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Measuring the forces of long-term change
The 2009 Shift Index

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Foreword

A seemingly endless stream of books, articles, reports, and blogs make similar claims: The world is flattening; the economy has picked up speed; computing power is increasing; competition is intensifying.

Though we're aware of these trends in the abstract, we lack quantified measures. We know that a shift is underway, but we have no method of characterizing its speed or acceleration or making comparisons. Are rates of change increasing, decreasing, or settling into stable patterns (e.g. Moore's Law)? How do we compare exponential changes in bandwidth to linear increases in Internet usage? Without times series data and a methodology for integrating those data, we cannot identify, anticipate, or plan for change.

The Deloitte Center for the Edge – led by John Hagel III, John Seely Brown, and Lang Davison—fills that void. In this report, they describe their Shift Index. The Shift Index consists of three indices: Foundation, Flow, and Impact, and 25 metrics that together quantify the stock, pace, and implications of the shift. The Shift Index speaks metric to metaphor. The index enables analysts to anticipate changes, identify bottlenecks, and guide strategy. Not everyone will choose to monitor the same metrics or assign them the same weights. Thus, the Shift Index is less a single measure and more an informational playground that will give rise to a diversity of models and, a stronger collective sense about the pace and nature of change.

The Shift Index can be thought of as a new economy analog of the Composite Index of Leading Indicators, an old economy index that considers hours worked, unemployment applications, orders for capital goods, new building permits and the like. The Composite Index has its place, but its indicators don't respond until months if not years into a shift. Walk through an innovation sequence: Bandwidth increases creating space for new social media. Entrepreneurs formulate ideas. Venture capitalists finance projects. Proposals prove viable. Finally, mezzanine funding spurs a ramp up in employment. Only then, in this last stage, does the Composite Index identify the shift. Using the Composite Index to track shifts is like driving a car by staring into the rearview mirror. In contrast, the Shift Index lets us look out the front windshield.
As important as the index may prove for strategic applications, it may have more impact in how it changes our conception of the economy. Interpreted through the lens of neoclassical economics, the Shift Index captures shifts in fundamentals, particularly on the cost side where technological changes allow firms to do more with less. But, the Shift Index, by name alone, calls into question the neoclassical mindset that focuses on re-equilibration.

The Shift Index resonates instead with a conceptual model of the world economy based on complex dynamics. In this framework, the economy can be conceptualized as a complex adaptive system with diverse entities adaptively interacting to produce emergent patterns (and occasional large events). If one embraces the complex, dynamic nature of the economy, then the index can be appreciated in full – as a multidimensional measure of trends in the constraints and opportunities within that system. As constraints fall away and opportunities increase, old configurations become unstable and new structures emerge.

Shift happens. And, if we can measure shift, we can manage it.

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Contents

2 Executive Summary

6 Overview: Context, Findings and Implications

12 The Shift Index: Numbers and Trends

19 2009 Foundation Index

40 2009 Flow Index

78 2009 Impact Index

113 Shift Index Methodology

136 Acknowledgements

Executive Summary

In the midst of a steep recession, when it's all too easy to fixate on cyclical events, there's real danger of losing sight of deeper trends. Strictly cyclical thinking risks discounting or even ignoring powerful forces of longer-term change. To provide a clear, comprehensive, and sustained view of the deep dynamics changing our world, Deloitte LLP's Center for the Edge has developed a Shift Index consisting of three indices and 25 metrics designed to make longer-term performance trends more relevant and actionable.

Our first release of the Shift Index highlights a core performance challenge for the firm that has been playing out for decades. Remarkably, the return on assets (ROA) for U.S. firms has steadily fallen to almost one-quarter of 1965 levels at the same time that we have seen continued, albeit much more modest, improvements in labor productivity. While this deterioration in ROA has been particularly affected by trends in the financial sector, significant declines in ROA have occurred in the rest of the economy as well. Additional findings include the following:

- The ROA performance gap between winners and losers has increased over time, with the "winners" barely maintaining previous performance levels, while the losers experience rapid deterioration in performance.
- The "topple rate," at which big companies lose their leadership positions, has more than doubled, suggesting that "winners" have increasingly precarious positions.
- U.S. competitive intensity has more than doubled during the last 40 years.
- While the performance of U.S. firms is deteriorating, the benefits of productivity improvements appear to be captured in part by creative talent, which is experiencing greater growth in total compensation. Customers also appear to be gaining and using power as reflected in increasing customer disloyalty.
- The exponentially advancing price/performance capability of computing, storage, and bandwidth is driving an adoption rate for our new "digital infrastructure"[1] that is two to five times faster than previous infrastructures, such as electricity and telephone networks.

Given these long-term trends, we cannot reasonably expect to see a significant easing of performance pressure as the current economic downturn begins to dissipate—on the contrary, all long-term trends point to a continued erosion of performance. So what can be done to reverse these performance trends?

The answer to this question can be found in the three waves of deep change occurring in today's epochal "Big Shift." The first, the "Foundation" wave, involves changes to the fundamentals of our business landscape catalyzed by the emergence and spread of digital technology infrastructure and reinforced by long-term public policy shifts toward economic liberalization. The metrics in our Foundation Index monitor changes in these key foundations and provide leading indicators of the potential for change on other fronts. Changes in foundations have systematically and significantly reduced barriers to entry and to movement, leading to a doubling of competitive intensity.

The second, the "Flow" wave, focuses on the key driver of performance in a world increasingly shaped by digital infrastructure. This second wave looks at the flows of knowledge, capital, and talent enabled by the foundational advances, as well as the amplifiers of these flows. Because of higher unpredictability and volatility created by the Big Shift, knowledge flows are a particular key to improving performance. Developments on this front will likely lag behind the foundations metrics because of the time required to understand changes in foundations and develop new practices consistent with new opportunities.

[1] More than just bits and bytes, this digital infrastructure consists of institutions, practices, and protocols that together organize and deliver the increasing power of digital technology to business and society.

The third, the "Impact" wave, centers on the consequences of the Big Shift. Given the time it will take for the first two waves to play out and manifest themselves, this third wave—and its related index—provides an even greater lagging indicator. While current trends in firm performance indicate sustained deterioration, we expect, over time, that performance will improve as firms begin to figure out how to participate in and harness knowledge flows. Doing so will require significant institutional innovations, not just changes in practices, resulting in value creation through increasing returns performance improvement. In the end, these innovations will lead to a fundamental shift in rationale from scalable efficiency to scalable learning as firms use digital infrastructure to create environments where performance improvement accelerates as more participants join. Early signs of these changes are visible in the varied kinds of emerging open innovation and process network initiatives underway today.

The Shift Index seeks to measure these three waves of deep and overlapping change operating beneath the visible surfaces of today's events. The relative rates of change across the three indices will help executives understand where we are in the Big Shift and what to anticipate in the future. Current metrics indicate that we are still in the first wave of the Big Shift and facing challenges in moving forward into the second. Changes still manifest themselves much more as challenges rather than opportunities because our institutions and practices are still geared to earlier infrastructures. At the same time, an understanding of these three waves leads to significant insights about the moves required to reverse current performance trends:

- Deeper, yet strategic, restructuring of firm economics to generate maximum possible value from existing resources;
- Development of new management practices to more effectively catalyze and participate in growing knowledge flows; and
- Significant innovation in institutional arrangements to drive scalable participation in knowledge flows and reap the increasing returns to performance improvement.

The inaugural index will be regularly updated to track changes over time and expand the ability to compare performance trends across industries, countries, and firms.

Key Ideas

Foundation Index The fast moving, relentless evolution of a new digital infrastructure and shifts in global public policy are reducing barriers to entry and movement	**As computing costs drop, the pace of innovation accelerates**	Computing p. 25
	Plummeting storage costs solve one problem—and create another	Digital Storage p. 27
	As bandwidth costs drop, the world becomes flatter and more connected	Bandwidth p. 29
	Accelerating Internet adoption makes digital technology more accessible, increasing pressure as well as creating opportunity	Internet Users p. 31
	Wireless advances provide continual connectivity for knowledge exchanges	Wireless Subscriptions p. 34
	Increasing economic freedom further intensifies competition but also enhances the ability to compete and collaborate	Economic Freedom p. 36

Flow Index Sources of economic value are moving from "stocks" of knowledge to "flows" of new knowledge	**Individuals are finding new ways to reach beyond the four walls of their organization to participate in diverse knowledge flows**	Inter-Firm Knowledge Flows p. 46
	More diverse communication options are increasing wireless usage and significantly increasing the scalability of connections	Wireless Activity p. 51
	The rapid growth of Internet activity reflects both broader availability and richer opportunities for connection with a growing range of people and resources	Internet Activity p. 54
	Increasing migration suggests virtual connection is not enough – people increasingly seek rich and serendipitous face to face encounters as well	Migration of People to Creative Cities p. 58
	Travel volume continues to grow as virtual connectivity expands, indicating these may not be substitutes but complements	Travel Volume p. 63
	Capital flows are an important means not just to improve efficiency but also to access pockets of innovation globally	Movement of Capital p. 65
	Workers who are passionate about their jobs are more likely to participate in knowledge flows and generate value for companies	Worker Passion p. 70
	The recent burst of social media activity has enabled richer and more scalable ways to connect with people and build sustaining relationships that enhance knowledge flows	Social Media Activity p. 75

Impact Index Foundations and knowledge flows are fundamentally reshaping the economic playing field	Competitive intensity is increasing as barriers to entry and movement erode under the influence of digital infrastructures and public policy	Competitive Intensity p. 84
	Advances in technology and business innovation, coupled with open public policy and fierce competition, have both enabled and forced a long-term increase in labor productivity	Labor Productivity p. 87
	A long-term surge in competitive intensity, amplified by macro-economic forces and public policy initiatives, has led to increasing volatility and greater market uncertainty	Stock Price Volatility p. 90
	Cost savings and the value of modest productivity improvement tends to get competed away and captured by customers and talent	Asset Profitability p. 92
	Winning companies are barely holding on, while losers are rapidly deteriorating	ROA Performance Gap p. 95
	The rate at which big companies lose their leadership positions is increasing	Firm Topple Rate p. 97
	Market "losers" are destroying more value than ever before – a trend playing out over decades	Shareholder Value Gap p. 99
	Consumers possess much more power, based on the availability of much more information and choice	Consumer Power p. 101
	Consumers are becoming less loyal to brands	Brand Disloyalty p. 104
	As contributions from the creative classes become more valuable, talented workers are garnering higher compensation and market power	Returns to Talent p. 107
	As performance pressures rise, executive turnover is increasing	Executive Turnover p. 111

Overview: Context, Findings, and Implications

Introduction: The Big Shift

During a steep recession, managers obsess over short-term performance goals, such as cost cutting, sales, and market share growth. Meanwhile, economists chart data like GDP growth, unemployment levels, and balance-of-trade shifts to gauge the health of the overall business environment. The problem is, focusing only on traditional metrics often masks long-term forces of change that undercut normal sources of economic value.

"Normal" may in fact be a thing of the past: Even when the economy heats up again, companies' returns will remain under pressure. Trends set in motion decades ago are fundamentally altering the global business environment, abetted by a new digital infrastructure built on the sustained exponential pace of performance improvements in computing, storage, and bandwidth. This infrastructure is not just bits and bytes—it consists of institutions, practices, and protocols that together organize and deliver the increasing power of digital technology to business and society. This power must be harnessed if business is to thrive.

No one, to our knowledge, has yet quantified the dimensions of deep change precipitated by digital technologies and public policy shifts. Fragmentary metrics and sporadic studies exist, to be sure. But nothing yet captures a clear, comprehensive, and sustained view of the deep dynamics changing our world. We experience instead a daily bombardment of short-term economic indicators—employment, inventory levels, inflation, commodity prices, etc.

To help managers in this decidedly challenging time, we have developed a framework for understanding three waves of transformation in the competitive landscape: foundations for major change; flows of resources, such as knowledge, that allow firms to enhance productivity; and the impacts of the foundations and flows on companies and the economy. Combined, those factors reflect what we call the Big Shift in the global business environment. Additionally, we have developed a Shift Index consisting of three indices that quantify the three waves of long-term change we see happening today. By quantifying these forces, we seek to help institutional leaders steer a course for "true north," while helping to minimize distraction from short-term events—and the growing din of metrics that reflect them.

Today we face epochal challenges that continue to intensify. Steps we take now to address them will not only help us to weather today's economic storm but also position us to create significant economic value in an ever-more challenging business landscape. We believe that the Shift Index can serve as a useful compass and catalyst for the discussions and actions required to make this happen.

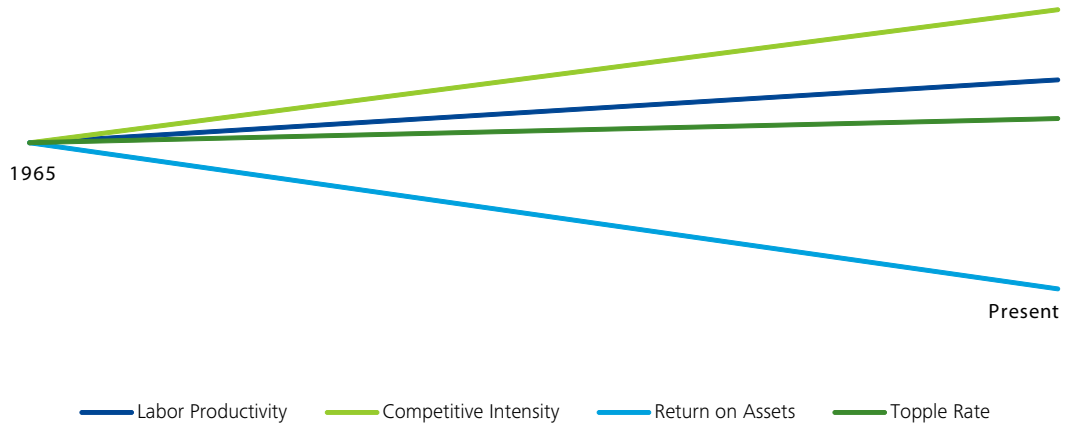
Key Findings

Our first release of the Shift Index highlights a core performance challenge and paradox for the firm that has been playing out for decades. ROA for U.S. firms has steadily fallen to almost one-quarter of 1965 levels at the same time that we have seen continued, albeit much more modest, improvements in labor productivity. While this deterioration in ROA has been particularly affected by trends in the financial sector, significant declines in ROA have occurred in the rest of the economy as well. Some additional findings that highlight the performance challenges facing U.S. firms include the following:

- The gap in ROA performance between winners and losers has increased over time, with the "winners" barely maintaining previous performance levels, while the losers experience rapid deterioration in performance.
- The "topple rate," at which big companies lose their leadership positions, has more than doubled, suggesting that "winners" have increasingly precarious positions.
- U.S. competitive intensity has more than doubled during the last 40 years.
- While the performance of U.S. firms is deteriorating, at least some of the benefits of the productivity improvements appear to be captured by creative talent, which is experiencing greater growth in total compensation. Customers also appear to be gaining and using power as reflected in increasing customer disloyalty toward brands.
- The exponentially advancing price/performance capability of computing, storage, and bandwidth is driving an adoption rate for the digital infrastructure that is two to five times faster than previous infrastructures, such as electricity and telephone networks.

These findings have two levels of implication. First, the gap between potential and realized firm performance is steadily widening as productivity grows at a rate far slower than the underlying performance increases of the digital infrastructure. Potential performance refers to the opportunity companies have to harness the increasing power and capability of the digital infrastructure to create higher returns for themselves as they achieve even higher levels of productivity improvement through product, process, and institutional innovations.

Exhibit 1: Firm performance metric trajectories (1965-2008)



Source: Deloitte analysis

Second, the financial performance of the firm continues to deteriorate as a quickly evolving digital infrastructure and public policy liberalization combine to intensify competition. (Recent regulatory moves to the contrary, the overwhelming policy trend since World War II has been toward reducing barriers to entry and movement in terms of freer trade and investment flows as well as deregulation of major industries.) The benefits from the modest productivity improvements companies have achieved increasingly accrue not to the firm or its shareholders, but to creative talent and customers, who are gaining market power as competition intensifies.

How do we reverse this trend? For precedent and inspiration, we might look to the generation of companies that emerged in the early-20th century. As Alfred Chandler and Ronald Coase later made clear, these companies discovered how to harness the capabilities of newly emerging energy, transportation, and communication infrastructures to generate efficiency at scale. Today's companies must make the most of our own era's new infrastructure through institutional innovations that shift the rationale from scalable efficiency to scalable learning by using digital infrastructure to create environments where performance improvement accelerates as more participants join, as illustrated in various kinds of emerging open innovation and process network initiatives. Only then will the corporate sector generate greater productivity improvement from the rapidly evolving digital infrastructure and capture their fair share of the ensuing rewards. As this takes place, the Shift Index will turn from an indicator of corporate decline to one reflecting powerful new modes of economic growth.

Three Waves; Three Indices

The trends reported above, and the connections across them, are consistent with the theoretical model we used to define and structure the metrics in the Shift Index. The Shift Index seeks to measure three waves of deep and overlapping change operating beneath the visible surfaces of today's events. In brief, this theoretical model suggests that a first wave of change in the foundations of our business and society are expanding flows of knowledge in a second. These two waves will intensify competition in the near term and put increasing pressure on corporate performance. Later, institutional innovations emerging in a third wave of change will harness the unique potential of these foundations and flows, improving corporate performance as more value is created and delivered to markets. In other words, change occurs in distinct waves that are causally related.

To quantify these waves, we broke the corresponding Shift Index into three separate indices. In this section, we will explain each wave and the metrics we have chosen to represent it.

The first wave involves the fast-moving, relentless evolution of a new digital infrastructure and shifts in global public policy that have reduced barriers to entry and movement, enabling vastly greater productivity, transparency, and connectivity. Consider how companies can use digital technology to create ecosystems of diverse, far-flung users, designers, and suppliers in which product and process innovations fuel performance gains without introducing too much complexity. This wave is represented in the first index of the Shift Index—the Foundation Index. It quantifies and tracks the rate of change in the foundational forces taking place today.

The Foundation Index reflects new possibilities and challenges for business as a result of new technology capability and public policy shifts. In this sense, it is a leading indicator because it shapes opportunities for new business and social practices to emerge in subsequent waves of change as everyone seeks to explore and master new potentialities. However, business will also be exposed to challenges as a result of increased competition. Key metrics in this index include the change in performance of the technology components underlying the digital infrastructure, growth in the adoption rate of this infrastructure, and the degree of product and labor market regulation in the economy.

The second wave of change (represented in the second index in the Shift Index, the Flow Index) is characterized by the increasing flows of capital, talent, and knowledge across geographic and institutional boundaries. In this

wave, intensifying competition and the increasing rate of change precipitated by the first wave shifts the sources of economic value from "stocks" of knowledge to "flows" of new knowledge.

Knowledge flows—which occur in any social, fluid environment where learning and collaboration can take place—are quickly becoming one of the most crucial sources of value creation. Facebook, Twitter, LinkedIn, and other social media foster them, as do virtual communities and online discussion forums and companies situated near one another, working on similar problems. Twentieth-century institutions built and protected knowledge stocks—proprietary resources that no one else could access. The more the business environment changes, however, the faster the value of what you know at any point in time diminishes. In this world, success hinges on the ability to participate in a growing array of knowledge flows in order to rapidly refresh your knowledge stocks. For instance, when an organization tries to improve cycle times in a manufacturing process, it finds far more value in problem solving shaped by the diverse experiences, perspectives, and learning of a tightly knit team (shared through knowledge flows) than in a training manual (knowledge stocks) alone.

Knowledge flows can help companies gain competitive advantage in an age of near-constant disruption. The software company SAP, for instance, routinely taps the more than 1.5 million participants in its Developer Network, which extends well beyond the boundaries of the firm. Those who post questions for the network community to address will receive a response in 17 minutes, on average, and 85 percent of all the questions posted to date have been rated as "resolved." By providing a virtual platform for customers, developers, system integrators, and service vendors to create and exchange knowledge, SAP has significantly increased the productivity of all the participants in its ecosystem.

The metrics in the Flow Index capture physical and virtual flows as well as elements that can amplify a flow—examples of these "amplifiers" include social media use and the degree of passion with which employees are engaged with their jobs. This index represents how quickly individual and institutional practices are able to catch up with the opportunities offered by the advances in digital infrastructure. The Flow Index illustrates a conceptual way to represent practices. Given the slower rate with which social and professional practices change relative to the digital infrastructure, this index will likely serve as a lagging indicator of the Big Shift, trailing behind the Foundation Index. It will be useful to track the degree of lag over time.

The good news is that strong foundational technology is enabling much richer and more diverse knowledge flows. The bad news is that mind-sets and practices tend to hamper the generation of and participation in those flows. That is why we give such prominence to them in the second wave of the Big Shift. The number and quality of knowledge flows at a firm—partly determined by its adoption of openness, cross-enterprise teams, and information sharing—will be key indicators of its ability to master the Big Shift and turn performance challenges into opportunities. The ultimate differentiator among companies, though, may be a competency for creating and sharing knowledge across enterprises. Growth in intercompany knowledge flows will be a particularly important sign that firms are adopting the new institutional architectures, governance structures, and operational practices necessary to take full advantage of the digital infrastructure.

The final wave—captured by the Impact Index—reflects how well companies are exploiting foundational improvements in the digital infrastructure by creating and sharing knowledge—and what impacts those changes are having on markets, firms, and individuals. For now, institutional performance is broadly suffering in the face of intensifying competition. But over time, as firms learn how to harness the digital infrastructure and participate more effectively in knowledge flows, their performance will improve.

Differences in approach between top performing and underperforming companies are telling. As some organizations participate more in knowledge flows, we should see them break ahead of the pack and significantly improve overall performance in the long term. Others, still wedded to the old ways of operating, are likely to deteriorate quickly.

This conceptual framework for the Big Shift underscores the belief that knowledge flows will be the key determinant of company success as deep foundational changes alter the sources of value creation. Knowledge flows thus serve as the key link connecting foundational changes to the impact that firms and other market participants will experience.

To respond to the growing long-term performance pressures described earlier, companies must design and then track operational metrics showing how well they participate in knowledge flows. For example, they might want to identify relevant geographic clusters of talent around the world and assess their access to that talent. In addition, they might want to track the number of institutions with which they collaborate to improve performance. Success against these metrics will provide a clue as to how well companies will perform later as the Big Shift continues to unfold.

Implications for Business Executives

Our research findings highlight the stark performance challenges for companies. What is more, the data suggest that unless firms take radical action, the gap between their potential and their realized opportunities will grow wider. That is because the benefits from the modest productivity improvements that companies have achieved increasingly accrue not to the firm or its shareholders, but to creative talent and customers, who are gaining market power as competition intensifies.

Until now, companies were designed to become more efficient by growing ever larger, and that is how they created considerable economic value. However, the rapidly changing digital infrastructure has altered the equation: As stability gives way to change and uncertainty, institutions must increase not just efficiency but also the rate at which they learn and innovate, which, in turn, will boost their rate of performance improvement. Scalable efficiency, as mentioned above, must be replaced by scalable learning. The mismatch between the way companies are operated and governed on the one hand and how the business landscape is changing on the other helps to explain why returns are deteriorating while talent and customers reap the rewards of productivity.

In contrast to the 20th century—when senior management decided what shape a company should take in terms of culture, values, processes, and organizational structure—now we will see institutional innovations largely propelled by individuals, especially the younger workers, who put digital technologies, such as social media, to their most effective use. Findings from our research indicate a correlation between the rapidly growing use of social media and the increasing knowledge flows between organizations.

Worker passion also appears to be an important amplifier: When people are engaged with their work and pushing the performance envelope, they seek ways to connect with others who share their passion and who can help them improve faster. Self-employed people are more than twice as likely to be passionate about their work as those who work for firms, according to a survey we conducted. This suggests a potential red flag for institutional leaders—companies appear to have difficulty holding onto passionate workers.

But management can play an important supporting role, recognizing that passionate employees are often talented and motivated but also tend to be unhappy because they

see a lot of potential for themselves and their companies, although they can feel blocked in their efforts to achieve it. Management should identify those who are adept participants in knowledge flows, provide them with platforms and tools to pursue their passions, equip them with proper guidance and governance, and then celebrate their successes to inspire others.

Performance pressures will continue to increase well past the current downturn. As a result, beneath these surface pressures are underlying shifts in practices and norms that are driven by the continuous advances in the digital infrastructure:

- **A rich medium for connectivity and knowledge flows is emerging** as wireless subscriptions have grown from one percent of the U.S. population in 1985 to 83 percent in 2008, at a 32 percent compound annual growth rate (CAGR). As a result of technology advances in the areas of computing, storage, and bandwidth, innovations, such as 3G and emerging 4G wireless networks, and more powerful and affordable access devices, such as smart phones and netbooks, the line between the Internet and wireless media will continue to blur, moving us to a world of ubiquitous connectivity.
- **Practices from personal connectivity are bleeding over into professional connectivity**—institutional boundaries are becoming increasingly permeable as employees harness the tools they have adopted in their personal lives to enhance their professional productivity, often without the knowledge of, and sometimes over the opposition of, corporate authorities. Of the people that currently use social media to connect to professionals in other firms, 60 percent claimed they are participating more heavily in this activity than last year.
- **Talent is migrating to the most vibrant geographies and institutions** because that is where they can improve their performance more rapidly by learning faster. Our analysis has shown that the top 10 creative cities have outpaced the bottom 10 in terms of population growth since 1990. Between 1990 and 2008, the top 10 creative cities grew more than twice as fast as the bottom 10.
- **Companies appear to have difficulty holding onto passionate workers.** Workers who are passionate about their jobs are more likely to participate in knowledge flows and generate value for their companies—on average, the more passionate participate twice as much as the disengaged in nearly all the knowledge flows activities surveyed. We also found that self-employed people are more than twice as likely to be passionate about their work as those who work for firms. The current evolution in employee mind-set and shifts in the talent marketplace require new rules on managing and retaining talent.

