the other. Yet, Acer is not only a major supplier to IBM (actually manufacturing IBM’s low-priced PCs, which are then sold under the IBM label). Its own PCs, for which IBM will now make key components, are also serious competitors on the world market to IBM’s own products.

Many more of these alliances defy any traditional definition, whether financial or legal. What, for instance, is the alliance concluded late in 1995 between Intel and Sony—an alliance reportedly entered into without even a signed contract? Intel will design a new PC exclusively for Sony and will manufacture its main electronic parts. Sony will assemble and market the PC in the U.S. market, in head-on competition with Intel’s major customers. There is no financial investment by Intel in Sony or by Sony in Intel. And each firm pays its own costs. What Sony gets is access to Intel’s design capacity. What Intel gets is a guaranteed and exclusive customer for its new microchips. This surely fits neither the traditional joint venture nor the traditional “know-how” agreement. What is it then, legally or financially? There seem to be quite a few similar agreements around—in medical appliances, for instance. And outsourcing is also, economically, an alliance or a partnership.

These new relationships do not need to be reported to the SEC or to any governmental body. They do not publish any figures. They do not, as a rule, involve substantial investment and they need not even be disclosed as a footnote in the auditor’s report. To be sure, they usually require some sort of a contract. Legally, this contract looks no different from any other contract for supplies, or for services. Economically, however, it is a partnership meant to be long-lived and entailing working together. The number of such alliances is surely very large—much larger than the number of mergers and acquisitions. One U.S. company—Corning Glass—is said to have more than 1,000 such alliances and partnerships. So has one Japanese company, Toshiba. And the number is growing fast. One mid-sized high-engineering firm had 16 such alliances in 1990. By the middle of 1999, the number had grown to 185—not counting outsourcing deals in five or six areas.

The driving force behind this shift to partnerships and alliances is not money. Big established companies would have little difficulty raising the money needed for either their own development or outright acquisitions. The reason is a change in the conceptual model. In the past it was universally believed that one management model would serve every kind of business. No one expressed this belief more strongly than Harold Geneen, who built a giant company out of acquisitions in the 1960s and 1970s. He acquired 350 companies in the most diverse industries. He was convinced that he could manage all of them and make them all grow by imposing on them the same financial controls and methods. His ITT was the darling of the stock market as long as Geneen ran it. But it began to collapse almost immediately when Geneen retired in 1977.

Today, increasingly, we have come to accept that while principles of management are universal, their application and execution are profoundly influenced, perhaps determined, by the different technology, the different markets, the different cultures of an individual operation, and, above all, by a company’s theory of its business. We are applying this new paradigm even where there is ownership control. For example, in early summer 1999, the Swiss pharmaceutical giant Roche (formerly Hoffman LaRoche) acquired 100 percent ownership of a mid-sized U.S. genetics company, Genentech. Only 20 years earlier, when Roche had been on an acquisition binge and bought dozens of companies—cosmetic companies, companies producing flavors and essences, and so on—it announced that these acquisitions would become successful by being
made into “Roche companies,” that is, by having them run and managed in the proven and superior Roche way. Few, if any, of these acquisitions have lived up to these expectations—and by now they have all been de-merged. But Genentech, while wholly owned, will be run as an independent company and in its own totally different way. To underscore this, Roche is selling 19 percent of Genentech on the stock market.

The foundation for the best-known earlier alliances, the joint ventures between U.S. and Japanese companies in the 1960s and 1970s, was still control—which may explain why so few of them survived as a joint venture even though the great majority were eminently successful as a business. The foundation of the new relationship is mutual trust.

The present merger boom is a surface phenomenon—the waves on the ocean’s surface rather than its currents. But currents make the climate rather than waves. The real structural changes, in other words, are the alliances and partnerships. They are creating a “different climate.” They create a different economy and require different management. They threaten to make obsolete traditional concepts of “bigness” such as the Fortune 500—still based, as they are, on control by ownership. These changes make the economy more flexible and more adaptable. But they also make it far less transparent and may make it more volatile. They surely require that executives acquire new skills, if not a different mindset.

They change, for instance, what we mean by “leadership.” For in these new alliances, partnerships, and co-existences, nobody commands. Nobody “reports.” No one is “the boss.” But no one is “the subordinate” either. The same executive who is the “senior” today may, in the same alliance or partnership, be the “junior” tomorrow. Yet, these partnerships and alliances are also not “teams”—every member works independently and with its own goals, objectives, and tasks. Making these new structures perform and work is a good deal more difficult than making the traditional command structure based on ownership and control work. But where they do work, they produce superior performance and superior results.