Leaders must move beyond the marginal expense cuts on which they might be focusing now in order to weather the recession. They need instead to be ruthless about deciding which assets, metrics, operations, and practices have the greatest potential to generate long-term profitable growth and shedding those that do not. They must keep coming back to the most basic question of all: What business are we really in?

It is not just about being lean but also about making smart investments in the future. One of the easiest but most powerful ways firms can achieve the performance improvements promised by technology is to jettison management's distinction between creative talent and the rest of the organization. All workers can continually improve their performance by engaging in creative problem solving, often by connecting with peers inside and outside the firm. Japanese automakers used elements of this approach with dramatic effects on the bottom line, turning assembly-line employees from manual laborers into problem solvers.

At the end of the day, the Big Shift framework puts a number of key questions on the leadership agenda: Are companies organized to effectively generate and participate in a broader range of knowledge flows, especially those that go beyond the boundaries of the firm? How can they best create and capture value from such flows? And most importantly, how do they measure their progress navigating the Big Shift in the business landscape? We hope that the Shift Index will help executives answer those questions—in these difficult times and beyond.

The Shift Index: Numbers and Trends

Shift Index Structure

There is no shortage of indicators for measuring today's cyclical events, but what we often need is a way to quantify long-term trends. Our Shift Index, a composite of 25 metrics tracking a variety of concepts, is a way to measure the deep, secular forces underlying today's cyclical change.

The Shift Index consists of three indices—the Foundation Index, Flow Index, and Impact Index—that quantify the three waves of the Big Shift. Exhibit 2 summarizes these indices and describes the specific indicators included in each.

Exhibit 2: Shift index indicators

Impact Index	Markets	**Competitive Intensity**: Herfindahl-Hirschman Index **Labor Productivity:** Index of labor productivity as defined by the Bureau of Labor Statistics **Stock Price Volatility:** Average standard deviation of daily stock price returns over one year
	Firms	**Asset Profitability:** Total ROA for all US firms **ROA Performance Gap:** Gap in ROA between firms in the top and the bottom quartiles **Firm Topple Rate:** Annual rank shuffling amongst US firms **Shareholder Value Gap:** Gap in the TRS[1] between firm in the top and the bottom quartiles
	People	**Consumer Power:** Index of 6 consumer power measures **Brand Disloyalty:** Index of 6 consumer disloyalty measures **Returns to Talent:** Compensation gap between more and less creative occupational groupings[2] **Executive Turnover:** Number of Top Management terminated, retired or otherwise leaving companies
Flow Index	Virtual Flows	**Inter-firm Knowledge Flows:** Extent of employee participation in knowledge flows across firms **Wireless Activity:** Total annual volume of mobile minutes and SMS messages **Internet Activity:** Internet traffic between top 20 US cities with the most domestic bandwidth
	Physical Flows	**Migration of People to Creative Cities:** Population gap between top and bottom creative cities[2] **Travel Volume:** Total volume of local commuter transit and passenger air transportation[3] **Movement of Capital:** Value of US Foreign Direct Investment inflows and outflows
	Amplifiers	**Worker Passion:** Percentage of employees most passionate about their jobs **Social Media Activity:** Time spent on Social Media as a percentage of total Internet time
Foundation Index	Technology Performance	**Computing:** Computing power per unit of cost **Digital Storage:** Digital storage capacity per unit of cost **Bandwidth:** Bandwidth capacity per unit of cost
	Infrastructure Penetration	**Internet Users:** Number of people actively using the Internet as compared to the US population **Wireless Subscriptions**: Percentage of active wireless subscriptions as compared to the US population
	Public Policy	**Economic Freedom**: Index of 10 freedom components as defined by the Heritage Foundation

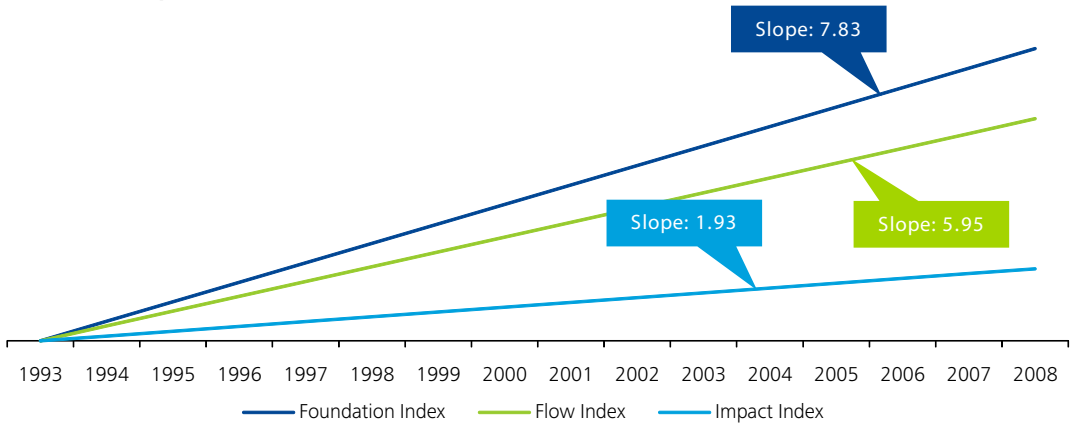
1. TRS – Total Return to Shareholders
2. Creative occupations and cities defined by Richard Florida's "The Rise of the Creative Class." 2004
3. Measured by the Bureau of Transportation Statistics Transportation Services Index

Source: Deloitte analysis

The inaugural Shift Index focuses on the U.S. economy and U.S. industries, although the analysis of industry-level data will be covered in a supplement to this report to be issued in Fall 2009. Subsequent releases will broaden the Shift Index to a global scale and will provide a diagnostic tool to assess the performance of individual companies relative to a set of firm-level metrics.

The choice of metrics above was the result of a robust selection process. Many metrics are directional proxies chosen in the absence of ideal alternatives. Some are drawn from secondary data sources and analytical methodologies; others are proprietary. Given the limited data we could find or generate to directly measure the forces underlying the Big Shift, we have not attempted to prove causality, although we have not refrained from offering hypotheses regarding potential causal links. In this regard, we hope the Shift Index will catalyze research by others to test and refine our findings.

Exhibit 3: Component index trends (1993-2008)



Source: Deloitte analysis

The Three Indices: A Comparative Discussion

Findings from the 2009 Shift Index suggest that deep changes in our economic foundations continue to outpace the flows of knowledge they enable and their impact on markets, firms, and people. Fitting a trend line to each of the three indices, we see that the Foundation Index has moved much more quickly in the past 15 years (with a slope of 7.83) relative to the Flow Index (5.95) and the Impact Index (1.93). These comparative rates of change are shown in Exhibit 3.

Tracking these relative rates of change helps us to determine the economy's position in the Big Shift as a whole. This initial release of the Shift Index suggests that the United States is still largely in the first wave of the Big Shift, although specific industries vary in their positions and are moving at different rates.

We expect that companies, industries, and economies in the earliest stage of the Big Shift will see the highest rates of change in the Foundation Index. Over time, as the Big Shift gathers momentum and pervades broader sectors of the economy and society, the Flow Index and Impact Index will likely pick up speed, while the rate of technological improvement and penetration captured by the Foundation Index will begin to slow.

Comparing the relative rates of change and magnitudes of the three indices reveals telling gaps. The gap between the Foundation Index (153) and the Impact Index (111), for example, defines the scope of the challenges and opportunities that arise from rapidly changing digital infrastructure. Essentially, it measures the economic instability that results from performance potential (reflected by the Foundation Index) rising more quickly than realized performance (reflected in the Impact Index). If realized performance is significantly lower than potential performance, there is growing room for disruptive innovation to narrow this gap. In this sense, the gap is also a measure of the opportunity awaiting creative companies that determine how to more effectively harness the capabilities of digital infrastructure. Given the sustained exponential performance increases in digital technology, this gap is unlikely to close in the relevant future. But it can be narrowed by a substantial increase in the rate at which businesses innovate and learn.

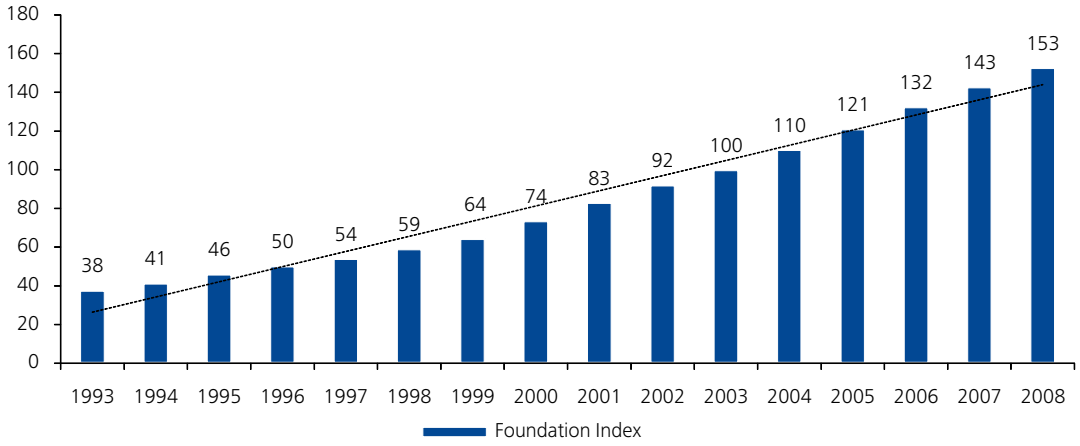
Insight also emerges from relative changes in the gaps between the Foundation Index and the Flow Index and between the Flow Index and Impact Index. The Foundation-Flow gap measures the ability of individuals and institutions to leverage the digital infrastructure to generate knowledge flows through new social and business practices. The Flow-Impact gap measures how well market participants harness these knowledge flows to capture value for themselves.

Our initial findings show that the Flow-Impact gap is substantially larger than the Foundation-Flow gap, meaning that participants are relatively more successful at generating new knowledge flows than at capturing their value. Relative changes in these gaps over time will provide executives with an important measure of where progress is being made, where obstacles exist, and where management attention needs to be paid.

2009 Foundation Index

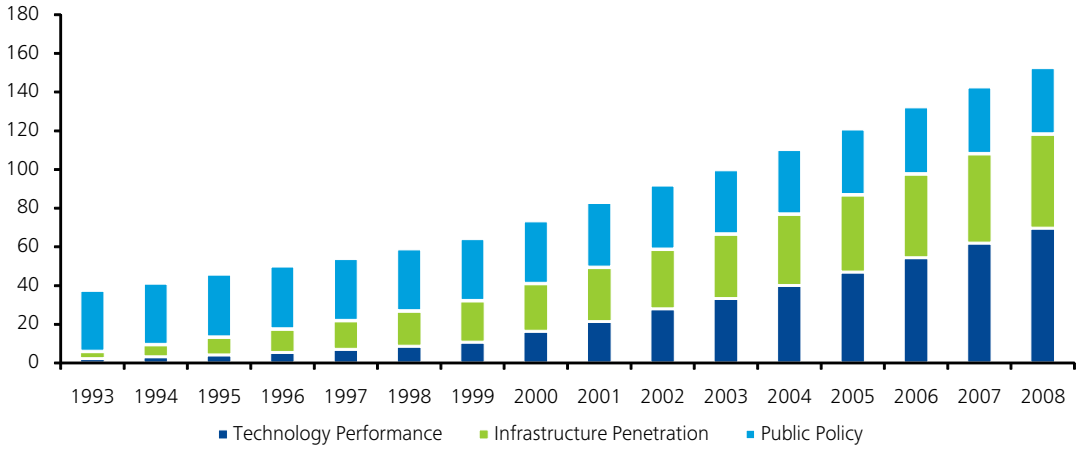
The Foundation Index, with an index value of 153 in 2008, has increased at a 10 percent compound annual growth rate (CAGR) since 1993.[2] This index, shown in Exhibit 4, tells the story of a swiftly moving digital infrastructure propelled by unremitting price performance improvements in computing, storage, and bandwidth that show no signs of stabilizing.

Exhibit 4: Foundation Index (1993-2008)



Source: Deloitte analysis

Exhibit 5: Foundation Index drivers (1993-2008)



Source: Deloitte analysis

[2] For further information on how the Foundation Index is calculated, please refer to the Shift Index Methodology section.

Our findings show that the rate of change in the performance of technology building blocks substantially exceeds the rate of change of the two other foundational metrics—adoption rates and public policy shifts. It remains the primary driver of the strong secular change captured by the Foundation Index as a whole.

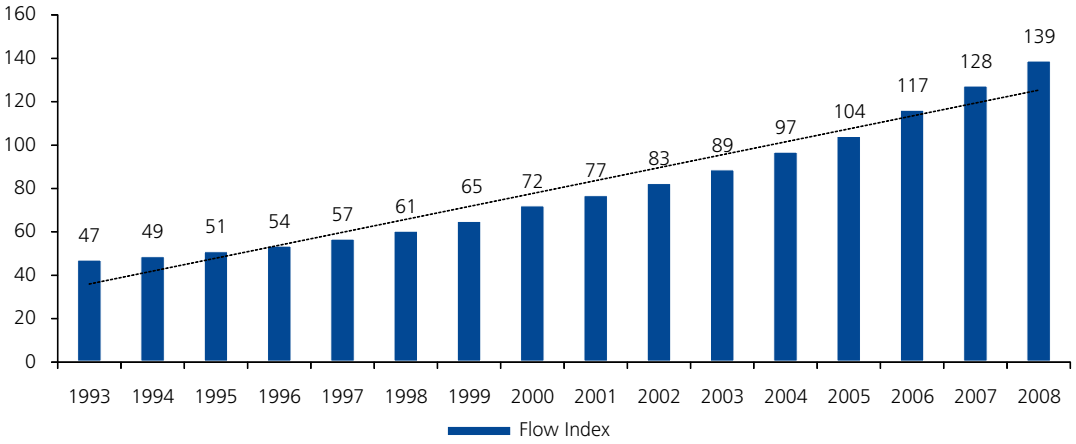
As Exhibit 5 demonstrates, Technology Performance metrics (e.g., Computing, Digital Storage and Bandwidth) have been driving the changes in the Foundation Index since 1993. These metrics have been increasing rapidly at a 26 percent CAGR as a result of technological innovations and decreasing costs. Infrastructure Penetration metrics (e.g., Internet Users and Wireless Subscriptions) have been growing slower, but at a still significant CAGR of 19 percent. Public policy has maintained a relatively constant position in the Foundation Index for the past 15 years.

However, policy is still a key wild card. There is considerable risk that policy responses to the current economic downturn may increase barriers to entry and movement. The Shift Index will represent this trend over time relative to the changes in the other foundations.

2009 Flow Index

The Flow Index, with an index value of 139 in 2008, has increased at a seven percent CAGR since 1993.[3] The Flow Index, shown in Exhibit 6, measures the rate of change and magnitude of knowledge flows resulting from the advances in digital infrastructure and public policy liberalization.

Exhibit 6: Flow Index (1993-2008)



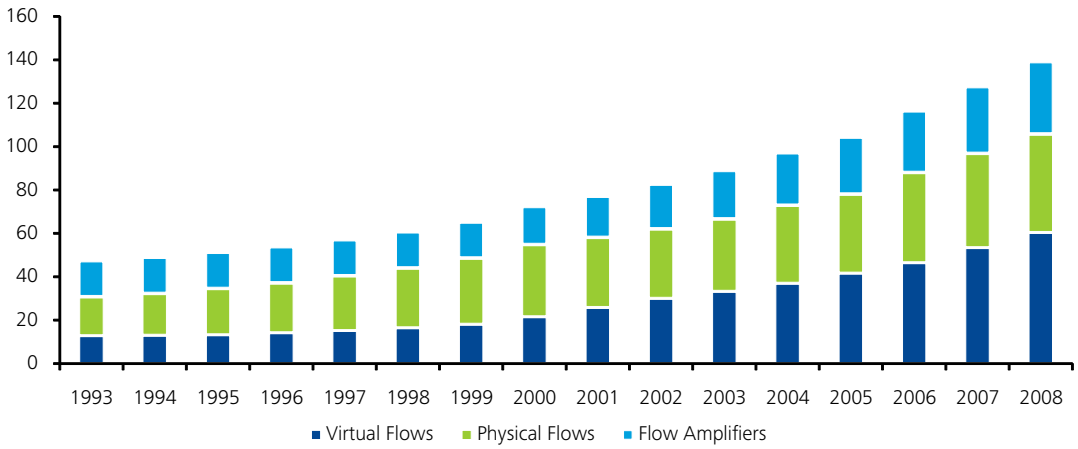
Source: Deloitte analysis

[3] For further information on how the Flow Index is calculated, please refer to the Shift Index Methodology section.

When considering the Flow Index, it's important to bear in mind that the face-to-face interactions driving the most valuable knowledge flows—resulting in new knowledge creation—are difficult to measure directly, forcing us to rely on proxies like Migration of People to Creative Cities and Travel Volume to provide indirect measures of this kind of activity. Social media use, conference and Web-cast attendance, professional information and advice shared by telephone and in lunch meetings—all of these serve as suggestive proxies of various kinds of knowledge flows.

As Exhibit 7 demonstrates, Virtual Flow metrics (e.g., Inter-Firm Knowledge Flows, Wireless Activity, and Internet Activity) have been driving the index, increasing at an 11 percent CAGR.

Exhibit 7: Flow Index drivers (1993-2008)



Source: Deloitte analysis

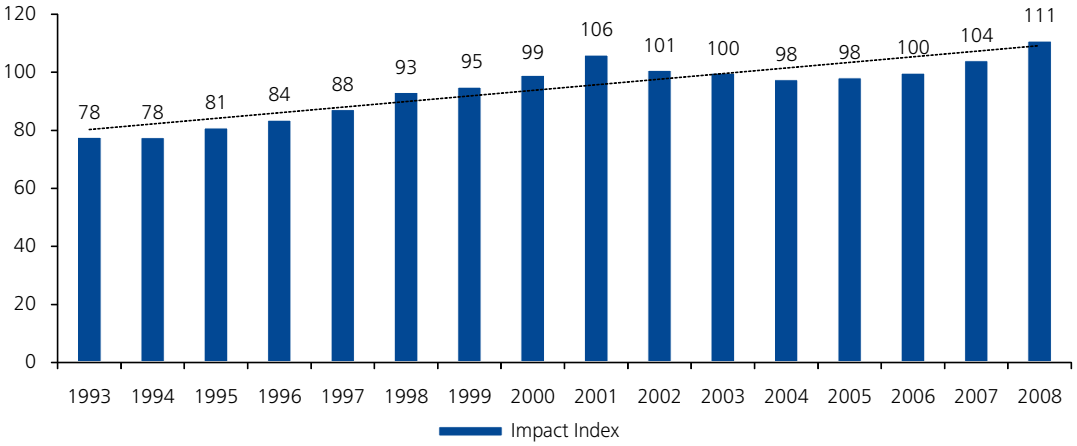
While virtual flows are gaining importance as a result of technological advancements, physical flows are still a key to knowledge creation and transfer. As a result, Physical Flow metrics (e.g., Movement of Capital, Migration of People to Creative Cities, and Travel Volume) maintain a significant contribution to the Flow Index, increasing at a six percent CAGR since 1993. Flow Amplifiers (e.g., Worker Passion and Social Media Activity) have also been gaining importance and are expected to be a major driver of the index in the future.

2009 Impact Index

The Impact Index, with an index value of 111 in 2008, has grown at a 2.4 percent CAGR since 1993. This index, shown in Exhibit 8, captures the dynamics of firms' performance as they respond to increasing competition and productivity, as well as powerful new classes of consumers and talent.[4]

[4] For further information on how the Impact Index is calculated, please refer to the Shift Index Methodology section.

Exhibit 8: Impact Index (1993-2008)

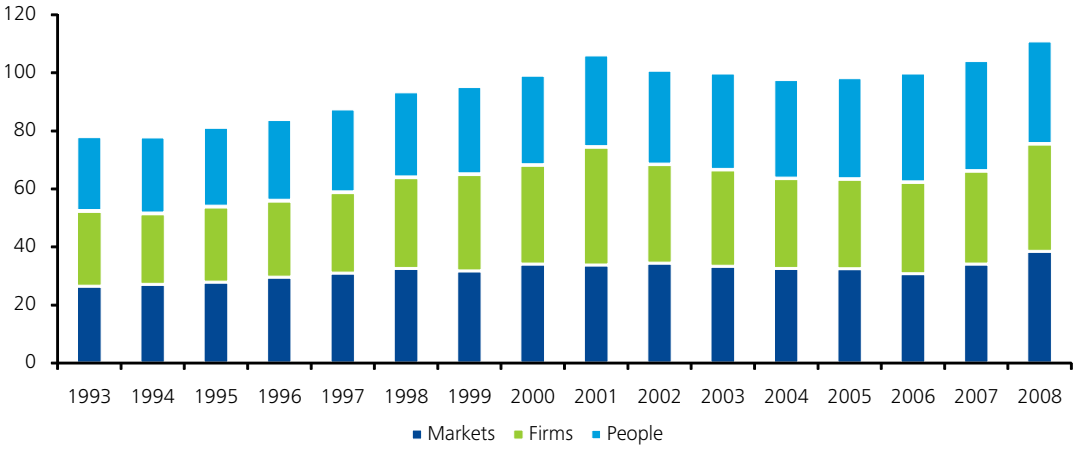


Source: Deloitte analysis

This index is designed to measure the rate of change and magnitude of the impact of the Big Shift on three key constituencies: Markets, Firms, and People. For People, it attempts to determine how effective they are as consumers and creative talent at harnessing the benefits of knowledge flows unleashed by advances in the core digital infrastructure. Because they are already good at doing this—and are only getting better at it—the index is set to increase as they derive more value from the Big Shift.

At least in the short term, however, Markets and Firms appear to be moving in the opposite direction. Partly at the hands of the consumers and talent who are doing so well, pressures on returns are unparalleled, and the traditional way of doing business is increasingly under siege. So as markets grow more volatile, competition intensifies, and firm performance declines, the Impact Index will also increase.

Exhibit 9: Impact Index drivers (1993-2008)



Source: Deloitte analysis

Albeit small shifts in the Impact Index are indicative of powerful trends. For example, Exhibit 9 shows that where we are today (an index value of 111) is the result of parallel growth in the impact of the Big Shift on all three constituencies. The Markets driver, for example, has gone up more than 45 percent since 1993, at a CAGR of 2.5 percent, indicating that competitive pressures are rising steeply. Strikingly similar is the increase in the Firms driver, which measures the negative effect of these pressures on corporate performance and returns. This driver has increased by 43 percent since 1993, itself just shy of a 2.5 percent CAGR. This relationship between growth in market pressures and deterioration of firm performance, which is nearly one to one, is particularly revealing with regard to the mismatch between today's management approaches and the forces of the Big Shift. Finally, while we are forced to make assumptions when it comes to the impact of these forces on People, because our way of measuring this through a recent survey precludes us from assessing historical trends, we intuitively know that technological platforms and knowledge flows tend to change the world first on a social level, well before institutions catch on. So while we cannot accurately calculate how it has changed for them over time, we can reasonably assume that people have been most affected by the Big Shift and the most consistently.

We must note that the Impact Index is more susceptible to economic cycles than the other two indices, and as such, the three drivers show much more volatility. The recessions in 2001 and 2008 particularly moved the needle, representing much greater pressures on firms, consumers, and talent during those times. As one would expect, firm performance metrics (e.g., Asset Profitability, ROA Performance Gap, Firm Topple Rate, and Shareholder Value Gap) are affected most by these economic events.

To limit the extent to which cyclical fluctuations can sway the Impact Index, we have used data smoothing to put the focus on long-term trends instead of short-term movements (for further information on data smoothing, please refer to the Shift Index Methodology section).

Once peaks and valleys are removed, we see clearly that the growing power of creative talent and consumers, a driving force behind competitive intensity, is sapping value from corporations at the same time that labor productivity is on the rise.

2009 Foundation Index

25 **Computing:** As computing costs drop, the pace of innovation accelerates

27 **Digital Storage:** Plummeting storage costs solve one problem—and create another

29 **Bandwidth:** As bandwidth costs drop, the world becomes flatter and more connected

31 **Internet Users:** Accelerating Internet adoption makes digital technology more accessible, increasing pressure as well as creating opportunity

34 **Wireless Subscriptions:** Wireless advances provide continual connectivity for knowledge exchanges

36 **Economic Freedom:** Increasing economic freedom further intensifies competition but also enhances the ability to compete and collaborate

2009 Foundation Index

153

The fast moving, relentless evolution of a new digital infrastructure and shifts in global public policy are reducing barriers to entry and movement

The Foundation Index quantifies the first wave of the Big Shift, which involves the fast-moving, relentless evolution of a new digital infrastructure and shifts in global public policy that have reduced barriers to entry and movement.

Key findings include:

- The exponentially advancing price/performance capability of computing, storage, and bandwidth is contributing to an adoption rate for the digital infrastructure that is two to five times faster than previous infrastructures, such as electricity and telephone networks.
- The cost of one MM transistors has steadily dropped from over $222 in 1992 to $0.27 in 2008, leveling the playing field by reducing the importance of scale and thus increasing opportunities for innovation. Intel technologists anticipate this trend to continue for at least the next four generations of processors.
- The cost of one gigabyte (GB) of storage has been decreasing at an exponential rate from $569 in 1992 to $0.13 in 2008. The increase of both storage and bandwidth has helped to enable the boom in user-generated content, which has helped to break down information asymmetries between vendors and customers who now have easier access to product price and quality information. The cost of 1,000 Mbps (megabits per second), which refers to data transfer speed, dropped 10 times from over $1,197 in 1999 to $130 in 2008, allowing for cheaper and more reliable data transfer.
- The percentage of the U.S. population using the Internet has grown from one percent in 1990 to 63 percent in 2008, taking less time to penetrate 50 percent of U.S. households than any other technology in history. As access continues to spread and as content and services improve, we expect the Internet to become an increasingly dominant enabler of the robust knowledge flows central to economic value creation.
- Wireless subscriptions have grown dramatically since 1965, jumping from one percent of the U.S. population to more than 83 percent in 2008, creating another medium for connectivity and knowledge flows. As core digital technology continues to improve, the line between the Internet and wireless media will continue to blur, further enhancing our abilities to connect regardless of physical location.
- U.S. Economic Freedom has shown an upward trend from 1995 to 2008, increasing five percent over that period while consistently staying above the world average. Over the past 15 years, it was primarily driven by investment freedom (a 14 percent increase), financial freedom (a 14 percent increase), trade freedom (an 11 percent increase), and business freedom (an eight percent increase). While there is no prospect for a near-term leveling of improvements in digital technology, the trend toward increasingly open public policy is uncertain moving forward. The current turmoil in world markets has created a very real potential for a policy backlash and a rebuilding of protectionist barriers. These barriers would detract from the benefits created by advances in the digital infrastructure and its adoption by market participants. It is encouraging, however, that while a move to protectionist policies is certainly possible, it would be difficult to sustain unless large parts of the world followed suit.

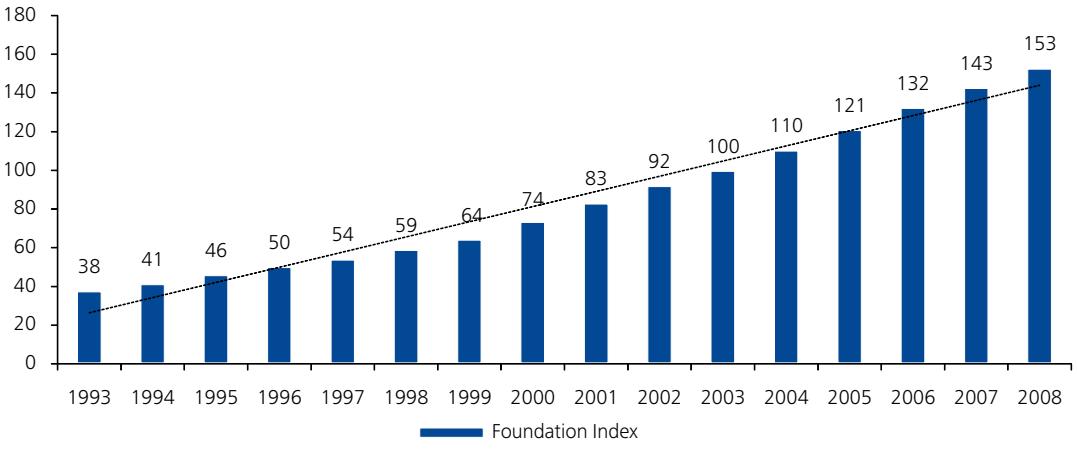
Advances in computing, storage, and bandwidth, coupled with wireless networks and powerful devices such as smart phones and netbooks, have created an increasingly robust platform for users to connect and communicate anywhere and anytime. Meanwhile, access to this platform has become easier and more affordable, creating a new foundation for the ways we interact and participate in knowledge flows.

These foundational changes define a new performance potential and thus reflect both new possibilities and challenges. This new potential refers to the opportunity companies have to precipitate, participate in, and profit from knowledge flows enabled by an ever-improving digital infrastructure and the reduction in interaction costs that make it easier to coordinate complex activities on a global scale. At the same time, these foundational changes also represent significant and growing challenges for firms. Technological advances and economic liberalization have systematically and significantly reduced barriers to entry and movement. This, in turn, has substantially increased competitive intensity (see the Competitive Intensity metric in the Impact Index) and has generated growing performance pressure (see the Firms metrics in the Impact Index). However, by adjusting institutional architectures, governance structures, and operational practices, companies and institutions can harness the powerful potential brought about by the Big Shift and progressively turn mounting challenges into growing opportunities.

The Index

The Foundation Index, as shown in Exhibit 10, has a 2008 value of 153 and has increased at a 10 percent CAGR since 1993.[5] Its metrics capture the price/performance trends in technology, its adoption by the U.S. population, and corresponding advances in public policy. The Foundation Index is a leading indicator: Advances in core technologies and their adoption define the potential for firm performance. However, this potential will take quite some time to materialize in performance, as institutions lag behind at developing practices that truly leverage the digital infrastructure.

Exhibit 10: Foundation Index (1993-2008)



Source: Deloitte analysis

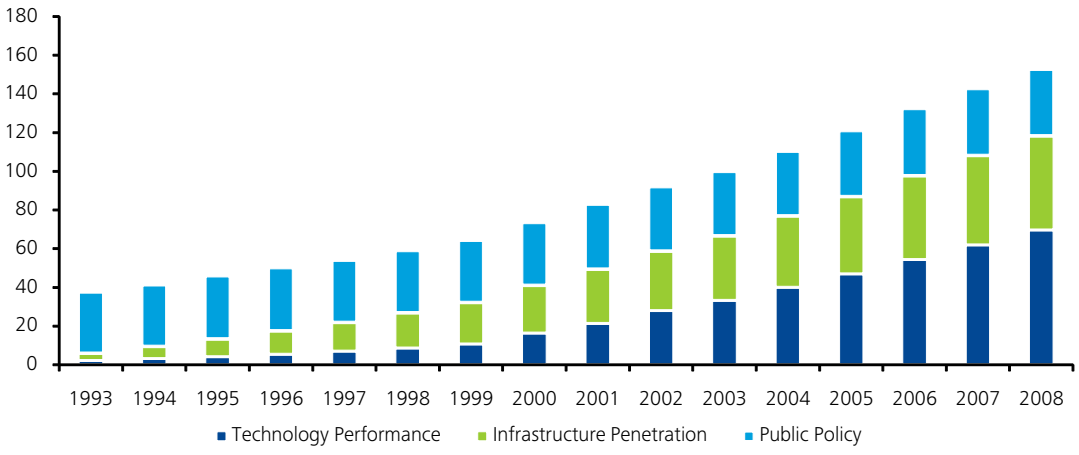
[5] For further information on how the Foundation Index is calculated, please refer to the Shift Index Methodology section.

We have built the Foundation Index around three key drivers, shown below and in Exhibit 11:

- **Technology Performance**
  Core digital performance trends that enable knowledge flows, creating pressures and opportunities for market participants. This driver consists of three metrics: Computing, Digital Storage, and Bandwidth.
- **Infrastructure Penetration**
  The adoption of innovative products and technologies brought on by the advances in the core digital infrastructure. This driver consists of two metrics: Internet Users and Wireless Subscriptions.
- **Public Policy**
  Technological advances and adoption rates can be either dampened or amplified by public policy initiatives; this driver represents the concept that the liberalization of economic policy removes barriers to the movement of ideas, capital, products, and people. It consists of one metric: Economic Freedom.

Consistent with its role as a leading indicator of the Big Shift, the Foundation Index has grown most rapidly over the last 15 years. This growth has primarily been driven by accelerating improvements in the performance of technology, represented by the Technology Performance driver, which has grown at a 26 percent CAGR since 1993 (Exhibit 12). The penetration of these technological infrastructures, represented by the Infrastructure Penetration driver, has also been increasing, albeit at a slower 19 percent CAGR (Exhibit 13), confirming that adoption of technology advances somewhat lags behind the rate of innovation.

Exhibit 11: Foundation Index drivers (1993-2008)



Source: Deloitte analysis

Exhibit 12: Technology Performance (1993-2008)

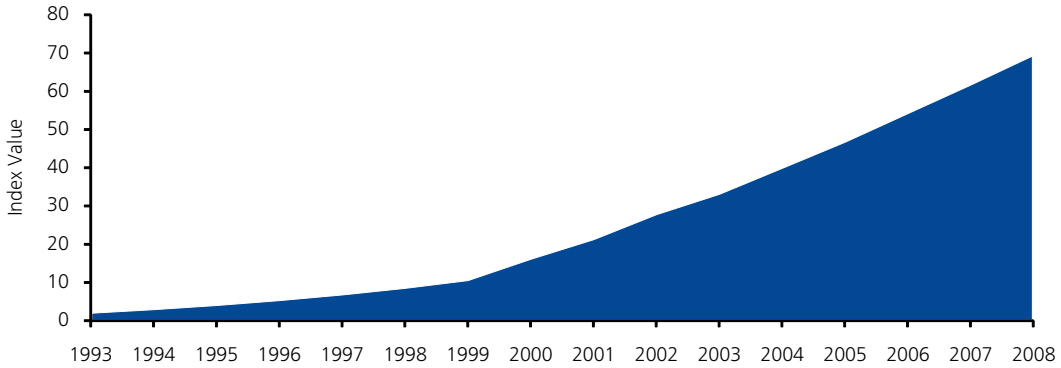


Exhibit 13: Infrastructure Penetration (1993-2008)

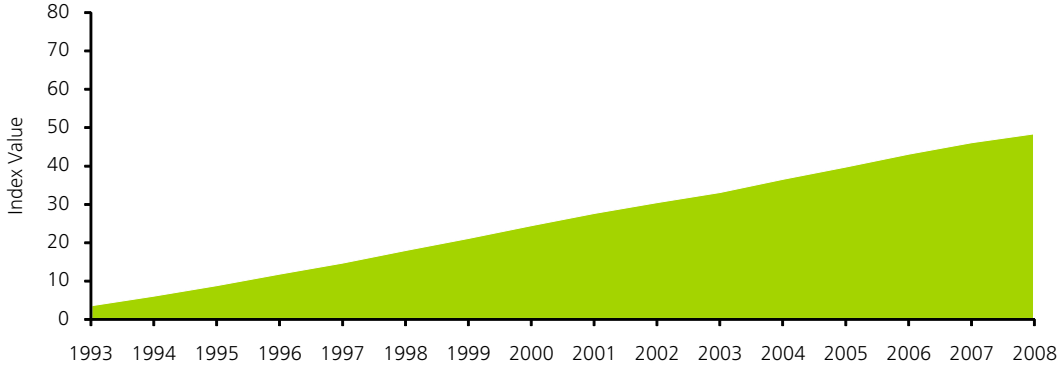
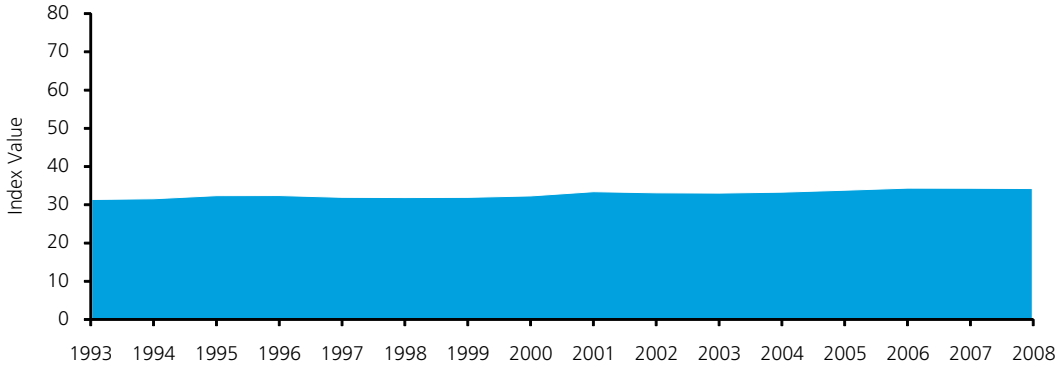


Exhibit 14: Public Policy (1993-2008)



Source: Deloitte analysis

The chart above represents the combined movements of the underlying metrics in the index, after data adjustments and indexing to a base year of 2003. For more information on the Index Creation process, see the Methodology section of the report.

As key technologies, such as the Internet, approach a saturation point, growth in the Infrastructure Penetration driver is expected to slow. However, advances in the technologies themselves are expected to continue at a rapid pace in the near future. This slowdown in adoption does not mean that participation in knowledge flows will slow or stop; on the contrary, saturation will indicate a robust installed base equipped to fully engage in knowledge flows. As the digital infrastructure continues to improve, users will be able to engage with it in new and innovative ways, further enhancing their abilities to connect and learn.

Public policy liberalization, measured by the degree of Economic Freedom, has remained at a very high level relative to the rest of the world but has improved only modestly in recent years, growing at a one percent CAGR (Exhibit 14).

Computing

As computing costs drop, the pace of innovation accelerates

Introduction

During the last 30 years, computing has gone through a number of transformations, moving from mainframe to client-server and, today, just starting to progress into the cloud. Driving these paradigm shifts has been a remarkably persistent exponential drop in computing cost/performance. The exponential decline in the cost of computing was described by Gordon Moore in a 1965 paper where he predicted the number of transistors on an integrated circuit would double every 24 months. More than 40 years later, Moore's Law has proved to be one of the most enduring technology predictions ever made. Today, the average smart-phone has more computing power than the original Apollo mission to the moon.

The remarkably persistent decrease in computing cost/performance is the result of ever-more R&D expense and capital investment by semiconductor vendors. Engineers work to shrink transistors down to the atomic level, material scientists explore the electrical properties of exotic materials used in chips, physicists employ quantum mechanics to build atomic computers, and process engineers improve manufacturing throughput and quality. Once the engineers and scientists have a working proof of concept for a new semiconductor design, equipment vendors invest billions of dollars creating the new manufacturing equipment required to produce the new semiconductor spec. These investments continue apace, even during recessions, as vendors look to position themselves for the resumption of economic growth.

Over time, the Shift Index will look for changes in computing performance or cost curves. That said, we expect this metric to be highly predictable. While the history of technology is rife with predictions that turned out to be wrong, the ability of human intelligence to constantly extend Moore's Law into a relevant future has persisted. Regarding the extensibility of Moore's Law, Moore said, "One of the principle ways we achieve this is by making things smaller and we're approaching the limit that materials are made of atoms. We're not too far away from that. But talking to the Intel technologists, they think they can still see reasonably clearly for the next four generations. That's further than I've ever been able to see. It's amazing how creative the people have been about getting around the apparent barriers that are going to limit the rate at which the technology can expand."[6] Beau Vrolyk, former executive at SGI and current Silicon Valley investor with deep expertise in digital systems agrees: "As device physics approaches a limit to Moore's Law, architecture innovations like multi-core and parallelism have allowed the industry to continue to provide significant advances in price/performance that resemble Gordon's projections."[7] We can assume that the cost performance of computing will continue to decline at its current trajectory for the foreseeable future and to add to the forces underlying the Big Shift.

Observations

As Exhibit 15 shows, the cost of one MM transistors has steadily dropped from over $222 dollars in 1992 to $0.27 in 2008, declining at a negative 34 percent CAGR. To put this into perspective, if previous technologies had advanced at the pace of semiconductors, a 200HP car would have achieved over 500,000 MPG by 1944.

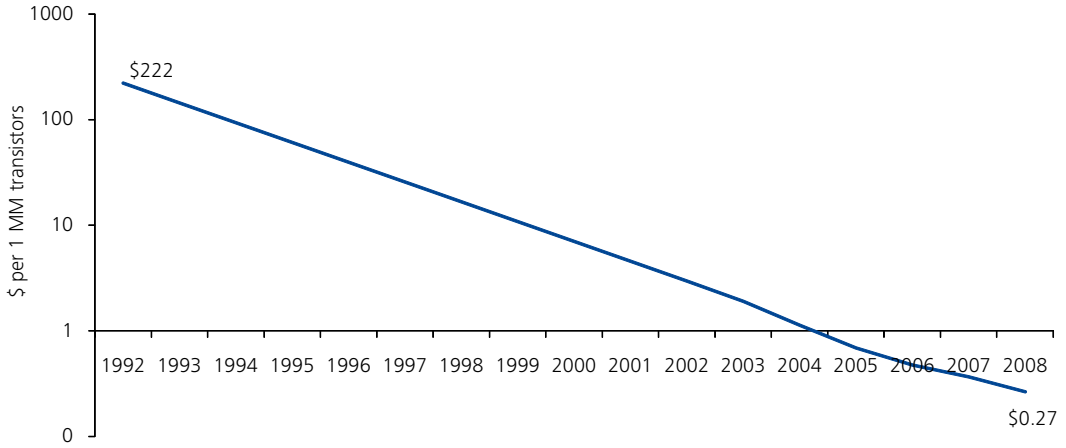
In order to keep extending Moore's Law way into the future, experts expect that silicon will be replaced by other substrates or that new forms of computing will have to emerge, such as quantum computing for specialized tasks. Physicist Stephen Hawking once responded to a question about the limits of computing by defining the fundamental limitations to microelectronics in terms of the speed of light and the atomic nature of matter.[8] In fact, the computing industry has consistently responded to computing limitations by exploiting the expansive possibilities suggested by the physical laws of nature.

[6] Gordon Moore, interview by Charlie Rose, Charlie Rose, PBS, November 14, 2005.

[7] Beau Vrolyk, email message to John Seely Brown, May 26, 2009.

[8] Brian Gardiner, "IDF: Gordon Moore Predicts End of Moore's Law (Again)," Wired, September 18, 2007, http://www.wired.com/epicenter/2007/09/idf-gordon-mo-1.

Exhibit 15: Computing Cost Performance (1992-2008)



Source: Leading technology research vendor

Even if there is a gap between silicon technology and whatever comes next, Moore points out that it will "not be the end of the world…You just make bigger chips."[9] This refers to the fact that semiconductors are built on wafers—thin slices of silicon crystal. Today, cutting-edge fabs manufacture 300mm wafers. The next step is 450mm wafers. Vendors have already agreed on a spec, and industry experts believe that new 450mm production fabs could come online in 2017-2019 at a staggering cost of $20-$40 billion to develop the new requisite manufacturing technology and bring it to market.[10] Moreover, additional cost savings are being achieved by increasing the surface area of wafers.

As computing power grows, today's highly complex problems in fields ranging from medical genetics to nanotechnology will become the simple building blocks of future innovation. And as computational power becomes ubiquitous and the playing field becomes increasingly flat, scale will become increasingly less important. Small moves, disproportionately made, will have disproportionate impact. Already today, we have seen two students from Stanford invent a search algorithm that forms the basis for hundreds of billions of dollars in economic value. We have seen small, far-flung groups using very expensive instruments—such as the electron scanning microscope—remotely on a time-share basis, which has effectively put material science back in the garage. What will increasing computational power bring next? One thing seems clear: Winners and losers will be separated only by the ability of talent and organizations to effectively harness the power of this processing capability to deliver new innovations to market.

[9] Quoted in Ed Sperling, "Gordon Moore on Moore's Law," Electronic News, September 19, 2007, http://www.electronicsnews.com.au/Article/Gordon-Moore-on-Moores-Law/74412.aspx.

[10] Dean Freeman, quoted in Mark LaPedus, "Industry Agrees on First 450-mm Wafer Standard," RF DesignLine, http://www.rfdesignline.com/news/211600047 (created October 22, 2008).

Digital Storage

Plummeting storage costs solve one problem—and create another

Introduction

Starting with the introduction of magnetic drum technology for early mainframe computers in 1955, storage has gone through a persistent transformation where cost/performance has decreased exponentially, making storage globally ubiquitous. These improvements in the cost/performance of storage are described by Kryder's Law, which predicts that capacity on a unit basis doubles every 12 to 18 months. And while Kryder's Law was devised as an observation after the fact, it has proved remarkably descriptive of the exponential trend in storage capacity, beginning in 1955. Today, more than 50 years since the application of magnetic storage to digital computing, users can store on a thumb drive what formerly took thousands of square feet of space.

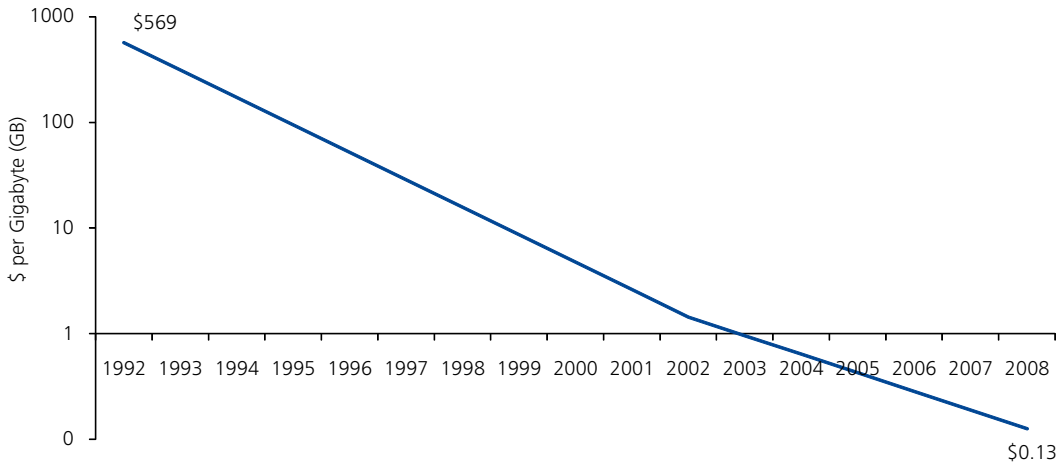
Over time, the Shift Index will look for changes in storage's performance or cost curves, but we expect this metric to be highly persistent over time. As a recent industry report pointed out, "While the devices and applications that create or capture digital information are growing rapidly, so are the devices that store information. Information creation and available storage are the yin and yang of the digital universe."[11]

Observations

During the past 16 years, the cost of one gigabyte (GB) of storage has been decreasing at an exponential rate from $569 in 1992 to $0.13 in 2008, as shown in Exhibit 16. To put this into perspective, Sukhinder Singh Cassidy, Google's vice president of Asia-Pacific and Latin America operations, observes, "Since 1982, the price of storage has dropped by a factor of 3.6 million … to put that in context, if gas prices fell by the same amount, today, a gallon of gas would take you around the earth 2,200 times."[12]

During this time, the compounding effects of technology innovation, competitive pressures, market demand, and

Exhibit 16: Storage Cost Performance (1992-2008)



Source: Leading technology research vendor

[11] John F. Ganz et al., The Diverse and Exploding Digital Universe (Framingham, MA: IDC, 2008), http://www.emc.com/collateral/analyst-reports/diverse-exploding-digital-universe.pdf.

[12] Quoted in Lynn Tan, "Cheap Storage Fueling Innovation," ZDNet Asia, http://www.zdnetasia.com/insight/specialreports/smb/storage/0,3800011754,62034356,00.htm (created November 13, 2007).

the substitute effect (storage as utility) drove costs down dramatically while contributing to exponential increases in performance.

Will performance continue? There is no consensus on how long IT technology innovation in storage will continue at its current pace. Yet insatiable market demand and constant advances and new innovations coming from a raft of new technologies including nanotechnology, 3D holographic storage, carbon nanotubes, and heat-assisted magnetic recording[13] suggest that the decrease in storage cost/performance will continue for the foreseeable future.

The rapid rise of storage, on the one hand, makes it easier to generate digital data without worrying about where to keep it. No political process is necessary to determine whether video of milk shooting from a teenager's nose is more or less worthy of storage than video of a CEO speaking at the Commonwealth Club in San Francisco. Both can be stored with little tradeoff. More broadly, the increase in storage capacity has enabled the boom in user-generated content, which has helped to lower information asymmetries between vendors and customers, who now have easier access to product price and quality information, much of it posted by their peers.

Solving the storage problem, however, creates a separate difficulty: the proliferation of digital data. As more and more videos, blogs, papers, comments, articles, advertisements, etc., clamor for our interest, our attention comes to be increasingly scarce. As we will discuss in the Flows Index, participating in and sampling streams of data, information, and, most particularly, knowledge, is increasingly important in the Big Shift. Doing so without the proper set of filters, however, makes it difficult to separate the valuable signal from the valueless noise.

[13] Burt Kaliski, "Global Research Collaboration at EMC Corporation," http://www.emc.com/leadership/tech-view/innovation-network.htm (updated 2009).

Bandwidth

As bandwidth costs drop, the world becomes flatter and more connected

Introduction

Today's modern digital network can be traced back to a Defense Department project in 1969, which was trying to solve the phone network's reliance on switching stations that could be destroyed in an attack, making it impossible to communicate. The solution was to build a "Web" that used dynamic routing protocols to constantly adjust the flow of traffic through the "net." This was the genesis of the Defense Advanced Research Projects Agency (DARPA) Internet Program. Today, 40 years later, the Internet has revolutionized the way people communicate. At the center of this revolution is the consistent exponential decrease in bandwidth cost/performance.

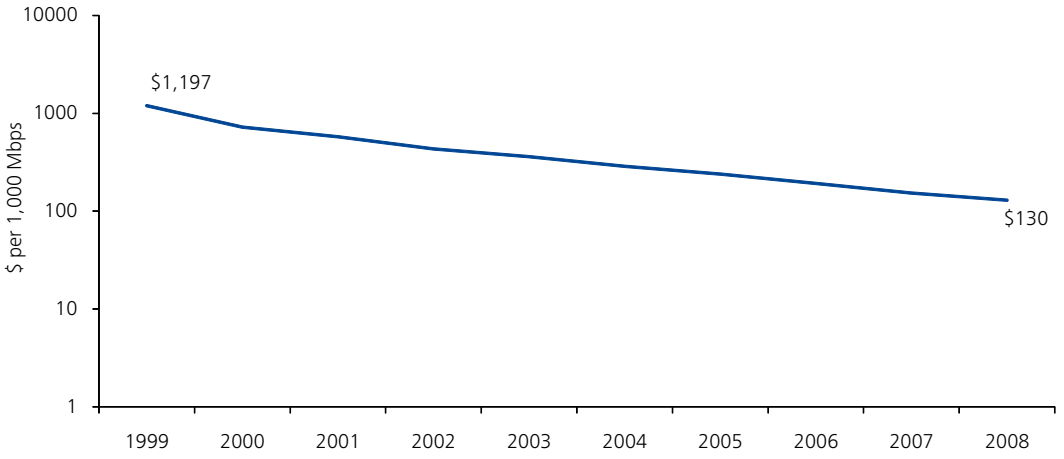
Given the impossibility of devising a single metric that measures bandwidth across the Internet, the Shift Index measures bandwidth cost/performance in the data center fiber channel.

Over time, the index will assess changes in bandwidth's performance or cost curves, but we expect growth of this metric to be fairly persistent. Why? First, improved bandwidth performance is enhanced by computational power that compresses content and effectively increases the capacity of the fiber. Second, the standard setting bodies and processes needed to help bandwidth technology grow have a strong history of success. Combined, these trends suggest that the bandwidth cost/performance curve will persist into the foreseeable future.

Observations

Like computing, the bandwidth cost/performance curve has persistently decreased over time. According to an analysis done by a leading technology research vendor,[14] the cost of 1,000 Mbps (megabits per second), which refers to data transfer speed, dropped 10 times from over $1,197 in 1999 to $130 in 2008.

Exhibit 17: Bandwidth Cost Performance (1999-2008)



Source: Leading technology research vendor

[14] For further information, please refer to the Shift Index Methodology section.

Exhibit 17 compares the cost of 1,000 Mbps over 10 years. The compound effects of technology innovation and better data standards improved performance, while vendor scale drove down costs contributing to exponential increases in bandwidth cost/performance.

Corning optical fiber scientists conclude that due to the decrease in bandwidth cost/performance ratio, fiber network "traffic is going up by 2.5X every two years and capacity is going up by 1.6X and this trend is likely to continue on this trajectory for the foreseeable future."[15] This assessment implies that bandwidth cost/performance trends are also likely to continue in the future.

As bandwidth cost decreases, the world becomes flatter and more connected. Bandwidth cost performance allows for cheap and reliable connectivity and, thus, acts as a great equalizer by increasing the number of market participants. At the same time, as bandwidth cost/performance continues to improve, it becomes highly disruptive. Optical fiber into the home, for example, threatens video rentals. Cable and digital television face the threat of disintermediation in an age where bandwidth has enabled 70,000,000 videos to be uploaded onto YouTube with 13 hours of new content being added every minute.[16] More broadly, when businesses are able to integrate data with talent wherever it resides, firms in every industry become freer from the constraints of time and space.

As the benefits of bandwidth cost performance reach more people, the world is becoming a smaller place. Strategies relying on the distance between competitors—big fixed asset plays, for instance, or attempts to limit customer access to information—are becoming considerably weaker.

[15] Bob Tkach, the 2008 Tindall Award winner and director of Transmission Systems and Network Research at Alcatel-Lucent and Corning SMEs.

[16] Adam Singer, "49 Amazing Social Media, Web 2.0 and Internet Stats," The Future Buzz, http://thefuturebuzz.com/2009/01/12/social-media-web-20-Internet-numbers-stats (created January 12, 2009).

Internet Users

Accelerating Internet adoption makes digital technology more accessible, increasing pressure as well as creating opportunity

Introduction

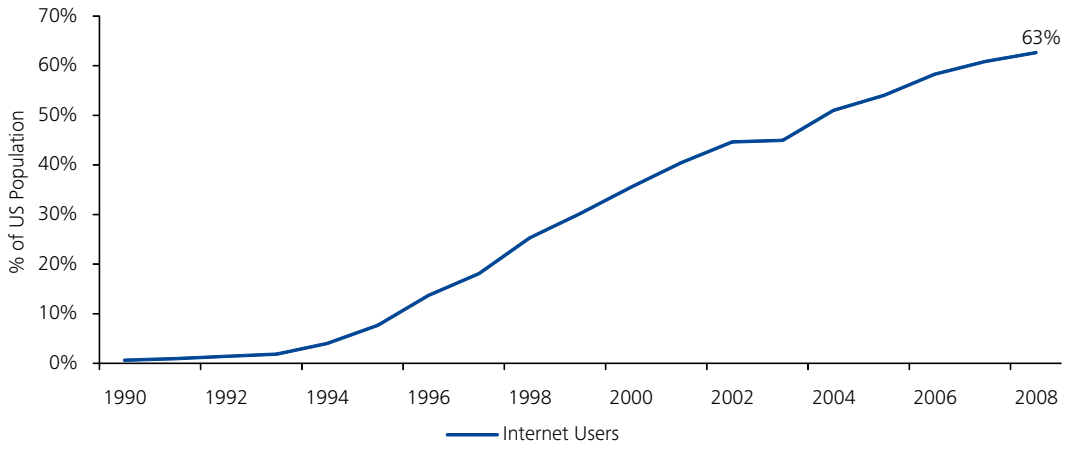
More than any other single metric, the growth rate in the percentage of people actively using the Internet represents the speed at which the evolving digital infrastructure is being adopted. That is because the Internet is itself the sum total of all the functionality underlying it—advances in reliable broadband and mobile Internet infrastructure, for instance, the vast "server farms" that support search engines, and the countless Internet applications that run on browsers. The significance of the Internet also stems from the instant access it provides users to the breadth of information and resources needed to fuel innovation, collaboration, and efficiency.

comScore's State of the Internet Report was the basis of the data for this metric.[17] comScore defines active "Internet Users" as persons using the Internet more than once during the month-long period in which they are surveyed. Data for personal computer (PC) and mobile Internet users were provided in this report, but only the PC Internet user figures were incorporated into the Index given the very high overlap of mobile and PC Internet users in the United States. The overall usage figures were normalized against the U.S. population to provide a penetration value for this installed base.

Observations

As of December 2008, approximately 63 percent of all U.S. citizens (191 million) were actively using the Internet. Over the past 18 years, Internet users as a percentage of the U.S. population has shown strong growth, from one percent in 1990 to 63 percent in 2008, as shown in Exhibit 18.

Exhibit 18: Internet Users (1990-2008)



Source: comScore, Deloitte analysis

[17] For further information, please refer to the Shift Index Methodology section.

To put these numbers in context, consider Exhibit 19, which shows that it took less time for the Internet to penetrate 50 percent of U.S. households than any other technology in history. The adoption rate for the Internet is twice what it was for electricity, and it penetrated 50 percent of households in nine years, whereas it took the telephone, electricity, and the computer 46, 19, and 17 years, respectively, to reach the same milestone.[18]

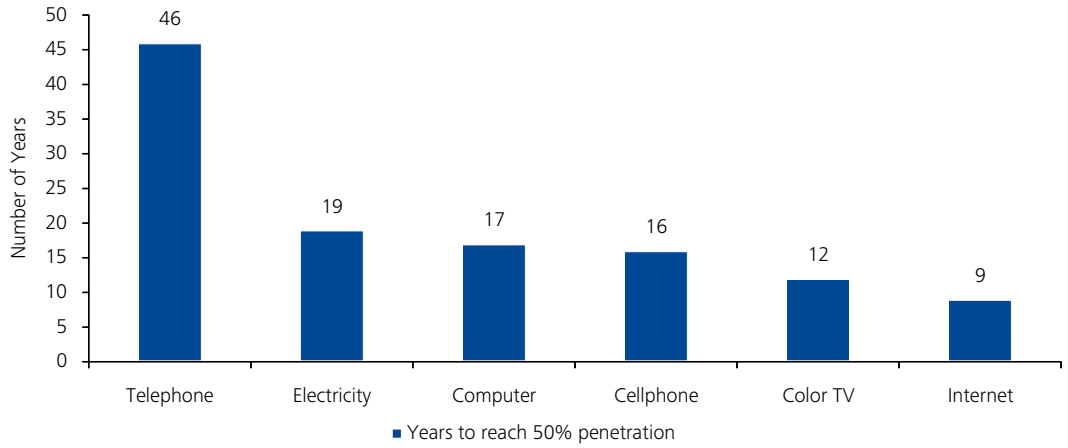
One of the drivers for Internet user growth has been the constant technology cost performance improvement discussed in the previous section. Internet access and PCs have become increasingly affordable, making it possible for more and more people to get online. For example, IDC reports that the average system price for PCs fell from $1,699 in 1999, to $934 in 2008.[19]

Mobile Internet users are also gaining critical mass. Technological improvements such as 3G, signifying the third-generation of wireless networks, and advances in Smartphone and netbook device capabilities have allowed for on-the-go remote Internet access. An example of this trend is the Apple iPhone and iPod Touch products, which have sold over 30 million units to date, and with them, over one billion downloads from the Apple App Store.[20] Exhibit 20 reflects these trends in the number of mobile Internet users growing from 12 percent to 18 percent of the U.S. population in the past year—a 49 percent increase.

The demographic profile of the mobile Internet audience skews toward younger users and provides a hint of the future. According to a recent study, when given a choice of consumer electronic devices, boomer Internet users (45 +) overwhelmingly chose PCs over mobile phones (51 percent and 21 percent, respectively), while the opposite was true for Gen Y (18-24) (47 percent and 38 percent, respectively).[21] We are at the beginning of a trend toward mobility, accessibility, and convergence of the physical and virtual.

Over time, as access becomes even more widespread and services continue to improve, the Internet will increasingly become a dominant medium for the knowledge flows that are central to economic value creation. Consider how LinkedIn, Facebook, and Twitter enable individuals to post news articles, videos, photos, white papers, and other media to audiences of followers, friends, and professional colleagues. Or how the German software maker SAP used the Internet to create a virtual platform in which customers, developers, system integrators, and service vendors could create and exchange knowledge, thus increasing the productivity of all the participants in its ecosystem. The relatively low cost and nearly instantaneous sharing of ideas, knowledge, and skills facilitated by the Internet is making collaborative work considerably easier.

Exhibit 19: Technology adoption - U.S. households



Source: Deloitte analysis

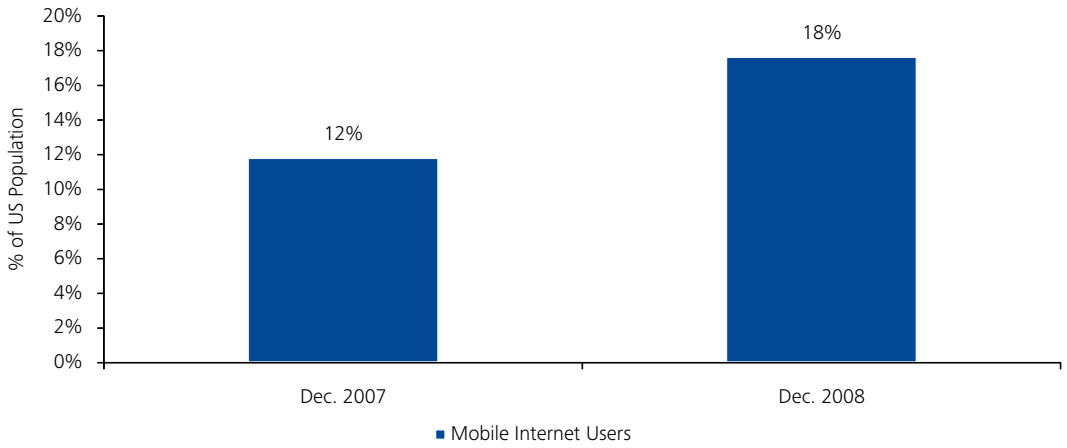
[18] "Consumption Spreads Faster Today," New York Times, http://www.nytimes.com/imagepages/2008/02/10/opinion/10op.graphic.ready.html (updated 2008), Deloitte analysis.

[19] "Introducing the New Standard & Poor's NetAdvantage," Standard & Poor's, http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/showIndustrySurvey.do?code=coh (updated 2009).

[20] ""Apple's Revolutionary App Store Downloads Top One Billion in Just Nine Months". Apple. April 24, 2009 <http://www.apple.com/pr/library/2009/04/24appstore.html>; "Apple Previews Developer Beta of iPhone OS 3.0". Apple. March 17, 2009 <http://www.apple.com/pr/library/2009/03/17iphone.html >.

[21] Accenture 'Get Ready: Digital Lifestyle 3.0' report in late 2008.

Exhibit 20: Mobile Internet Users (2007-2008)



Source: comScore, Deloitte analysis

Internet behavior trends suggest that users are paving the way in terms of how information sharing is utilized. comScore's State of the Internet Report in January 2009 provides a snapshot of some recent statistics regarding Internet user behavior: The average user was online 20 days in the month, for a total of 31.1 hours, and viewed 2,668 pages. Of the total time spent online, 22 percent was spent at communications sites. Users spent an average of 6.3 hours with email and 5.1 hours on instant messaging alone, 77 percent of Internet visitors viewed an online video in the United States, and 93 percent of Internet visitors conducted at least one search. The average searcher conducted 100 searches in one month. The total online spending in January 2009 at U.S. sites was $17.6 billion, up two percent from January 2008. Travel accounted for $6.7 billion, or 38 percent of total online spending in January.[22] Around the clock, Internet users are finding diverse ways to connect and share information.

Societal trends and advances to the digital infrastructure are constantly fostering new ways for users to engage with the Internet—and with each other via the Internet. For instance, online games, such World of Warcraft, and other game systems will continue to drive growth in Internet users. Additionally, online music platforms such as Apple's iTunes music store have helped to fuel the Internet's growth.

Internet-enabled collaboration has changed the game during the past 20 years or so for scientific research, software development, conference planning, political activism, and fiction writing, to name just a few. We will continue to keep a close eye on how these changes bring utility and value to both customers and businesses over time. Being aware of the latest trends and determining how to best leverage the creativity and collaboration of Internet users will be key to a constantly changing future.

[22] comScore Media Metrix, January 2009; comScore qSearch, January 2009; e-Commerce Reports, January 2009.

Wireless Subscriptions

Wireless advances provide continual connectivity for knowledge exchanges

Introduction

Growth in wireless subscriptions is another key metric indicating adoption of digital infrastructure. As more and more people connect wirelessly, this network of devices and people creates a platform for broad, robust knowledge flows and increased connectivity among individuals and institutions.

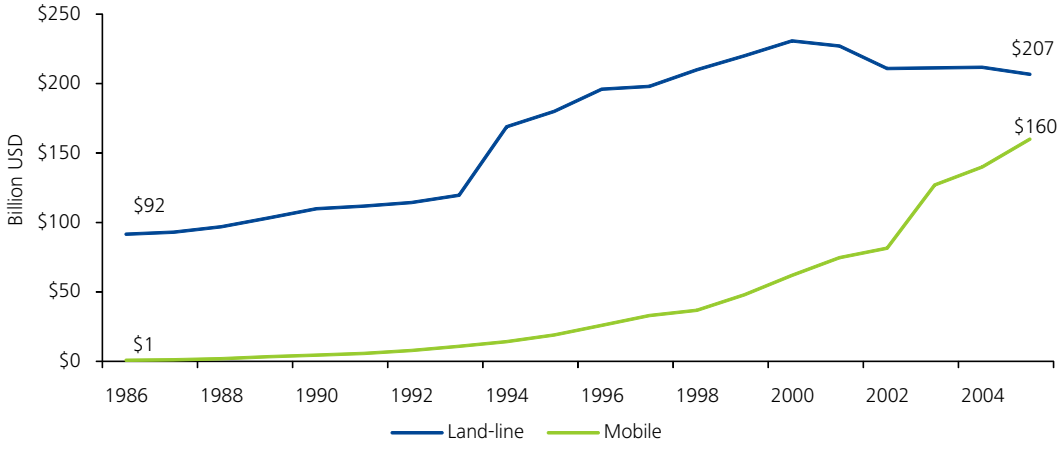
This metric captures the number of active wireless subscriptions as a percentage of the U.S. population based on CTIA's *Wireless Subscriber Usage Report*.[23] Even now, consumers commonly have more than one wireless phone. For that reason, this metric captures wireless subscriptions rather than wireless subscribers.

Consumers are becoming increasingly dependent on mobile phones to meet their communication needs. In fact, more and more consumers are disconnecting their landline services altogether and relying solely on their cell phones for voice communication and messaging. This dynamic is revealed in revenue trends for fixed and mobile communication services, shown in Exhibit 21.

Observations

As shown in Exhibit 21, between 1986 and 2005, revenues from mobile telephone services grew faster than those from fixed line services. In that time period, wireless revenues grew at a 32 percent CAGR, whereas revenues from fixed lines grew at only four percent CAGR. Moreover, within the last five years, fixed line service revenues declined, while revenues from wireless services continued to increase. As fixed line communication seems to have reached a saturation point, this metric focuses on wireless communication to help assess digital technology penetration.

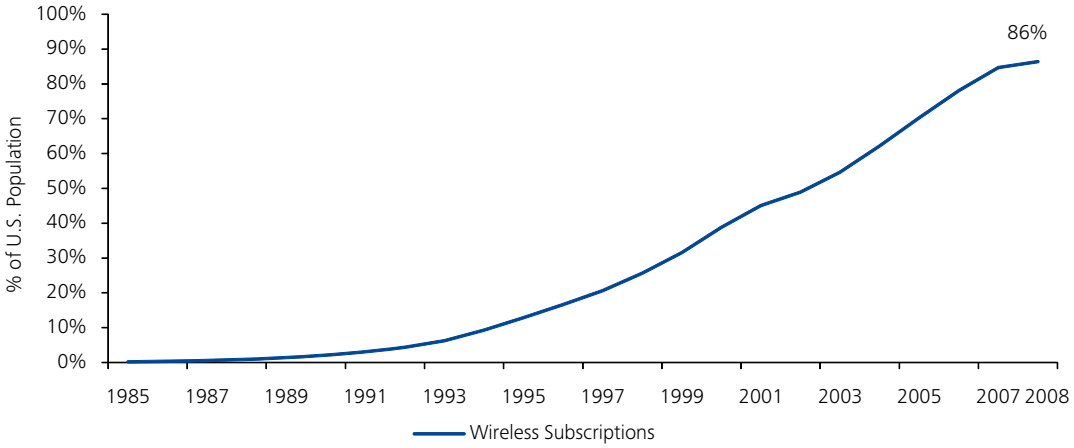
Exhibit 21: Telephone service revenue (1986-2005)



Source: International Telecommunications Union, Deloitte analysis

[23] For further information, please refer to the Shift Index Methodology section.

Exhibit 22: Wireless subscriptions (1985-2008)



Source: CTIA, Deloitte analysis

Exhibit 22 demonstrates the growth of wireless subscriptions as a percentage of the U.S. population. During the past 23 years, wireless subscriptions have grown from being one percent of the population in 1985 to 86 percent in 2008, at a 32 percent CAGR. In absolute terms, the numbers are striking. In 1985, there were an estimated 340,000 wireless subscriptions. These grew to approximately 270 million by the end of 2008.

Together with Internet Users, Wireless Subscriptions represent the adoption of digital infrastructure, enabling two- and multi-way communication and the ability to share data, information, and knowledge from nearly any geographic location. As evidenced by increasingly high penetration rates, people now have the ability to participate in knowledge flows anytime and anywhere, putting information literally at their fingertips.

Wireless devices enable remote access to the Internet, allowing for scalable connectivity. People can email, read news, listen to music, talk, SMS, and engage in social media on the go, which make tapping into knowledge flows and connecting to a large network simple yet powerful.

Moreover, as the functionality of wireless devices grows, some observers speculate that voice recognition may become the equivalent of today's graphical user interface (GUI), paving the way for new user practices and voice applications to support them. The digital technology that allows for this ubiquitous connectivity has created a seemingly invisible infrastructure, where the lines between the virtual and physical world are blurred.

The widespread adoption of wireless technology has scaled connectivity and enhanced people's ability to interact with one another. For instance, with GPS wireless technology, people can connect not only virtually but also physically, which adds to the richness of the connections.

For business leaders, this has a profound effect on opening up new markets, revealing new business models and reaching parts of the world that would otherwise be left untouched.

Economic Freedom

Increasing economic freedom not only intensifies competition but also enhances the ability to compete and collaborate

Introduction

Changes in public policy also play a foundational role in the Big Shift. Broadly speaking, and some recent regulatory developments notwithstanding, policy trends toward economic liberalization on a global scale are systematically driving down barriers to the movement of products, money, people, and ideas, both within countries and across national borders. This, in turn, intensifies competition, putting pressure on margins and raising the rate at which companies lose their leadership positions.

To best measure these public policy changes, the Shift Index uses the 2009 Index of Economic Freedom produced by the Heritage Foundation and co-published with *The Wall Street Journal*[24]. They have defined economic freedom as the

> *fundamental right of every human to control his or her own labor and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please, with that freedom both protected by the state and unconstrained by the state. In economically free societies, governments allow labor, capital and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself.*

The Economic Freedom metric leverages all 10 freedom components included in the Heritage Foundation's Index:

- **Business Freedom**
  The ability to start, operate, and close businesses, which represents the overall burden of regulations and regulatory efficiency.
- **Fiscal Freedom**
  A measure of the burden of government from the revenue side (e.g., individual and corporate top tax rates and tax revenue as a percentage of GDP).
- **Monetary Freedom**
  A measure of price stability along with an assessment of price controls.
- **Investment Freedom**
  An assessment of each country's investment climate, made from an analysis of their policies toward the free flow of investment capital (foreign and internal).
- **Labor Freedom**
  A quantitative measure that takes into consideration various aspects of the legal and regulatory framework of a country's labor market.
- **Trade Freedom**
  A composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services.
- **Government Size**
  A measure of government expenditures as a percentage of GDP.
- **Property Rights**
  An assessment of the ability of individuals to accumulate private property, secured by clear and enforced laws.
- **Freedom from Corruption**
  A measurement derived from Transparency International's Corruption Perception Index (CPI).
- **Financial Freedom**
  A measure of banking security and of independence from government control.

The Economic Freedom metric is a proxy for openness of public policy. As economic freedom rises, a country can be perceived to have more open public policies, further catalyzing and accelerating foundational changes of the Big Shift.

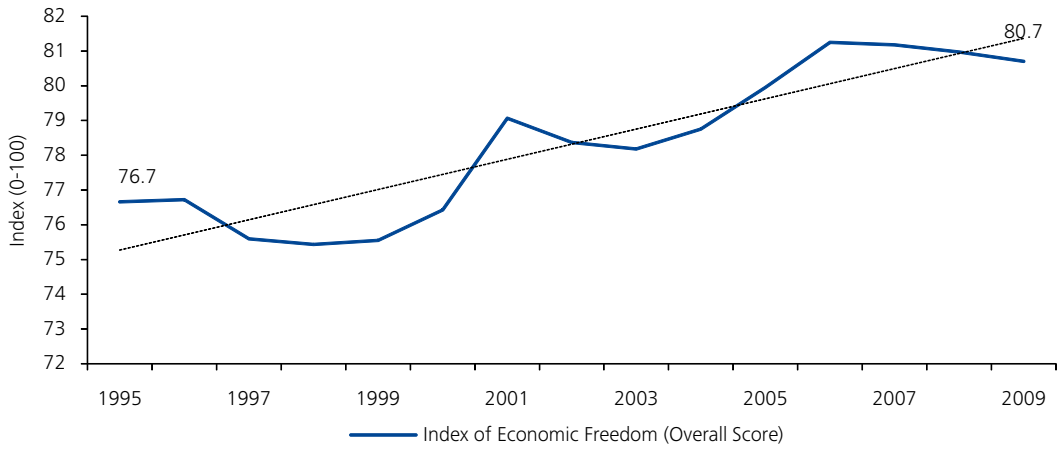
[24] The 2009 *Index of Economic Freedom*, The Heritage Foundation and Dow Jones & Company, Inc., http://www.heritage.org/Index (created January 13, 2009).

Observations

The United States, in 2009, received a score of 80.7 out of 100, ranking 6th out of 179 countries and receiving the classification of "free." Being classified as "free" reflects a number of notable socioeconomic advantages that help accelerate elements of the Big Shift. To explore the relationship between these advantages and the metrics used in the Shift Index, we conducted a basic quantitative exercise (see the Shift Index Methodology section) designed to identify the strength of these relationships and the subsequent correlation or degree of linear dependence between them.[25]

- The *2009 Index of Economic Freedom* shows that citizens in "free" economies enjoy longer lives, better education, and standards of living.[26] Our analysis finds high quantitative correlation between these advantages and higher Returns to Talent, a metric in our Flow Index.
- The *2009 Index of Economic Freedom* illustrates that citizens in "free" economies enjoy broader choice and control over their lives. Our analysis finds high quantitative correlation between these advantages and Travel Volume, Returns to Talent, and a conceptual relationship with Consumer Power.

Exhibit 23: Index of Economic Freedom (1995-2009)



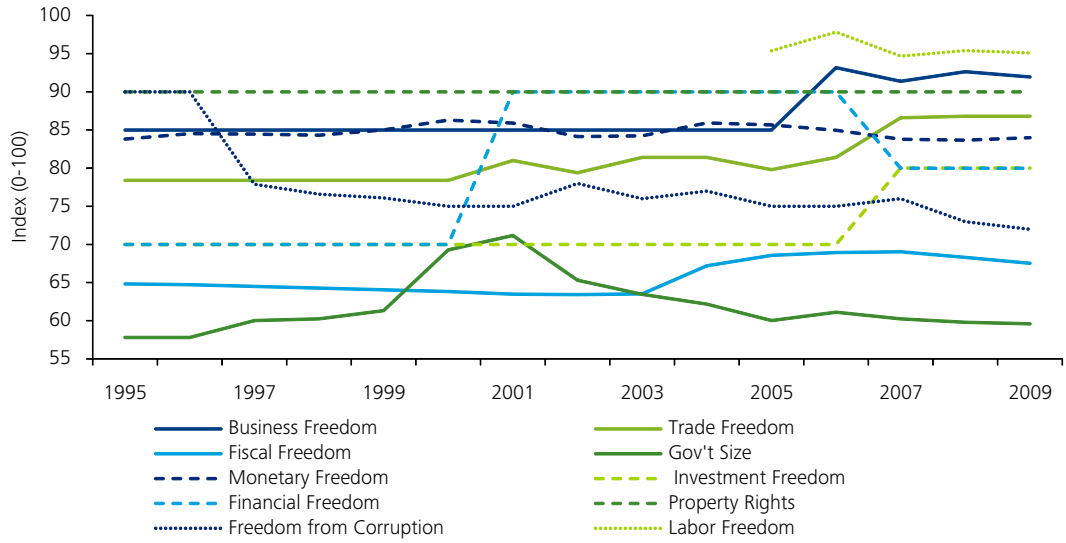
Source: Heritage Foundation's **2009 Index of Economic Freedom, Deloitte analysis**

[25] The correlation is 1 in the case of an increasing linear relationship, –1 in the case of a decreasing linear relationship, and some value in between in all other cases, indicating the degree of linear dependence between the variables. The closer the coefficient is to either –1 or 1, the stronger the correlation between the variables.

[26] Higher economic freedom is correlated with overall improved human development: UN Development Index and the Heritage Foundation *2009 Index of Economic Freedom* analysis.

[27] Higher economic freedom and democratic governance are interrelated: Economist Intelligence Unit's Index of Democracy and the Heritage Foundation *2009 Index of Economic Freedom* analysis

Exhibit 24: Sub-components - Index of Economic Freedom (1995-2009)



Source: Heritage Foundation's **2009 Index of Economic Freedom**

How has U.S. economic freedom trended? Exhibit 23 shows that U.S. economic freedom has shown an upward secular trend since 1995 to 2008, increasing five percent over that same period. What drives the high ranking? Evaluating the contribution of each component historically (in terms of their percentage increases), we learn that since 1995 the index has been driven primarily by the following, shown in Exhibit 24:

- Investment freedom (a 14 percent increase)
- Financial freedom (a 14 percent increase)
- Trade freedom (an 11 percent increase)
- Business freedom (an eight percent increase)

The *2009 Index of Economic Freedom* indicates that the United States scored above the world average in all but government size and fiscal freedom. Labor freedom and business freedom scored the highest of all components at 95.4 and 91.9, respectively—playing a vital role in removing barriers to entry and a particularly strong role in securing a ranking of 6th out of 179 countries.

Our analysis demonstrates that open labor markets enhance overall employment and productivity growth and found a statistically significant positive correlation between labor freedom and Migration of People to Creative Cities, Travel Volume, and Labor Productivity. The higher the freedom, in other words, translates to greater productivity and the more travel and migration.

Open labor markets facilitate the ability to pursue jobs of choice and to congregate in geographic concentrations of talent, or "spikes," like Silicon Valley and Boston. Our case research shows that these spikes provide enhanced opportunity for rich and serendipitous connections that help to accelerate talent development and improve productivity. Additionally, we expect that workers who are free to select jobs of choice will be more passionate about their work and eventually more productive.

With a score of 91.9, business freedom was the second-highest rated component for the United States, in 2009. Our analysis illustrates a strong positive correlation between business freedom, competitive intensity, and GDP. The greater the freedom, the more competitive the environment and the greater the overall economic output of the country.

The U.S. regulatory environment protects the freedom to start a business, which lowers barriers to entry and facilitates rich entrepreneurial activity. According to the Heritage Foundation's report and the World Bank's *Doing Business* study,[28] starting a business in the United States takes six days, compared to the world average of 38, and obtaining a business license in the United States takes much less than the world average of 18 procedures and 225 days. The United States also has some of the most straightforward bankruptcy proceedings in the world, making it relatively easy to opt for bankruptcy, which may encourage more businesses to take the calculated risks that can spur greater innovation and increased competition.

Compared to other countries, the labor, financial, and business markets in the United States are some of the most open and modern in the world, resulting in the intensifying competition and disruption we have measured.

We should note that, while there is no prospect for a near-term leveling of digital technology performance trends, as indicated earlier in our foundation metrics, liberalizing public policy trends are much less certain moving forward. The current economic turmoil in world markets creates the very real potential for a public policy backlash, driving large parts of the world to erect protectionist barriers. While certainly possible, a move to protectionist public policies would be difficult to sustain unless large parts of the world followed suit.

[28] Doing Business 2009, World Bank Group, http://www.doingbusiness.org/s/?economyid=197 (updated 2009).

2009 Flow Index

46 **Inter-Firm Knowledge Flows:** Individuals are finding new ways to reach beyond the four walls of their organization to participate in diverse knowledge flows

51 **Wireless Activity:** More diverse communication options are increasing wireless usage and significantly increasing the scalability of connections

54 **Internet Activity:** The rapid growth of Internet activity reflects both broader availability and richer opportunities for connection with a growing range of people and resources

58 **Migration of People to Creative Cities:** Increasing migration suggests virtual connection is not enough—people increasingly seek rich and serendipitous face-to-face encounters as well

63 **Travel Volume:** Travel volume continues to grow as virtual connectivity expands, indicating that these may not be substitutes but complements

65 **Movement of Capital:** Capital flows are an important means not just to improve efficiency but also to access pockets of innovation globally

70 **Worker Passion:** Workers who are passionate about their jobs are more likely to participate in knowledge flows and generate value for companies

75 **Social Media Activity:** The recent burst of social media activity has enabled richer and more scalable ways to connect with people and build sustaining relationships that enhance knowledge flows

2009 Flow Index

139

Sources of economic value are moving from "stocks" of knowledge to "flows" of new knowledge

Remote communications today are easier than ever. Wireless connectivity and Internet access are virtually ubiquitous in the United States, and there is rarely a moment today that we are not connected to the rest of the world. What may seem commonplace today was a luxury little less than two decades ago. As the digital infrastructure penetrates ever-more deeply into the social and economic domains, practices from personal connectivity are bleeding over into professional connectivity: Institutional boundaries are becoming increasingly permeable as employees harness the tools they have adopted in their personal lives to enhance their professional productivity, often without the knowledge, and sometimes despite the opposition, of their employers.

With the Flow Index, we measure the changes in social and working practices that are emerging in response to the new digital infrastructure. More and more people are adopting practices that utilize the power of the digital infrastructure to create and participate in knowledge flows. Our approach to measuring these knowledge flows includes measuring flows of capital, talent, and knowledge across geographic and institutional boundaries.

The Flow Index measures Virtual Flows, Physical Flows, and Flow Amplifiers. Virtual Flows occur as a direct result a strong digital infrastructure. As computing, digital storage, and bandwidth performance improve exponentially, virtual flows are likely to grow more rapidly than the other drivers of the Flow Index. However, Physical Flows will not be fully replaced by Virtual Flows. As people become more and more connected virtually, the importance of tacit knowledge exchange through physical, face-to-face interactions will only increase, leading to more physical flows. Both Virtual and Physical Flows are enriched by Flow Amplifiers. These amplifiers enhance the robustness of both kinds of flows, making them even more meaningful.

Some of the findings from our inaugural research are given below:

- Talent migrates to the most vibrant geographies and institutions because that is where it can improve its performance more rapidly by learning faster. Our analysis shows that the most creative cities tend to grow much faster than the least creative cities; in fact, between 1990 and 2008, the top 10 creative cities grew more than twice as fast as the bottom 10. This migration to creative cities is not only beneficial for the cities and their economic livelihood; it also correlates with an increase in Returns to Talent. By better understanding the drivers of the disproportionate growth in creative cities, business leaders can create organizations that mimic the environment that makes those cities so creative.
- Companies appear to have difficulty holding onto passionate workers. Workers who are passionate about their jobs are more likely to participate in knowledge flows and generate value for their companies—on average, the more passionate participate twice as much as the disengaged in nearly all the knowledge flows activities surveyed. We also found that self-employed people are more than twice as likely to be passionate about their work as those who work for firms. The current evolution in employee mind-set and shifts in the talent marketplace require new rules on managing and retaining talent.
- Knowledge flows across companies are currently in their infancy. But our survey-based research indicates that increased interest and participation in new types on knowledge flows available through the current digital revolution, such as participation in social media and use of Internet knowledge management tools, will drive a marked increase in knowledge flows across firm boundaries. Of the people that currently use social media to connect to other professionals in other firms, 60 percent claimed they are participating more heavily

in this activity than last year. With only 33 percent of those surveyed currently participating in social media in the professional sphere across firms, this will likely drive significant growth in knowledge flows in coming years. This assumption is also supported by our research on the growth of social media platforms: Between 2007 and 2008, the total minutes spent on social media sites increased 40 percent. Moreover, the average daily visitors to social media sites grew to 62 million in 2008, up 49 percent year over year from 42 million in 2007.

- Residents of the United States travel more and more each year. And as people's movement increases, Big Shift forces are amplified, and opportunities for rich and serendipitous connections are more likely. Travel within the United States has increased 66 percent over the past 18 years. This rise in travel also correlates with labor productivity, suggesting that the amount people travel can directly affect the way they work. One plausible explanation for this is that people benefit in multiple ways from the physical interactions that are more likely as a result of higher travel volume. Face-to-face interactions will always play a role in promoting productive and trust-based business relationships. By better understanding the role travel plays in a Big Shift world, business leaders can more strategically consider the trade-offs when making decisions about travel.
- Historically, foreign direct investment (FDI) has been viewed as a way to improve efficiency, obtain resources, participate in labor arbitrage, and enjoy privileged access to local markets, which often favors local manufacturers. However, increasingly, firms are taking a more strategic long-term view by approaching FDI opportunities as ways to identify and access pockets of talent and innovation across the globe. U.S. FDI flows (both inflows and outflows) have increased steadily over the past few decades, with capital movement in 1970 being only two percent of what it is today.
- Wireless activity (mobile phone usage in minutes talked and SMS sent) and Internet activity continue to grow exponentially. Ten years ago, the average user spent 64 minutes per month on his or her mobile phone; today, the average user spends 370 minutes. SMS text messages, which are a more recent phenomenon, have shown similar growth: In the last five years, the average user went from sending less than one text message per month to sending 25. On the Internet, traffic across the 20 highest-capacity routes has grown 47 percent in the past year. The on-demand rich media experiences offered by the ever-improving modes of virtual communications will continue to shape how we interact with the world, both personally and professionally.

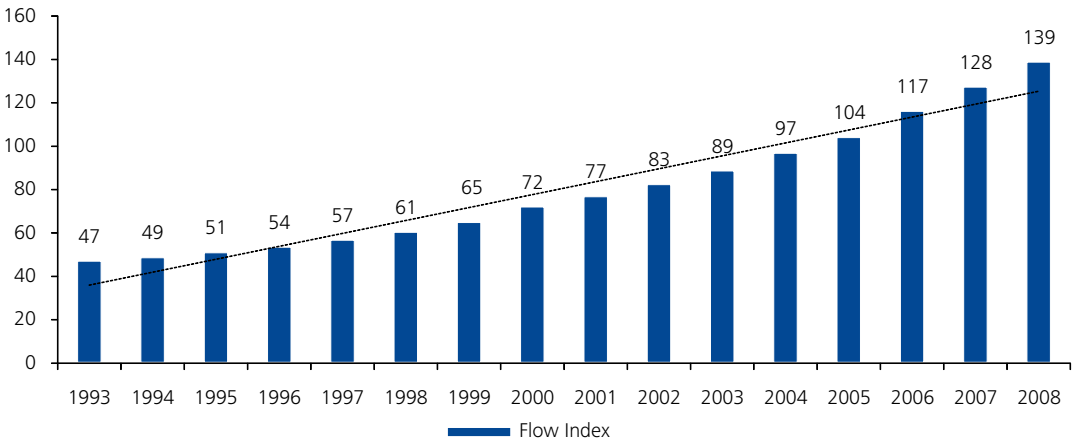
Taking a step back, we can see the interrelated nature of many of the foundation and flow metrics discussed in this report. The results of our research have shown that as economic freedom increases, people are freer to take control over their careers and lives. This leads to an increased likelihood of mobility and a profound increase in population growth within creative cities. These epicenters of creativity, with a high concentration of talent, have helped to propel recent growth in GDP and power much of the increase in productivity. We attribute this in part to the increased opportunity for rich and serendipitous encounters.

The Index

The Flow Index, shown in Exhibit 25, has a 2008 score of 139 and has increased at a seven percent CAGR since 1993.[29] The Flow Index measures the velocity and magnitude of knowledge flows resulting from the adoption of practices that take advantage of the advances in digital infrastructure and public policy liberalization.

[29] For further information on how the Flow Index is calculated, please see the Shift Index Methodology section. Note that because several metrics in the Flow Index are indexed to 2008 due to limited data availability, the value in 2003 (the base year) does not equal 100.

Exhibit 25: Flow Index (1993-2008)



Source: Deloitte analysis

The metrics in the Flows Index capture physical and virtual flows as well as elements that can amplify a flow—examples of these "amplifiers" include social media use and the degree of passion with which employees are engaged with their jobs. Given the slower rate with which social and professional practices change relative to the digital infrastructure, this index will likely serve as a lagging indicator of the Big Shift, trailing behind the Foundational Index. As such, we track the degree of lag over time.

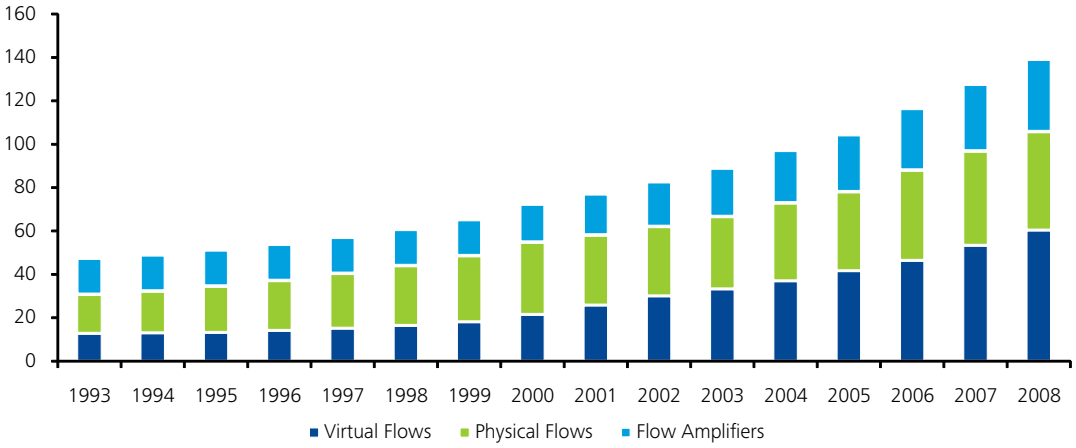
Eight metrics within three key drivers are included in the Flow Index:

- **Virtual Flows**
  Knowledge flows enabled by advancing digital infrastructure and its impact on increasing virtual connections. This driver consists of three metrics: Inter-Firm Knowledge Flows, Wireless Activity, and Internet Activity.
- **Physical Flows**
  Knowledge flows enabled by the movement of people and capital, strengthening virtual connections with physical interaction. This driver consists of three metrics: Migration of People to Creative Cities, Travel Volume, and Movement of Capital.
- **Flow Amplifiers**
  Knowledge flows amplified and enriched as people's passion for their profession increases and technological capabilities for collaboration improve. This driver consists of two metrics: Worker Passion and Social Media Activity.

Historically, the Flow Index has grown at an increasing rate, reflecting faster and faster growth in its underlying metrics.

Exhibit 26 shows the contribution of each metric to the overall index value, and Exhibits 27 through 29 show the growth of each index driver. Comparing the three, it is evident that the Virtual Flows and Amplifiers have been driving the increasing rate of the change of the Flow Index.

Exhibit 26: Flow Index drivers (1993-2008)



Source: Deloitte analysis

As shown in Exhibit 27, Virtual Flows have grown at a consistently accelerating pace with an overall CAGR of 11 percent. This has been powered by the exponential growth of wireless and Internet activity. We expect this trend to continue if not accelerate, as the above metrics continue growing exponentially, and knowledge flows between companies start increasing exponentially as well. In contrast, Physical Flows, as shown in Exhibit 28, have grown fairly linearly, with a CAGR of six percent. We expect this trend to continue at a steady pace, reflecting the long-term secular trends in capital flows, migration of people to creative cities, and travel.

Exhibit 29 depicts Flow Amplifiers, which were flat initially but started growing near the millennium; this is a function of both the metrics and the methodology. The initial period reflects the two metrics in this category (Worker Passion and Social Media Activity) both being relatively new (one is based on a custom survey, and the other represents a recent phenomenon). With no prior data for Worker Passion, we assumed a flat trend for passion for the past years using job satisfaction trends as a rough proxy. Therefore, the more recent curvature of the graph is a reflection of the recent exponential growth in Social Media Activity.

Overall, we expect the Flow Index to grow at an ever-increasing pace in the coming years. With more people adopting new conventions and practices that take advantage of the advances in digital infrastructure, it is very likely that the growth rate of this index may eventually surpass that of the Foundation Index.

Exhibit 27: Virtual Flows (1993-2008)

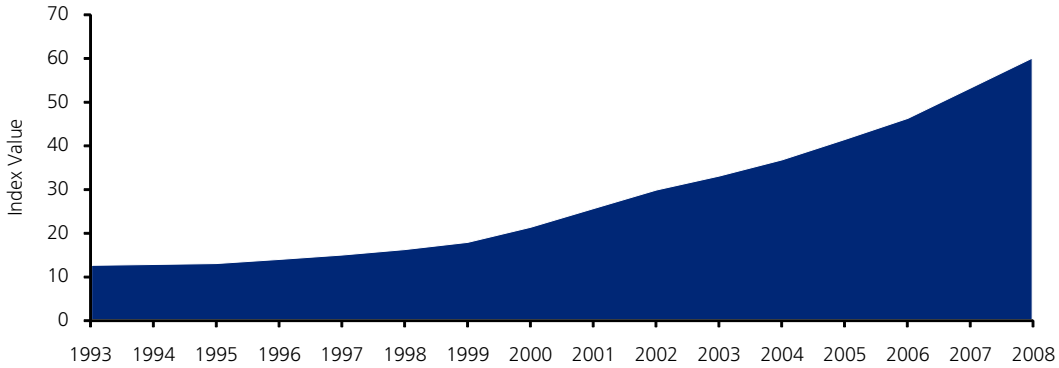


Exhibit 28: Physical Flows (1993-2008)

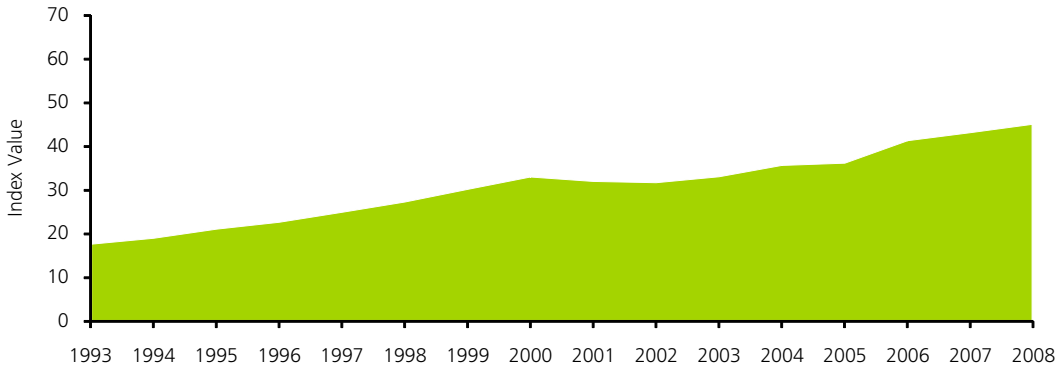
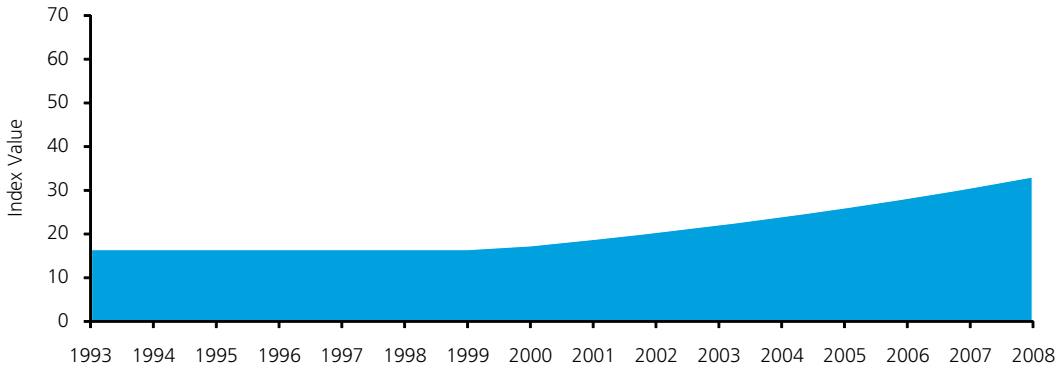


Exhibit 29: Flow Amplifiers (1993-2008)



Source: Deloitte analysis

The charts above represents the combined movements of the underlying metrics in the index, after data adjustments and indexing to a base year of 2003. Due to data availability, certain Flow Index metrics were indexed to 2008.For more information on the Index Creation process, see the Methodology section of the report.

Inter-Firm Knowledge Flows

Individuals are finding new ways to reach beyond the four walls of their organization to participate in diverse knowledge flows

Introduction

As the digital infrastructure and public policy shifts undermine stability and accelerate change, the primary sources of economic value are shifting. "Stocks" of knowledge—fixed and enduring know-how and experience—were once what companies accumulated and exploited to generate profits. Think of the proprietary formula for soft drinks or the patents protecting blockbuster drugs in the pharmaceuticals industry.

As the world becomes less predictable and faster changing, however, stocks of knowledge depreciate at a faster rate. The value of what we know at any one point in time diminishes. As one simple example, look at the rapid compression in product life cycles across many industries on a global scale. Even the most successful products fall by the wayside more quickly as new generations come through the pipeline faster and faster. In more stable periods, companies had plenty of time to exploit what they learned and discovered, knowing that they could generate value from that knowledge for an indefinite period. Not anymore.

To succeed now, companies (and individuals) have to continually refresh what they know by participating in relevant "flows" of new knowledge. Tapping into and harnessing the flows of knowledge, especially flows generated by the creation of new knowledge, increasingly defines one's competitive edge, personally and professionally. This capability is partly enabled by new technological advancements that allow people to connect virtually.

While research suggests that there is a high correlation between inter-firm knowledge flows and innovation,[30] an often-overlooked, but critical subtlety is the types of flows that result in these benefits. We believe the most valuable type of knowledge is tacit knowledge, which cannot easily be codified or abstractly aggregated. Tacit knowledge, which often embodies subtle but critical insights about processes or nuances of relationships, is best communicated through stories and personal connections—modalities that are typically discounted in most enterprises. While it would be impossible to quantify the core and richness of the types of flows that harness the greatest value, we have attempted to look at key drivers of these types of interactions in hopes that they would serve as a proxy for inter-firm knowledge flows.

Our exploration of inter-firm knowledge flows led us to design a survey-based study with more than 3,200 respondents [31]. Our conclusions were drawn from their responses to two questions that tested their participation and frequency of participation in eight categories ranging from using social media to connect with other professionals to conference attendance. Other questions in the survey measured aspects of the surveyed respondents' participation in these eight categories.

The expectation is that over time this trend will reveal the degree to which people are participating in inter-firm knowledge flows and the impact of that activity on organizations.

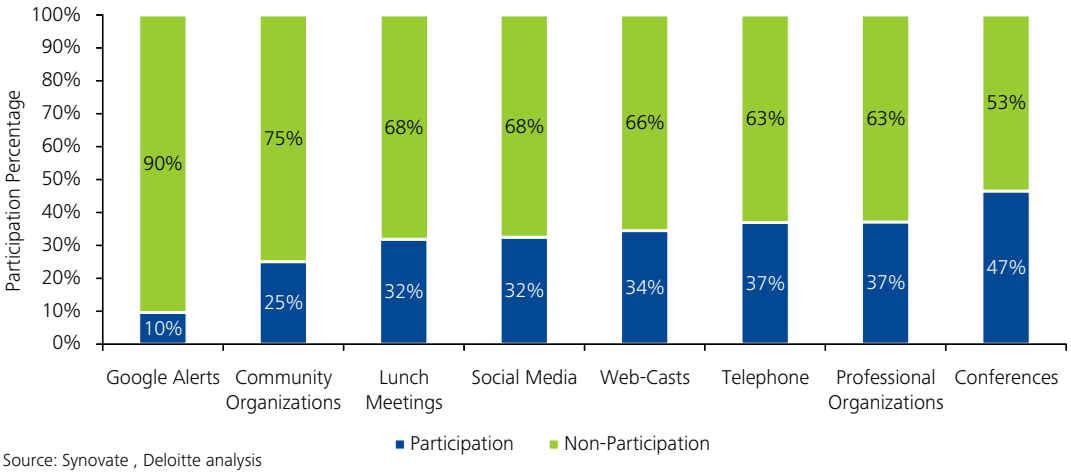
[30] See, for instance, Alessia Sammarra and Lucio Biggiero, "Heterogeneity and Specificity of Inter-Firm Knowledge Flows in Innovation Networks," Journal of Management Studies 45, no. 4 (2008): 800-29.

[31] For further information regarding survey scope and description, please refer to the Shift Index Methodology section.

Observations

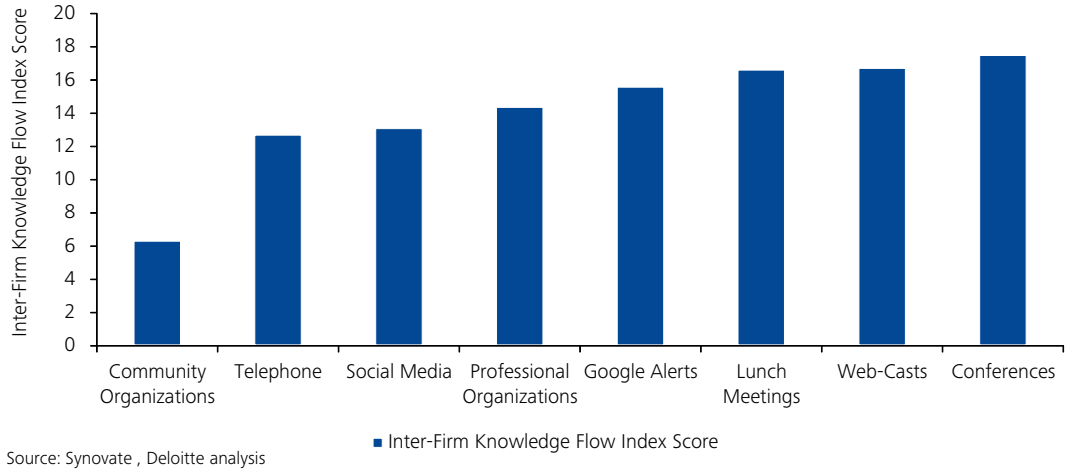
Exhibit 30 shows how much survey respondents participate in each type of inter-firm knowledge flow. Some of the categories represent professional activities in a more traditional sense, such as conference attendance, while others are still relatively new to the professional world, such as social media use. The survey found the highest level of participation via physical events, such as conferences—47 percent of those surveyed reported attending at least one conference per year. Interactions in face-to-face settings are where tacit knowledge creation and exchange is most rich, but 21 percent of respondents do not yet participate in any of these activities with professionals from other firms. In fact, many people are yet to participate in each type of knowledge flow, as shown by their non-participation in Exhibit 30. As these practices are more broadly adopted in the coming years, however, we expect this metric to move significantly.

Exhibit 30: Percentage participation in Inter-Firm knowledge flows (2008)



Source: Synovate , Deloitte analysis

Exhibit 31: Inter-firm knowledge flows score (2008)

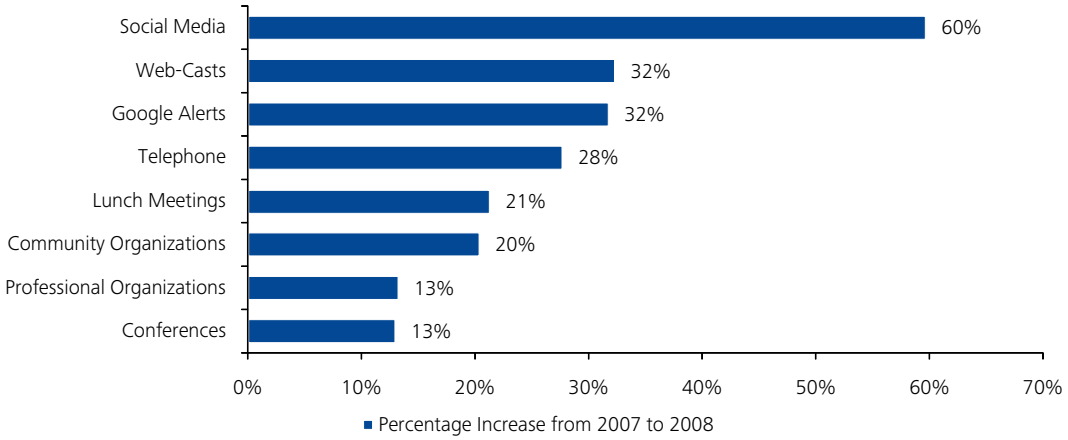


Source: Synovate , Deloitte analysis

The 2008 Inter-Firm Knowledge Flow Index value was 14 percent - the current volume of inter-firm knowledge flows as a percentage of the total possible. This score is based on the participation and frequency of participation in the activities tested (shown in Exhibit 31). Changes in this score over time will illustrate trends in how and how much people participate in knowledge flows in their professional lives.

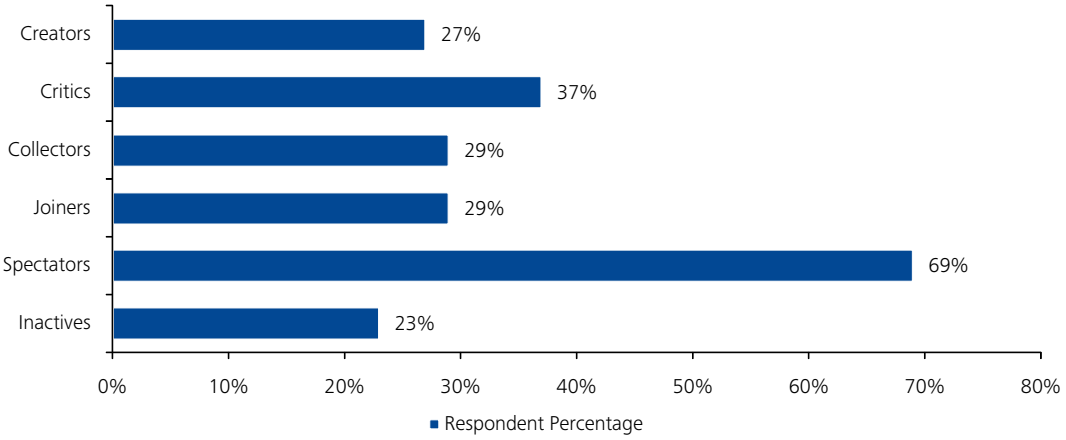
The survey also revealed newer ways of participating in knowledge flows. As shown in Exhibit 32, emerging activities are on the rise, such as using social media to connect with other professionals. While overall participation for this activity was at 33 percent, 60 percent of respondents participating in social media activities indicated they were spending more time on these activities, as compared to a year ago. Similarly, the results show that Google alert subscriptions and Web-cast attendance are also on the rise.

Exhibit 32: Increase in time spent on Inter-Firm knowledge flow activities in 2008 compared to 2007



Source: Synovate , Deloitte analysis

Exhibit 33: Social Profiles of technology decision-makers (2008)



Source: Forrester Research Inc.

Base: 1,217 North American and European technology decision-makers at firms with 100 or more employees

Forrester recently released research findings supporting the notion that business users are incorporating social media into their work lives. In this survey,[32] more than 1200 buyers in North America and Europe were asked the extent to which they use social technologies to make buying decisions as well as for personal reasons. While only representing the technology sector, the results (shown in Exhibit 33) are striking. The survey found that 69 percent of the decision makers were "spectators," meaning these buyers were reading blogs, watching user-generated video, and participating in other forms of social media. Some 29 percent of these decision makers are "joiners," meaning they belong to social networks. Another 27 percent are "creators," meaning they write blogs or upload articles, and 37 percent of these buyers are "critics," meaning they react to content displayed in social media space. These and similar findings from the survey indicate that professionals are relying on social media to make business decisions and are using this social media to form and join communities with peers of similar interests.[33]

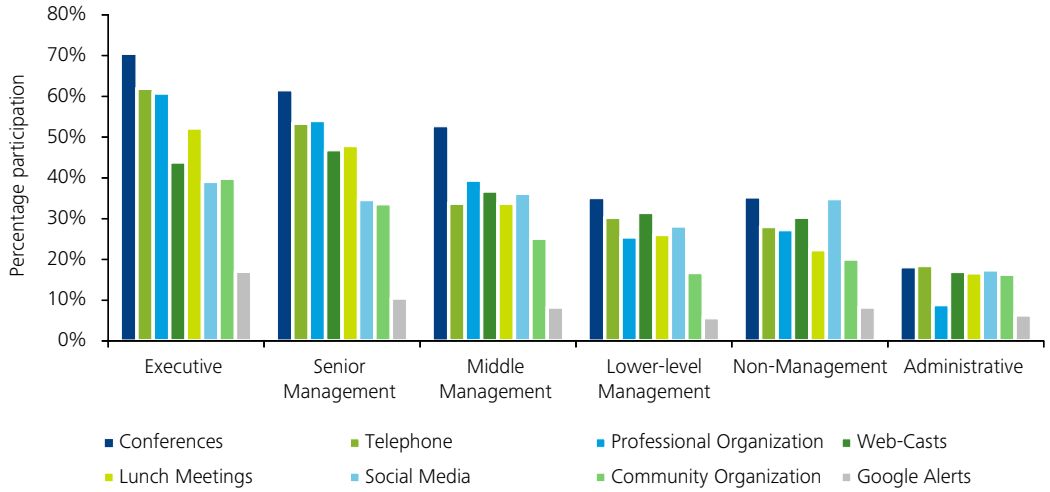
Our own survey also found a perhaps somewhat predictable correlation between the role of employees within a company[34] and their participation in different types of knowledge flows. As Exhibit 34 shows, the more senior role in the company the higher the participation in knowledge flows. Companies should look for ways to increase participation in knowledge flows at all levels of the organization, while looking to harness the knowledge of all their employees to fuel efficiency and innovation.

[32] For further information on this survey, please refer to the Social Media Activity metric.

[33] Bernoff, Josh. "New Research: B2B Buyers Have Very High Social Participation". Groundswell. February 23, 2009 <http://blogs.forrester.com/groundswell/data/index.html>.

[34] Our survey explicitly defined the administrative role as one with clerical or assistant duties and the executive role as a CEO, COO, president, senior VP, director, or VP.

Exhibit 34: Inter-Firm knowledge flow participation by level (2008)



Source: Synovate , Deloitte analysis

A key challenge for companies in the 21st century is to become more open to ideas from the outside and seek out and make use of resources wherever they may be located, internally or externally. Enabling and encouraging participation in inter-firm knowledge flows, while ensuring appropriate guidance and governance, will help generate a robust network of relationships across internal and external participants, creating opportunities for the "productive friction" that shapes learning as people with different backgrounds and skill sets engage with each other on real problems.[35] While many executives pursue the supposed nirvana of a frictionless economy, we believe that aggressive talent development inevitably and necessarily generates friction. It forces people out of their comfort zone and often involves confronting others with very different views as to what the right approach to a given situation, challenge, or opportunity might be.

[35] John Hagel III and John Seely Brown, "Productive Friction: How Difficult Business Partnerships Can Accelerate Innovation," Harvard Business Review, February 1, 2005.

Wireless Activity

More diverse communication options are increasing wireless usage and significantly increasing the scalability of connections

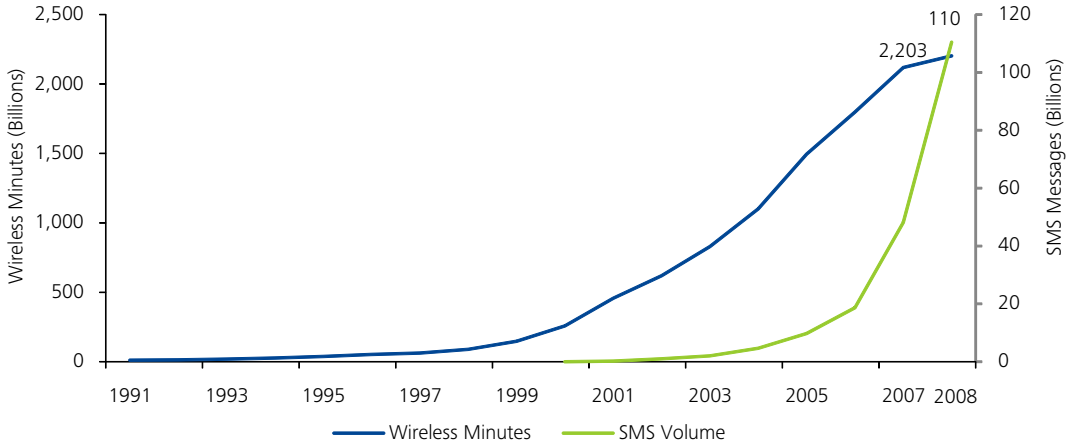
Introduction

This report stresses the importance of knowledge flows and tries to measure the degree to which they are increasing across inter-firm boundaries. We believe capturing the channels and vehicles through which knowledge moves is also important, as these play a crucial enabling function. In this regard, mobile telephony and the mobile Internet are playing increasingly vital roles. Directly measuring knowledge flows through mobile devices is difficult if not impossible. Yet wireless minutes and SMS volume (commonly referred to as text messaging) provide suggestive proxies. Together, they help represent the increasing degree to which connectivity and mobility are becoming essential in both social and business life.

Observations

As shown in Exhibit 35, Wireless Activity (wireless minutes and SMS volume) have increased sharply since 1991 despite competing connectivity applications, such as computer-based instant messaging.

Exhibit 35: Wireless Activities: Wireless minutes (1991-2008) vs. SMS volume (2000-2008)



Source: CTIA, Deloitte analysis

Over the past 18 years, total wireless minutes have shown a strong upward trend, growing from 11 billion in 1991 to 2.2 trillion in 2008.

Similar to wireless minutes, SMS volume has increased exponentially over the past nine years, growing from 14 million messages sent in 2000 (the earliest year for which data are available) to 110 billion in 2008.

Exhibit 36: Average number of phone calls and text messages by age group (2008)

Age Group	Average Number of Monthly Calls*	Average Number of Monthly Text Messages*
All Subscribers	204	357
Ages 12 & Under	137	428
Ages 13-17	231	1,742
Ages 18-24	265	790
Ages 25-34	239	331
Ages 35-44	223	236
Ages 45-54	193	128
Ages 55-64	145	38
Ages 65+	99	14

Source: Nielsen Telecom Practice Group
*Note: Data includes U.S. wireless subscribers only.

Exhibit 36 provides a snapshot of wireless minutes and SMS volume by age, suggesting that phone calls are losing ground to text messaging, which as a medium for communication and knowledge sharing is increasing in popularity. As of Q2 2008, a typical U.S. mobile subscriber sends or receives 357 text messages per month, as compared to placing or receiving 204 phone calls. Research shows that the typical U.S. teen mobile subscriber (ages 13–17) now sends or receives 1,742 text messages per month (as compared to making or receiving 231 mobile phone calls).[36]

Comparing growth rates of wireless activity highlights a shift in the way users are utilizing technology to connect and share information with one another. The exponential growth of wireless minutes over the past 18 years translates to a CAGR of 36 percent, as compared to SMS, which grew at a CAGR of 206 percent over the past nine years. Overall, in the first nine years since its introduction, SMS volume grew more than five times as fast as mobile minutes did in its first nine years, as shown in Exhibit 35.

This rapid growth of SMS volume could be attributed to the technological advancements that allowed inter-carrier texting as well as societal adoption patterns. Currently, this growth continues at a much faster pace than wireless minutes. For example, a snapshot of the most recent SMS activity shows a surge to 110 billion messages in 2008, up 129 percent from 48 billion messages in 2007. By comparison, the growth of wireless minutes during this same period was only four percent.

At the core, growth in Wireless Activity runs parallel with the technological advancements of the digital infrastructure, enabling users to leverage mobile phones in a multitude of ways. These technology performance metrics, such as Computing, Digital Storage, and Bandwidth continue to evolve at exponential rates, and our analysis shows that they are highly correlated to the growth of Wireless Activity, which serves as a catalyst for this platform for knowledge flows. The falling cost of mobile phones has made wireless connectivity an affordable prospect for many. In 1982, the first mobile

[36] "In U.S., SMS Text Messaging Tops Mobile Phone Calling". Nielsen News September 22, 2008.

[37] Liane Cassavoy, "In Pictures: A History of Cell Phones," PC World, May 7, 2007, http://www.pcworld.com/article/131450-15/in_pictures_a_history_of_cell_phones.html.

[38] Jason Chen, "iPhone 3G's True Price Compared," Gizmodo, http://gizmodo.com/5015540/iphone-3gs-true-price-compared (created June 11, 2008).

phones cost about $4,000, weighed almost two pounds, and were thrilling to users.[37] Compare that with the latest mobile devices, such as the iPhone, which cost about $200 and weighs just less than five ounces.[38] New-generation phones allow audio conferencing, call holding, call merging, caller ID, and integration with other cellular network features, which have fueled the growth of wireless minutes over the years. Additionally, these technologically advanced phones have keyboards (virtual in some cases), automatic spell checking and correction, predictive word capabilities, and a dynamic dictionary that learns new words, which have enhanced the SMS experience for people of all ages.[39]

Increased wireless activity has catalyzed the frequency and richness of virtual connections. Improvements to wireless technology and mobile Internet access have now empowered individuals to connect via such modes as email, social media, and blogging at all times and in all places. With more means of connecting with one another, people are now able to reach a broader base with higher frequency and more scalability.

Overall, while voice communication has increased over time, the visual SMS message as a means of communicating is increasing in popularity—perhaps because it supports frequent and concise communication with a broader range of participants. Technology advancements and societal trends are constantly changing the ways in which people share information, as evidenced by the historical growth of these types of wireless activity. The gap between personal and professional lives is slowly closing. While traditional mobile phone features, such as text and voice, will continue to be utilized, people are now more willing to experiment with new connection platforms, such as Twitter, where sharing 140 characters of information with others becomes a daily, if not hourly, practice. Additionally, with technological advancements, such as Google Latitude, people are redefining the boundaries between the virtual and physical world, now able to locate friends and colleagues on digital maps and then connect with them in person.

Traditional means of communication are changing. Thus, finding innovative and effective ways to harness the potential of these communications and mobilize resources will be essential.

[39] "iPhone," Wikipedia, http://en.wikipedia.org/wiki/IPhone (last modified June 9, 2009).

Internet Activity

The rapid growth of Internet activity reflects both broader availability and richer opportunities for connection with a growing range of people and resources

Introduction

Wikipedia defines the Internet as "a global network of interconnected computers, enabling users to share information along multiple channels."[40] Over the past decade, bolstered by technological breakthroughs, the channels that support the Internet have continued to grow. From email to instant messaging to streaming video to social media—there are endless ways for people to share information, communicate, and view content. The richness and magnitude of the data transmitted across these channels is constantly expanding as a result of societal and technological changes that are foundational to this activity.

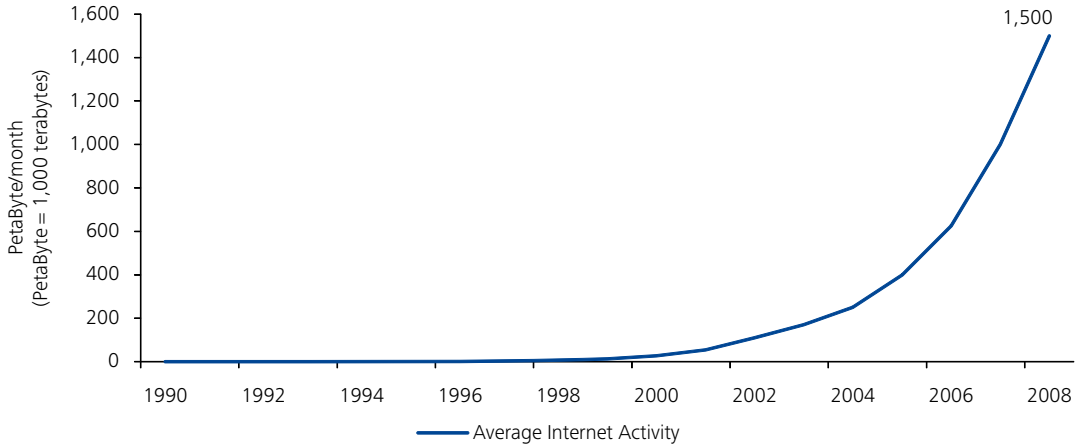
While nearly impossible to quantify how much volume travels across the Internet as a whole, TeleGeography's Global Internet Geography Report provides data for Internet volume on the top 20 highest-capacity U.S. domestic routes. Examining the rate of traffic growth on the top 20 major inter-city routes is a reasonable proxy for the country's overall Internet traffic patterns.

By studying this trend over time, we can see how much information is being transmitted via the Internet and attempt to interpret the effects on knowledge flows.

Observations

As shown in Exhibit 37, Internet Activity has grown exponentially in the last 19 years.[41] For the top 20 U.S. routes (in terms of capacity), average Internet volume increased 47 percent between 2007 and 2008. Some of the most rapid growth was found along the following routes: Chicago-Denver, New York-San Francisco, and Chicago-San Francisco.

Exhibit 37: Internet Activity (1990-2008)



Source: Minnesota Internet Traffic Studies (MINTS), Deloitte analysis

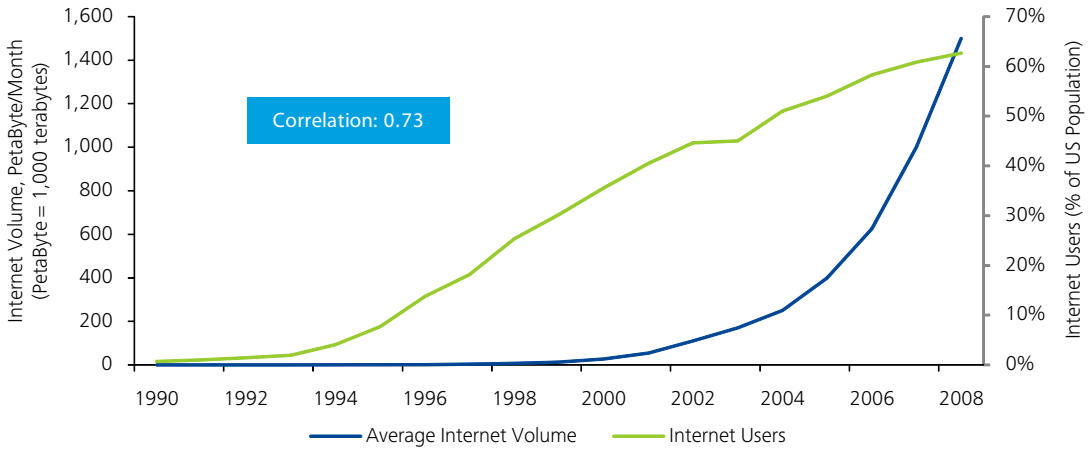
[40] "Internet," Wikipedia, http://en.wikipedia.org/wiki/Internet (last modified June 8, 2009).

[41] Minnesota Internet Traffic Study (MINTS), Deloitte analysis.

This steady growth over the 19 year period translates to a CAGR of 120 percent. Underlying this growth are the rapid improvements in computational power, storage, and bandwidth that enabled Web content to become richer and more robust.

While exploring basic quantitative relationships between the metrics comprising the Big Shift, we found an unsurprisingly high correlation between the growth of Internet volume and the growth of the usage of connectivity platforms, such as the Internet and wireless devices. The penetration of these technological advancements is evident, with the rise of Internet users and wireless subscriptions nearing penetration levels of 63 percent (as shown in Exhibit 38) and 83 percent respectively, as of 2008. We have already seen the mobile Internet user base increase 49 percent from a year ago.[42] The installed base of users armed with cell phones and wireless access will spur even more Internet volume and continue to support this growth. This is because users are now able to remotely access video, Web content, images, and other means of information sharing in virtually any location, whereas before they were constrained to their desk or home.

Exhibit 38: Correlation between Internet Activity and Internet Users (1990-2008)



Source: comScore, Minnesota Internet Traffic Studies (MINTS), Deloitte analysis

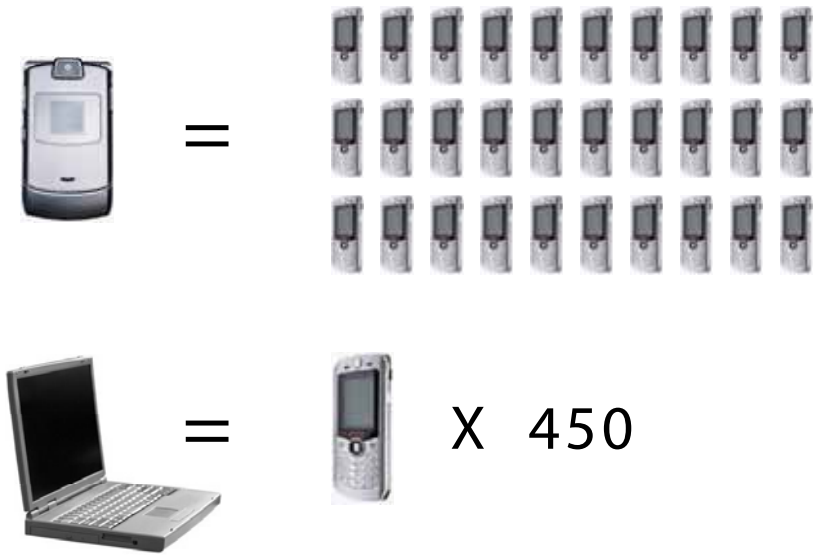
Exhibit 39 takes mobile data traffic and shows how profound the impact of technologically advanced mobile devices and laptops is on Internet volume.[43] A single laptop can generate as much traffic as 450 basic-feature phones, and a high-end handset, such as an iPhone or Blackberry device, creates as much traffic as 30 basic-feature phones. These new devices offer content and applications not supported by the previous generation of phones, such as video and music, which account for a large amount of the richness and volume of mobile Internet traffic.[44]

[42] For further information, please refer to the Internet Users and Wireless Subscriptions metrics.

[43] *Cisco® Visual Networking Index Forecast: Global Mobile Data Traffic Forecast Update*, Cisco, http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html (created on January 29, 2009).

[44] Ibid.

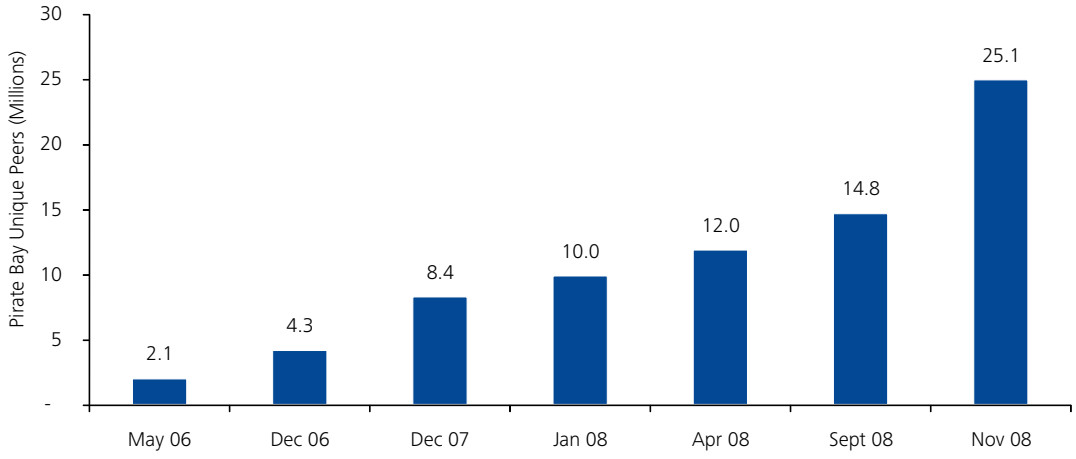
Exhibit 39: High-end handsets and laptops can multiply traffic



Source: Cisco® Visual Networking Index Forecast

As shown in Exhibit 40, we also see strong growth in peer–to-peer exchanges of music, video, and files. In a two-month span (from September 2008 to November 2008), there was a 70 percent increase in users, who are all sharing and downloading rich content.[45]

Exhibit 40: Illicit P2P usage – number of users on Pirate Bay network (2006-2008)



Source: The Pirate Bay

[45] http://thepiratebay.org/

As noted, the amount of video content being transmitted over the Internet continues to grow. The recent Olympics in Beijing are a testament to the globally connected rich content experience shared by online users. The number of professional content providers continues to grow, opting to push content nearer to end users in an effort gain viewership. These Web sites offer original content to subscribers through news, product information, blogs, reviews, games, and entertainment. New players are popping up every day in the content delivery space, spurring greater Internet Activity.

Electronic networks and geographic spikes reinforce each other, helping to integrate physical and virtual connections. Our analysis of Migration of People to Creative Cities has shown large disparities between population growth in the 10 most and least creative cities in the United States. Striking, but perhaps not so surprising, is the high correlation between cities with the highest Internet volume and top creative cities, as identified by Dr. Richard Florida. Some 90 percent of the cities having highest the Internet volume were also creative cities, indicating their remarkable role in the growth of information sharing and Internet volume.

Online communities, which emphasize communication and information sharing among participants, are also flourishing. Social media dominates this category; social networking leaders, like Facebook, MySpace, Twitter, and LinkedIn, continue to grow their membership bases.

The growth in Internet Activity indicates new ways for businesses to participate in and create communities on the Internet. Emerging practices, such as open source software, that leverage these virtual communities hold great promise for companies.[46] Organizations will have plenty of opportunities to leverage the Internet through networks, communities, and other connectivity platforms, but will have to approach this process in a strategic manner to attain the most value.

The massive amount of information exchanged virtually, however, will make filtering the signal from the noise even more difficult. Society's case of information overload will only increase, for better and for worse. The capability to filter and amass the right information at the right time for the right purposes will be one of the great challenges in the Big Shift era—both for individuals and institutions.

[46] John Hagel III and John Seely Brown, "Creation Nets: Harnessing the Potential of Open Innovation," Journal of Service Science 1, no. 2 (2008): 27-40.

Migration of People to Creative Cities

Increasing migration suggests virtual connection is not enough—people increasingly seek rich and serendipitous face-to-face encounters as well

Introduction

When it comes to creating flows of new, tacit knowledge, face-to-face interactions are by far the most valuable. Yet these interactions and the knowledge flows they can generate are difficult to measure directly, and we must turn instead to proxies.

One of these is the growth in population, as provided by the U.S. Census Bureau, within the creative cities defined by Dr. Richard Florida.[47] This matters because the more creative talent that gathers in one place, one can reasonably assume, the more face-to-face interactions will occur between them—and the more new knowledge will be created. As creative talent congregates, innovation and economic growth ensue.

Richard Florida ranks each U.S. region[48] by its creative index score, which is calculated as three equally weighted parts: technology, talent, and tolerance. This same index score can also reveal a region's underlying creative capabilities by unveiling the sub-components of each weighted part. Cities with high creative index scores have high concentrations of creative class workers (talent), have high concentrations of high-tech companies and innovative activity (technology), and are demographically diverse (tolerance). We have extended Florida's work by tracking migration patterns across creative cities and tallying the rate at which the population gap between the top and bottom 10 creative cities (identified in Exhibit 41) widens.[49]

[47] Richard Florida, The Rise of the Creative Class (New York: Basic Books, 2004).

[48] Metropolitan Statistical Areas (MSA) and Consolidated Metropolitan Statistical Areas (CMSA) as defined by the U.S. Census: Robert Bernstein, "Statistical Brief," Bureau of the Census, http://www.census.gov/apsd/www/statbrief/sb94_9.pdf (created May 1, 2009).

[49] The list of creative cities was pulled from Florida's The Rise of the Creative Class.

Exhibit 41: Top 10 Creative Cities and Bottom 10 Creative Cities

Rank	Creative Cities / Regions	Creativity Index	Overall (all regions rank)	Technology Rank	Talent Rank	Tolerance Rank
1	Austin	0.963	1	2	9	22
2	San Francisco	0.958	2	6	12	20
3	Seattle	0.955	3	21	15	3
4	Boston	0.934	5	35	11	12
5	Raleigh-Durham	0.932	6	5	2	52
6	Portland	0.926	7	12	45	7
7	Minneapolis	0.900	10	47	22	17
8	Washington -Baltimore	0.897	11	41	1	45
9	Sacramento	0.895	13	15	27	47
10	Denver	0.876	14	61	18	25
40	Norfolk	0.557	113	130	90	149
41	Cleveland	0.550	118	139	95	139
42	Milwaukee	0.539	124	155	108	120
43	Grand Rapids	0.525	131	102	206	86
44	Memphis	0.524	132	78	135	183
45	Jacksonville	0.498	143	224	107	88
46	Greensboro	0.492	145	148	159	113
47	New Orleans	0.490	147	211	99	113
48	Buffalo	0.483	150	148	104	175
49	Louisville	0.409	171	189	160	143

Source: Richard Florida, "The Rise of the Creative Class"

This metric thus becomes a proxy for the level of tacit knowledge, geographic spikiness, and mobility to areas most likely to have rich knowledge flows. As the migration of people to creative cities maintains an upward trend, society can be perceived to be more "spiky" and more likely to engage in tacit knowledge creation and exchange—at least in creative areas of the country.

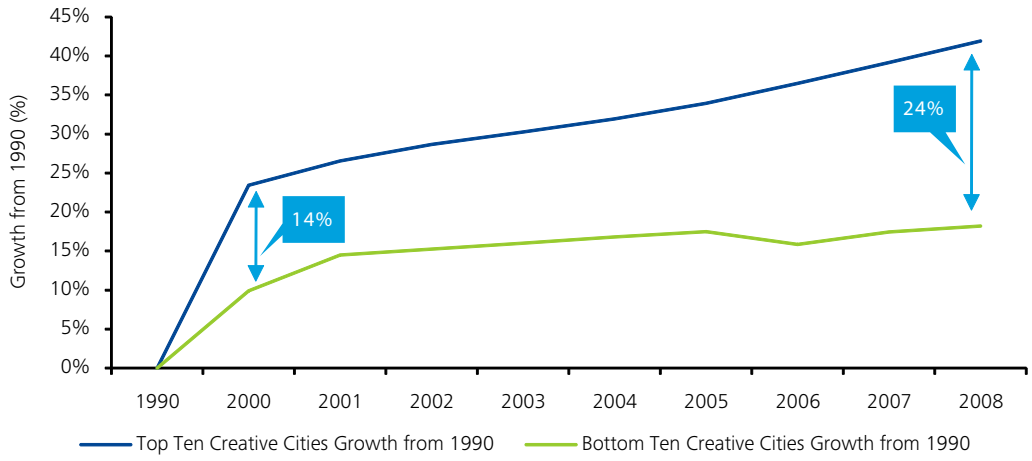
Observations

Cities that attract creative talent (defined by Richard Florida to include professions such as computer engineers, healthcare professionals, and architects) are rich spawning grounds for knowledge flows, especially across firms. As people congregate in these creative epicenters, they are much more likely to make serendipitous connections with people from outside their own firm. Increasing returns appear to be at work here—cities that have larger concentrations of creative talent are growing faster than those with lower concentrations.

Consider the population growth of the top 10 creative cities (with population greater than one million) against the bottom 10. As shown in Exhibit 42, the top 10 cities show a significant upward trend in population growth and an increasing gap relative to the bottom 10.[50]

[50] Deloitte analysis based on "Creative Cities" from Richard Florida's *The Rise of the Creative Class* and population data from the U.S. Census Bureau.

Exhibit 42: Migration to Creative Cities growth and gap (1990-2008)



Source: US Census Bureau, Richard Florida's "The Rise of the Creative Class", Deloitte analysis

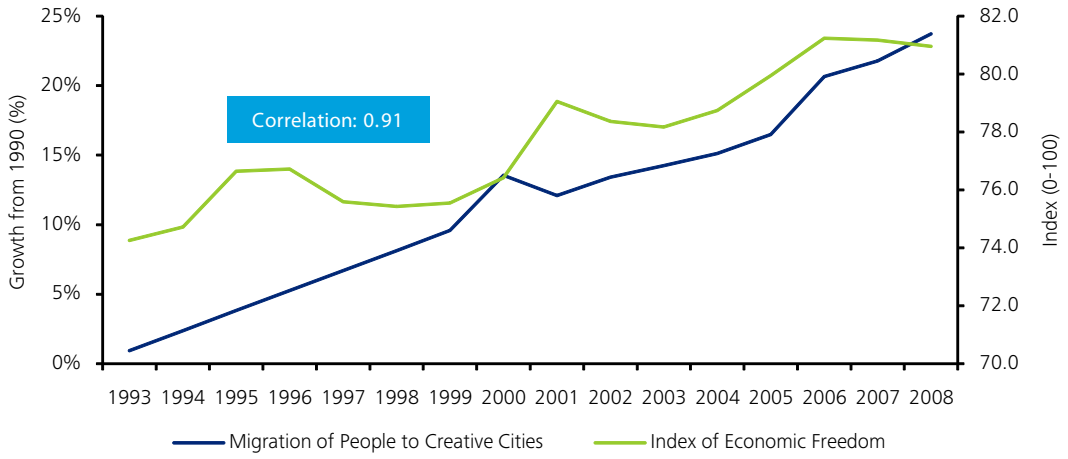
On average, the top 10 creative cities have outpaced the bottom 10 in terms of population growth since 1990, and by 2008, the growth gap between the two comparative sets had reached an absolute 24 percent. In other words, the growth of the top 10 creative cities has been more sustained than that of the bottom 10. Between 1990 and 2008, the top 10 cities grew by 42 percent, whereas the bottom 10 grew by only 18 percent. The actual number of people also swelled, with 22 million more people in aggregate living in top creative cities, which equates to approximately 12 percent of the U.S. population, as compared with just 5 percent of the U.S. population living in the bottom creative cities.

As noted earlier in our report, although Big Shift forces are significantly driven by technological advances, we should re-emphasize that not all of the connections are virtual. At the same time that the Internet helps to connect people in virtual groups, increases in the Economic Freedom metric make it easier for people from around the world to travel and gather in geographic spikes (see Exhibit 43). These spikes represent concentrations of talent in dense geographic settlements, like Silicon Valley and Boston. At a time when the world is increasingly flat, the world is also paradoxically becoming increasingly spiky.[51] The share of the world's population living in urban areas has grown from 30 percent in 1950 to about 50 percent today. As we have seen, much of this growth is into the cities and regions that drive the world's economy, which are growing at a much more rapid rate than less creative cities.

The reason these spikes are becoming more and more important is because we are facing more and more pressure as individuals and companies as we struggle to develop talent. These spikes become important as areas for talent development because people feel not only opportunity but also pressure to grow. They are driven to congregate or risk being marginalized.

[51] Richard Florida, "The World is Spiky," *The Atlantic Monthly*, October 2005: 48-51.

Exhibit 43: Correlation between Migration of People to Creative Cities and Economic Freedom (1993-2008)

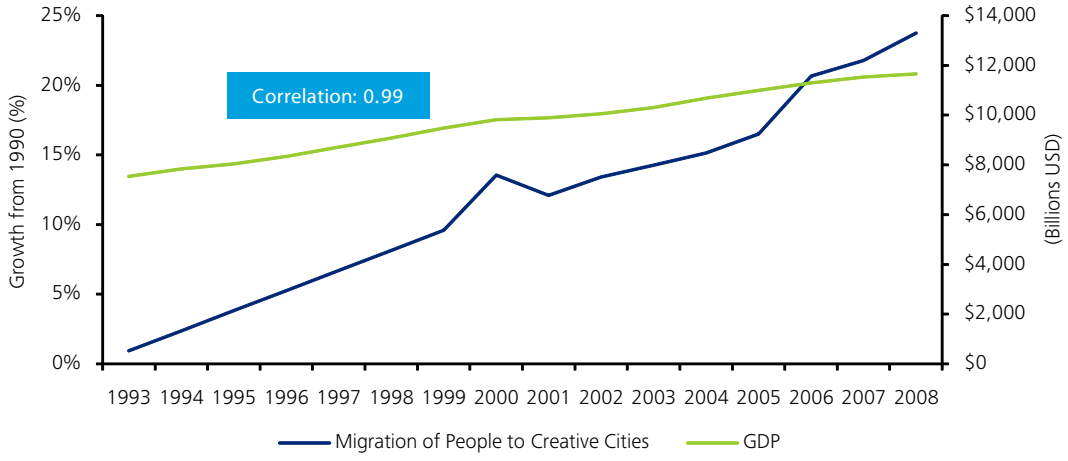


Source: US Census Bureau, Heritage Foundation, Richard Florida's "The Rise of the Creative Class", Deloitte analysis

Spikes will become more viable as more connectivity is facilitated. This connectivity enables people to specialize more easily in a given spike and coordinate activities across spikes. For example, Silicon Valley was able to specialize more deeply in technology innovation and commercialization, as it was able to move manufacturing activities to other spikes. At the same time, China has developed a series of spikes specializing in manufacturing for technology companies. Serendipity within spikes is further enhanced by wireless technology that more effectively integrates physical and virtual presence.

Our analysis illustrates a high correlation between the growth of creative cities and that of GDP, suggesting that the movement of people to creative cities drives significant economic value creation (see Exhibit 44).

Exhibit 44: Correlation between Migration of People to Creative Cities and GDP (1993-2008)



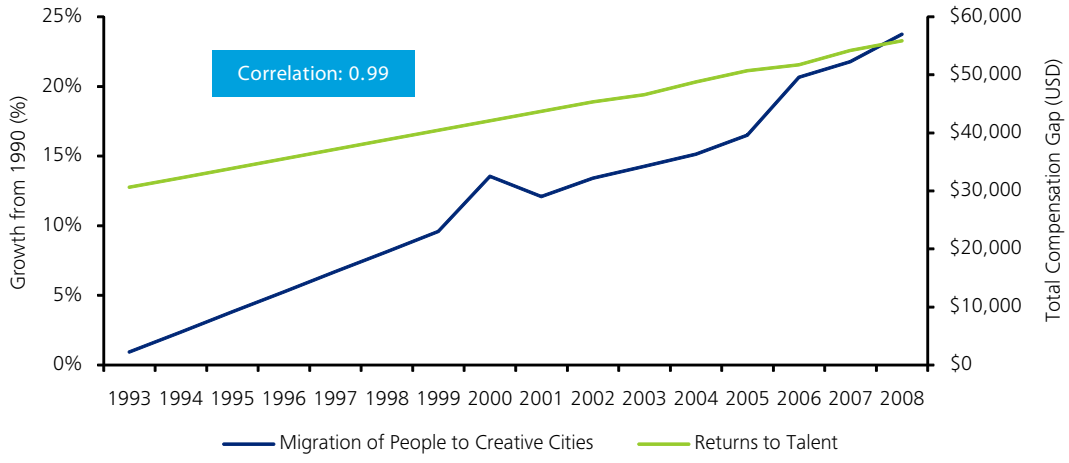
Source: US Census Bureau, Bureau of Economic Analysis, Deloitte analysis

The Returns to Talent metric in the Impact Index also correlates strongly with Migration of People to Creative Cities, suggesting that the types of talent that make up the workforce in creative cities are valued increasingly highly as they become more concentrated in these creative epicenters (see Exhibit 45) and interact more and more. As labor freedom and economic freedom increase, people appear to have a propensity to migrate to creative cities, leading to higher concentrations of talent. These epicenters of creative talent likely contributed to the recent growth in GDP and played a role in productivity increases.

There is a simple but powerful reason that, in the past two decades, talented people have moved to creative cities at an increasingly higher rate, relative to less creative cities. They are migrating because they believe they can learn faster and better there.[52] And with inter-firm knowledge flows[53] becoming increasingly vital to economic value creation, talented workers are going where these flows are most likely to occur.

The same self-reinforcing dynamic may hold true for talented workers, who "migrate" to companies that have high concentrations of creative talent. Like cities, companies that do not attract top talent now will find it ever harder to do so in the future. By better understanding the drivers of the disproportionate growth in creative cities, business leaders can create organizations that mimic the environment that makes those cities so creative. Best practices, such as recognizing and tapping into creative talent, making the best use of technology, and striving for innovation and diversity are all significant components of cities' creative index. Firms will find it helpful to deploy similar approaches—such as pull platforms and mass career customization practices[54]—as they adapt to the exigencies of the Big Shift.[55]

Exhibit 45: Correlation between Migration of People to Creative Cities and Returns to Talent (1993-2008)



Source: US Census Bureau, Bureau of Labor Statistics, Richard Florida's "The Rise of the Creative Class", Deloitte analysis

[52] We acknowledge that this is not the only factor to creative city growth—creative cities also tend to be pleasant places, and creative people may just like hanging out with other "creative people" or may be seeking a different way of life.

[53] For further information, please refer to the Inter-Firm Knowledge Flows metric.

[54] Cathy Benko and Anne Weisberg, Mass Career Customization (Boston: Harvard Business School Publishing, 2007).

[55] For more information about the strategic, organizational, and operational changes needed to attract and develop talented workers, see John Hagel III, John Seely Brown, and Lang Davison, "Talent is Everything," The Conference Board Review, May-June 2009, http://www.tcbreview.com/talent-is-everything.php.

Travel Volume

Travel volume continues to grow as virtual connectivity expands, indicating that these may not be substitutes but complements

Introduction

Steady advances in technology and physical infrastructure during the last 20 years have created travel options that are more universally accessible, yet still affordable.[56] U.S. residents travel more and more each year. As the movement of people increases, so, too, do the opportunities for rich and serendipitous connections between them, connections that are vital for knowledge flows to take place. Thus, the flow of travelers captured in this metric becomes an important part of how we measure long-term change as a whole.

To measure the volume of people travelling, the Shift Index uses the Transportation Services Index (TSI) for Passengers, published by the Bureau of Transportation Statistics (BTS) , the statistical agency of the U.S. Department of Transportation (DOT). The passenger TSI measures the movement and month-to-month changes in the output of services provided by the for-hire passenger transportation industries. [57] The passenger TSI measures the movement and month-to-month changes in the output of services provided by the for-hire passenger transportation industries.[58]

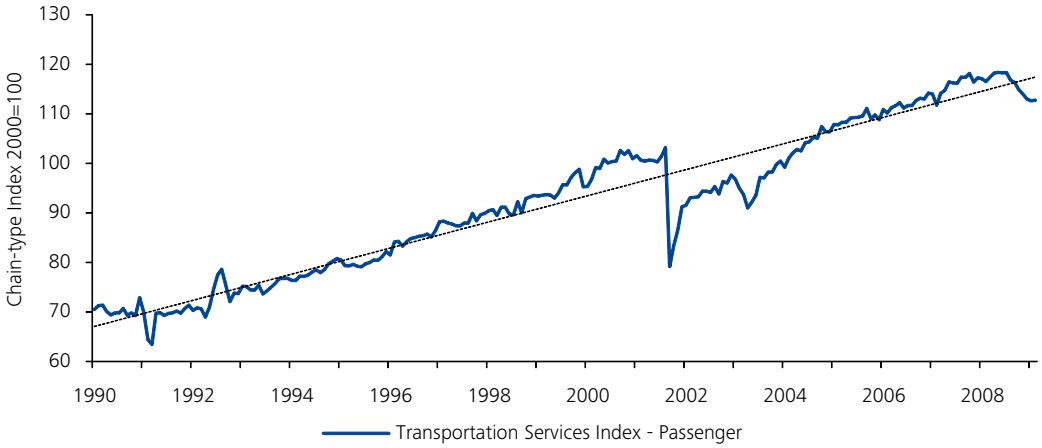
The seasonally adjusted index consists of data from passenger air transportation (the largest component of the passenger TSI[59]), intercity passenger rail, and mass transit[60] (the smallest component of the passenger TSI).

As with the Migration of People to Creative Cities[61] metric, certain kinds of interactions are more likely to drive the most valuable knowledge flows—those that result in new knowledge creation rather than simple knowledge transfer. These are primarily face-to-face interactions. While we cannot measure these knowledge flows directly, we can look to proxies, such as the TSI.

Observations

Since 1990, the passenger TSI has shown a strong upward secular trend, as shown in Exhibit 46. Using 2000 as a base year with an index value of 100, the passenger TSI has ranged from a value of 71 at the beginning of 1990 to 117 at the end of 2008, reflecting an increase of 65 percent over 18 years.

Exhibit 46: Transportation Services Index - Passenger (1990-2009)



Source: Bureau of Transportation Statistics (BTS), the statistical agency of the U.S. Department of Transportation (DOT), Deloitte analysis

[56] Domestic Research: Travel Volume and Trends," U.S. Travel Association, http://www.tia.org/Travel/tvt.asp (created May 8, 2009).

[57] Kajal Lahiri et al., "Monthly Output Index for the US Transportation Sector," Journal of Transportation and Statistics 2002: 1-23.

[58] "Transportation Services Index FAQ," Bureau of Transportation Statistics, http://www.bts.gov/help/transportation_services_index.html (created May 15, 2009).

[59] Peg Young et al., "Transportation Services Index and the Economy," Bureau of Transportation Statistics Technical Report, December 2007: 1-12.

[60] The index does not include intercity buses, sightseeing services, taxis, private automobiles, bicycles, and other non-motorized vehicles due to limited data availability or because they did not reflect service for hire.

[61] For further information, please refer to the Migration of People to Creative Cities metric.

The movement of the index over time can be compared with other economic measures to understand the relationship of transportation to long-term changes in the economy. In fact, in 2004, then U.S. Transportation Secretary Norman Mineta announced the TSI as a new economic indicator, intended to use changes in passenger activity as a measure of macroeconomic performance.[62]

Although TSI growth has been strong, it has not always held a positive slope. Exhibit 46 also shows troughs in 2001 and 2003[63]:

- In 2001, the dip in the Passenger TSI was driven principally by 9/11 and reverberations of the dot-com crash. The passenger TSI dropped over 23 percent in one month and did not rebound to its pre-9/11 level until June 2004, nearly three years later; otherwise, the TSI has shown strong upward trends from 1990.
- In 2003, the dip in passenger TSI could be attributed to a decrease in revenue passenger miles; overproduction, spending of billions of dollars to expand, and too much debt contributed to lagging financial health and a reduced number of flights.

The TSI will undoubtedly show another trough corresponding to today's Great Recession. Clearly, the passenger TSI reflects economic and political pressures and can be expected to continue to do so in the future. What we are interested in here, however, is the longer-term trends in travel volume.

As confirmed in other prominent research,[64] increases in travel are strongly correlated with growth in GDP.[65] After evaluating the relationship, one can easily see that the TSI is a coincident indicator of GDP. While not purporting causality, people's movement on land and in air is interrelated with economic expansions and contractions. Secretary Norman Mineta noted, "A transportation system that keeps the business of America moving is vital to the strength of our Nation's economy" and, we argue, equally fundamental to Big Shift forces.

There appears to be a statistically strong correlation between travel activity and broader labor productivity—as travel activity increases, so does our measure of labor productivity. One plausible explanation for this correlation is that people benefit from face-to-face physical interactions facilitated by travel and as a result are able to be more productive in their jobs.

One of the counterintuitive findings yielded by our basic correlation analysis (detailed in the Shift Index Methodology section) is that growth in digital technology infrastructure correlates with growth in travel rather than being inversely related. Many people had predicted an inverse relationship between them, maintaining that travel would decrease as the option to connect virtually became richer and more robust. In all cases, Travel Volume correlated, at the level of statistical significance, with Internet Users, Wireless Subscriptions, Wireless Activity, and Internet Activity. One plausible explanation for this is that the digital world actually scales the ability to have more and more physical interactions. The frequency and ubiquitous nature of virtual communication increases the propensity to travel by creating more reasons to connect with people physically. Until we reach the age of the holograph deck, it seems humans are resistant to the notion that technological advancements may replace the need for face-to-face interaction. Instead, in a society where people are free to travel and migrate as they desire, people are taking advantage of technology innovations to meet in new and creative ways for tacit knowledge exchange.

Travel will likely always remain a critical mode for increased physical face-to-face interactions. Business leaders should consider the trade-offs when cutting back on travel during economic downturns or thinking of technology as a pure play substitute for travel rather than as a complement. Travel is not only interrelated with macro-economic activity, such as economic value growth and labor productivity, but also with Shift Index metrics, such as Wireless Activity and Internet Activity. The physical and virtual worlds remain intertwined.

[62] "Remarks for the Honorable Norman Mineta Secretary of Transportation," U.S. Department of Transportation Office of Public Affairs, http://www.dot.gov/affairs/minetasp012904.htm (created May 15, 2009).

[63] Peg Young et al., "The Transportation Services Index Shows Monthly Change in Freight and Passenger Transportation Services," Bureau of Transportation Statistics Technical Report, September 2007: 1-4.

[64] Ibid.

[65] For further information, please refer to the Shift Index Methodology section.

Movement of Capital

Capital flows are an important means not just to improve efficiency but also to access pockets of innovation globally

Introduction

The flow of capital across geographic and institutional boundaries is an important, albeit indirect, indicator of the forces of long-term change. These capital flows can be understood as a form of arbitrage in which knowledge moves, via conduits created by investment, from one country—and company—to another.

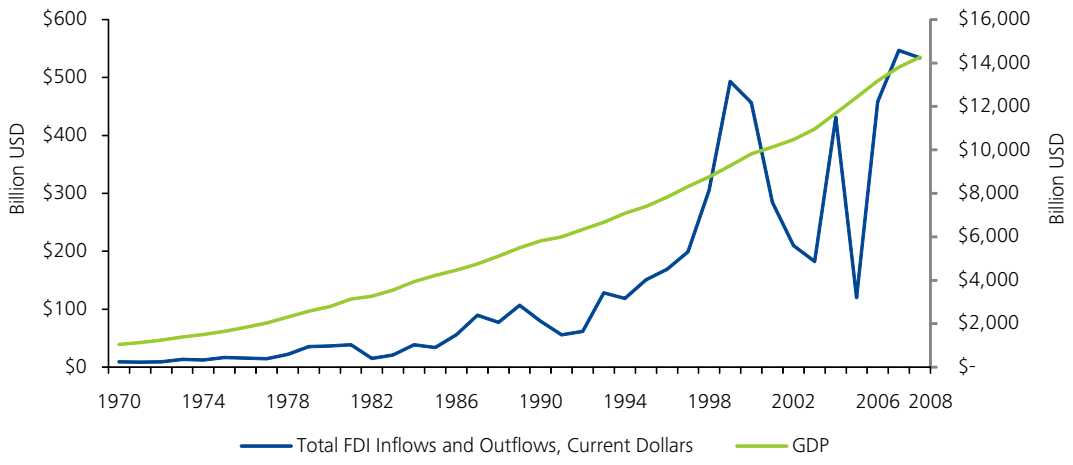
Companies in emerging economies, for example, take stakes in or buy outright companies in developed countries for, among other reasons (such as brand equity), access to knowledge and expertise. Developed country companies, on the other hand, have traditionally invested in emerging-market companies to acquire local knowledge, for instance, regarding the most efficient means of distribution in those markets. Thus, capital flows become a means for the knowledge flows that drive economic value creation.

The Shift Index uses Foreign Direct Investments (FDI) inflows and outflows as a proxy for capital flows between countries.[66] FDI measures both flows of capital (e.g., equity investments and intra-company loans) and stocks of capital (e.g., reinvested capital and retained earnings). For the purpose of the Shift Index, we review FDI flows only and exclude FDI stocks. Moreover, we evaluate the total amount of capital movement as captured by both inflows and outflows together without netting the two. This approach allows us to focus directly on the flow of funds between countries triggered by both public policy liberalization trends and competitive pressures that force companies to seek business optimization by searching for both efficiency and innovation outside of their home country.

Observations

As Exhibit 47 demonstrates, U.S. FDI flows have steadily increased tracking GDP since 1970 and peaked in 1999. From 2001 to 2003, total FDI flows decreased as a result of the economic downturn and the aftermath of the September 11th terrorist attack. Investors faced uncertainties, and U.S. policymakers began viewing foreign investments as a risk to national security.[67]

Exhibit 47: Foreign direct investment flows (1970-2008E)



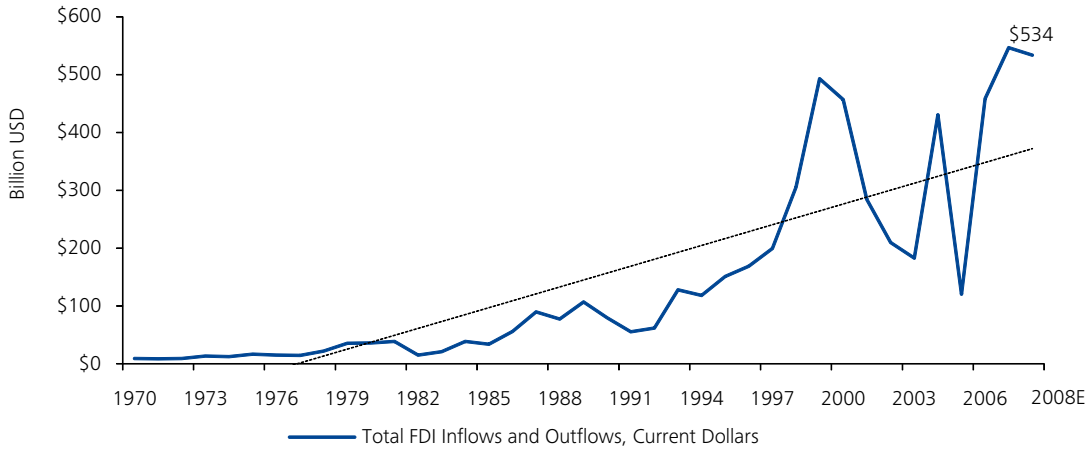
Source: UNCTAD, Deloitte analysis

[66] FDI, which includes equity capital, reinvested earnings, and intra-company loans, is defined by OECD as "investment by a resident entity in one economy with the objective of obtaining a lasting interest in an enterprise resident in another economy. The lasting interest means the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the direct investor on the management of the direct investment enterprise. The ownership of at least 10 percent of the voting power, representing the influence by the investor, is the basic criterion used. Hence, control by the foreign investor is not required." OECD Factbook 2009 (Paris: OECD, 2009).

[67] James J. Jackson, "Foreign Direct Investment: Current Issues" (report to Congress, Congressional Record Services, Washington, DC, April 27, 2007).

2004 brought a "return to normal" in terms of the leadership position of the United States as a world's principal destination for direct investments, which it maintained for most of the last two decades, as shown in Exhibit 48. Moreover, this position as a provider of FDI became even stronger, demonstrating a sharp increase. (Note: the drop in U.S. direct investments in 2005 reflects actions by U.S. parent companies to take advantage of a one-time tax provision).[68]

Exhibit 48: Movement of Capital (1970-2008E)



Source: UNCTAD, Deloitte analysis

In 2004, U.S. FDI began an upward trend, reaching its historical peak in 2007. The financial crisis of 2008 is expected to negatively impact FDI, ending the growth cycle that started in 2004. Two factors are expected to drive this decrease. First, the capability of companies to invest has been reduced due to reduced access to capital both internally (due to a decline in corporate profits) and externally (due to lower availability and the higher cost of financing). Second, firms' propensity to invest has been adversely impacted, as they are uncertain about the future and are in the process of battling a recession.[69]

Economists argue that relative rates of growth between economies are indicative of relative rates of return and corporate profitability and thus are a key factor in determining the direction and magnitude of capital flows. Public policy, including relative tax rates, interest rates, inflation, and any protectionist policies (e.g., business visas), has a direct impact on FDI levels.[70] Investors' expectations about the performance of national economies also drive investment trends. All these factors are quite volatile at times and thus result in the volatility of investment trends.[71] This volatility is easily observed when looking at Exhibit 49. Since cyclical events drive the volatility of FDI levels, we look instead at its long-term trajectory to gauge trends. Over time, we see that FDI flows demonstrate upward movement, as shown in Exhibit 49.

[67] James J. Jackson, "Foreign Direct Investment: Current Issues" (report to Congress, Congressional Record Services, Washington, DC, April 27, 2007).

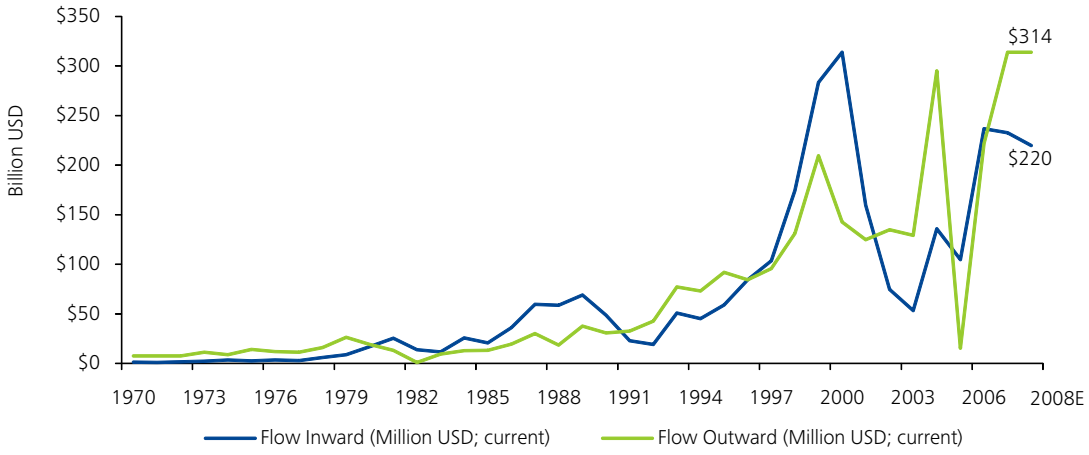
[68] Ibid.

[69] UNCTAD, Assessing the Impact of the Current Financial and Economic Crisis in Global FDI Flows, http://www.unctad.org/en/docs/webdiaeia20091_en.pdf (created January 2009).

[70] "Foreign investors view the ease with which they can travel to the United States as a key indicator of how easy it will be to make or administrate investment." Visas and Foreign Direct Investment: Supporting US Competitiveness by Facilitating International Travel, US Department of Commerce, http://www.commerce.gov/s/groups/public/@doc/@os/@opa/documents/content/prod01_004714.pdf (created November 2007).

[71] James K. Jackson, "Foreign Direct Investment: Effect of a 'Cheap' Dollar" (report to Congress, Congressional Record Services, Washington, DC, October 24, 2007).

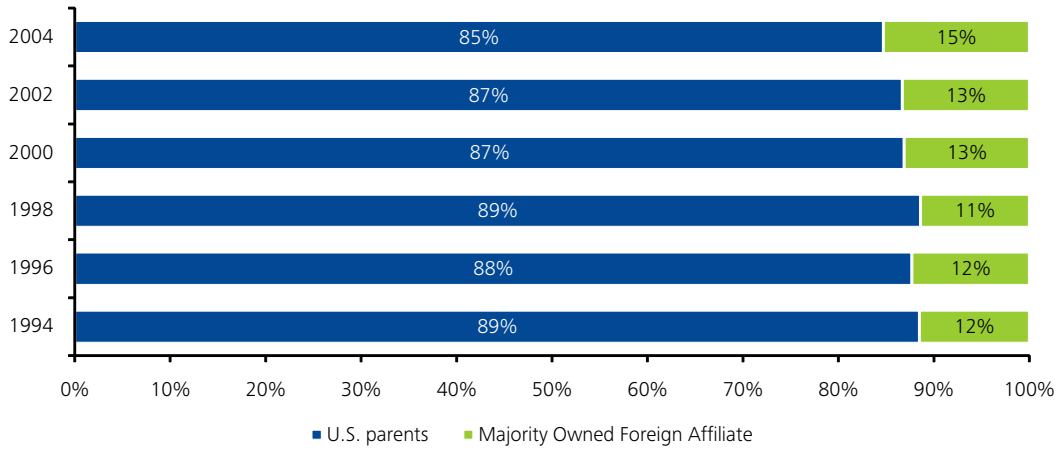
Exhibit 49: U.S. Capital inflows and outflows (1970-2008E)



Source: UNCTAD, Deloitte analysis

Historically, FDI has been viewed as a way to improve efficiency and obtain resource and labor arbitrage, and as means to get privileged access to local markets, which often favor local manufacturers. However, increasingly, firms are taking a more strategic long-term view by approaching FDI opportunities as ways to identify and access pockets of innovation across the globe.

Exhibit 50: R&D performed by parent companies of U.S. multinational corporations and their majority-owned foreign affiliates (1994-2004)



Source: Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad (annual series), http://www.bea.gov/bea/di/di1usdop.htm

As demonstrated in Exhibit 50, the percentage of R&D performed by foreign affiliates of U.S. multinationals had increased from 12 percent in 1994 to 15 percent in 2004 (the latest year the data are available).[72] Moreover, the key sources of R&D are changing (see Exhibits 51 and 52, which compare regional shares of R&D performance by foreign affiliates of U.S. multinationals in 1994 and in 2004). In 1994, Europe held an overwhelming 73 percent of foreign affiliate R&D share. However, in 2004, its share decreased to 66 percent. At the same time, that of the Asia-Pacific region increased from five to 12 percent and that of the Middle East increased from one to three percent.

Regional share of R&D performed by foreign affiliates of U.S. multinationals

Exhibit 51: Year 1994

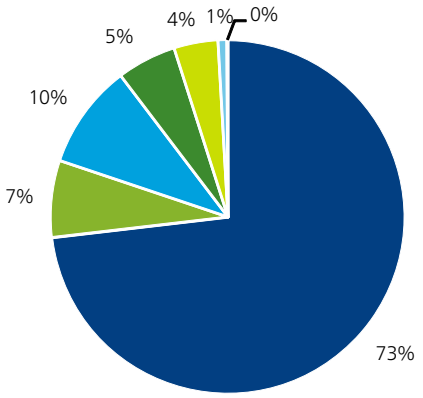
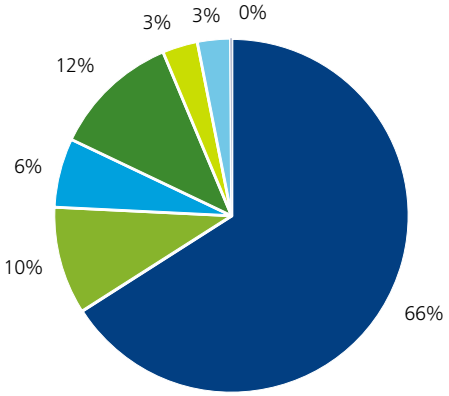


Exhibit 52: Year 2004



Europe ■ Canada ■ Japan ■ Asia/ Pacific excluding Japan ■ Latin America/ OWH ■ Middle East ■ Africa

Source: Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad (annual series), Deloitte analysis

Even though the majority of U.S. companies still view foreign affiliates as a means to short-term efficiency improvements, there are hints of change. As the R&D statistics demonstrate, U.S. firms began viewing their foreign affiliates as sources of product innovations. By placing their R&D centers in emerging markets, these companies are able to tap into diverse packets of talent. Innovations, even in management practice, are no longer confined to developed economies.[73]

Today, developing countries in the Asia-Pacific region grow at a faster rate than developed countries in North America and Europe. These developing countries are emerging sources of talent and innovation, which companies in developed countries should not ignore. For example, true process and management practices innovation referred to as "localized modularization" is demonstrated by the Chinese motorcycle manufacturers in Chongqing and in the apparel industry and by the Hong Kong-based company Li & Fung. Localized modularization is a loosely coupled, modular approach that speeds up a company's time to market, cuts its costs, and enhances the quality of its products. For example, Li & Fung deploys a network of 10,000 specialized business partners to create a customized supply chain for each new apparel line. The core of this management innovation is the ability to build

[72] National Science Board, Science and Engineering Indicators 2008, two volumes (Arlington, VA: National Science Foundation, 2008).

scalable networks of diverse partners that enables Li & Fung to participate in rich knowledge flows and, as a result, drive performance improvement. With this network, Li & Fung built a company of $12 billion in revenue while enjoying double digit revenue growth and achieving high levels of profitability.

Companies go abroad for many reasons, among others, to cut wages (and thus costs), gain access to distinctive skills that accelerate the building of capabilities, and seek new markets.[74] Companies can address a bigger opportunity to learn innovative management practices from the developing world. Managing and scaling a flexible network of diverse partners without running into overhead complexity is just one example. There are many more. To gain the ability to learn and leverage these innovations, companies should view foreign affiliates and partners as sources of new institutional architectures, governance structures, and operational practices.

[73] For further information about emerging market management innovation, see John Hagel III and John Seely, "Innovation Blowback: Disruptive Management Practices from Asia," The McKinsey Quarterly, 2005, no. 1: 35-45.

[74] Vivek Agrawal, Diana Farrell, and Jaana K. Remes,"Offshoring and Beyond," The McKinsey Quarterly, 2003 special edition: Global directions: 24-35.

Worker Passion

Workers who are passionate about their jobs are more likely to participate in knowledge flows and generate value for companies

Introduction

What exactly is worker passion? Passion is not commonly associated with work—most HR research tries to measure "employee satisfaction," which is an entirely different thing. Passion is when people discover the work that they love and when their job becomes more than a mode of income. Passionate workers are fully engaged in their work and their interactions, and they strive for excellence in everything they do. Satisfaction, meanwhile, is a description of how content individuals are with their jobs. Satisfied workers can very easily be content and satisfied with their jobs and yet have no passion for their work. From an employer's perspective, passionate workers are talented and motivated employees. They also tend to be unhappy, however, because they see a lot of potential for themselves and for their companies, but can feel blocked in their efforts to achieve it.

A generation ago, most workers followed a tried and tested path of pursuing a whole career at a single employer—rarely deviating from a single field of expertise. Work was less a pursuit of passion than a means to put food on the table and a roof overhead. They hoped it would earn them enough money to make it possible for them to pursue their passions after work or, if not then, after retirement.

Today's workers are faced with dual forces that will drive a fundamental change in their perceptions about work. Unlike prior generations that often developed a career with a single employer, and enjoyed considerable job stability, today's workers no longer compete only with workers in local labor markets, but, thanks to falling interaction costs,[75] with workers across the globe. As a Silicon Valley billboard put it, "1,000,000 people overseas can do your job. What makes you so special?"[76]

Why does passion matter? Because staying competitive in the newly globalized labor market requires all of us to constantly renew and update our professional skills and capabilities. The effort required to increase our rate of professional development is difficult to muster unless we are passionately engaged with our professional activities.

Generational viewpoints and aspirations regarding the meaning of work must also be taken into account. The Intuit Small Business Report (2008) notes the rapidly changing demographics of small business ownership—they postulate, "Entrepreneurs will no longer come predominantly from the middle of the age spectrum, but instead from the edges. People nearing retirement and their children just entering the job market will become the most entrepreneurial generation ever." Different motivations leading to similar paths, these entrepreneurs will start pursuing their passions as professions and drive a fundamental change in the way we view work.

Our exploration of worker passion is built upon a survey-based study. Over 3,200 respondents were categorized as "disengaged," "passive," "engaged," and "passionate" based on their responses that tested different attitudes and behavior around worker passion: excitement about work, fulfillment from work, and willingness to work extra hours[77]. Other questions in the survey measured aspects of job satisfaction, job search behavior, inter-firm knowledge flows, and the requisite demographic questions that allow for a relational understanding of the most passionate workers.

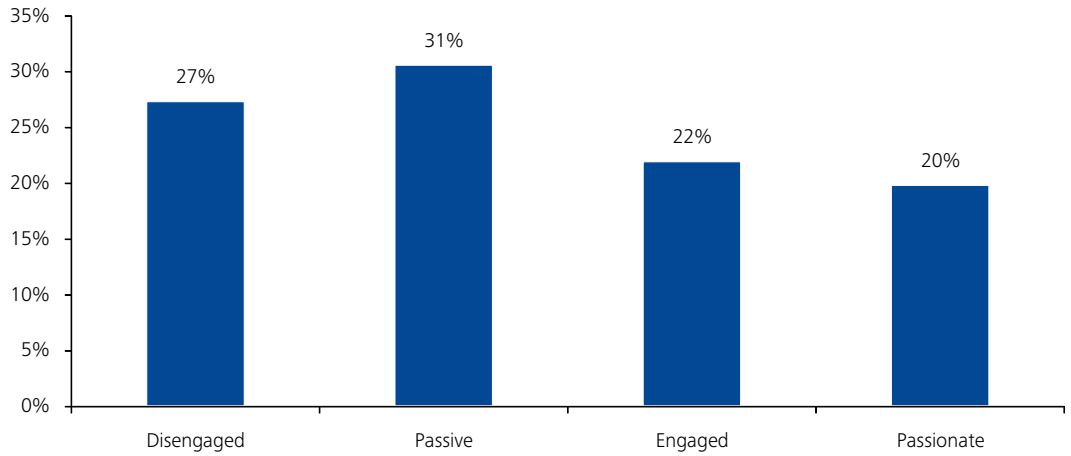
Observations

The overall worker passion score for 2008 in our inaugural study is 20 percent, as shown in Exhibit 53. This indicates the overall percentage of "passionate" employees in the workforce. This number is relatively low, and it would be interesting to monitor the movement of this score and the drivers of this metric over time.

[75] See Patrick Butler et al., "A Revolution in Interaction," The McKinsey Quarterly, 1997, no. 1.

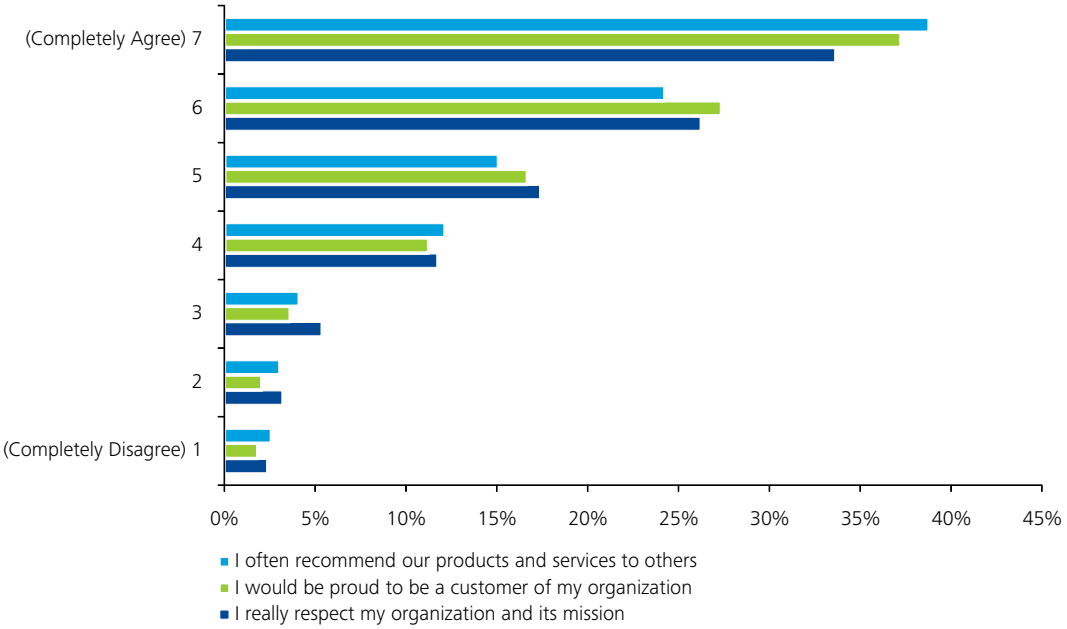
[76] For more about this billboard, see "What Makes You So Special?: With Over 1 Million People in the World Able to Do Your Job, Altium Acts to Help More," Reuters, http://www.reuters.com/article/pressRelease/idUS180975+20-Apr-2009+MW20090420 (created April 20, 2009).

Exhibit 53: Worker Passion (2008)



Source: Synovate, Deloitte analysis

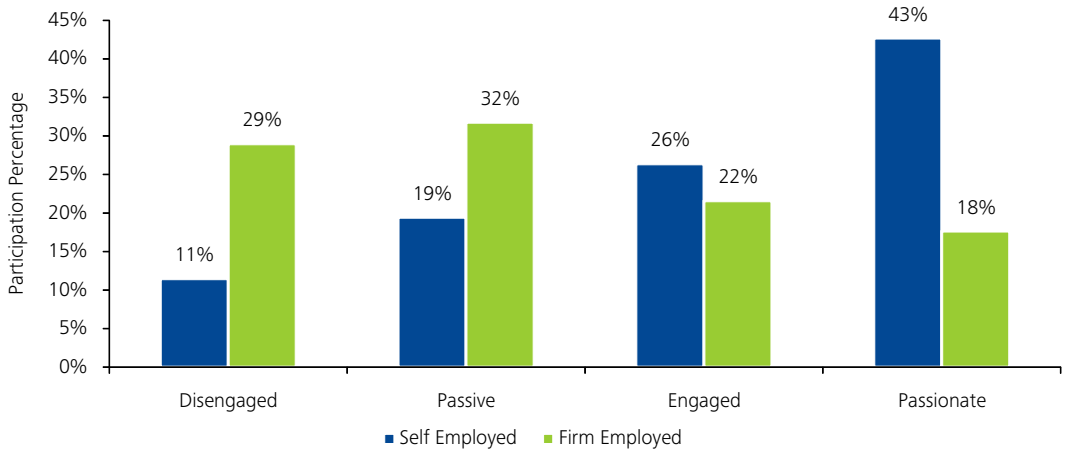
Exhibit 54: Worker satisfaction at firm employed (2008)



Source: Synovate, Deloitte analysis

One initial finding from the survey suggests that a significant portion of respondents are satisfied with their current companies, even if they are not passionate about them. Exhibit 54 displays three measurements of job satisfaction in which over 60 percent of the respondents strongly agree (top two levels of agreement) to each of the three criteria. This is in agreement with other comparable studies and may also be an inflated reaction to the current economic environment and its high unemployment levels. The annual Job Satisfaction Report for 2008 from the Society for Human Resource Management (SHRM) notes that job security was the most important aspect of employee job satisfaction and the importance of work/life balance recorded its lowest level since the inception of the survey in 2002.

Exhibit 55: Worker Passion by employment type (2008)

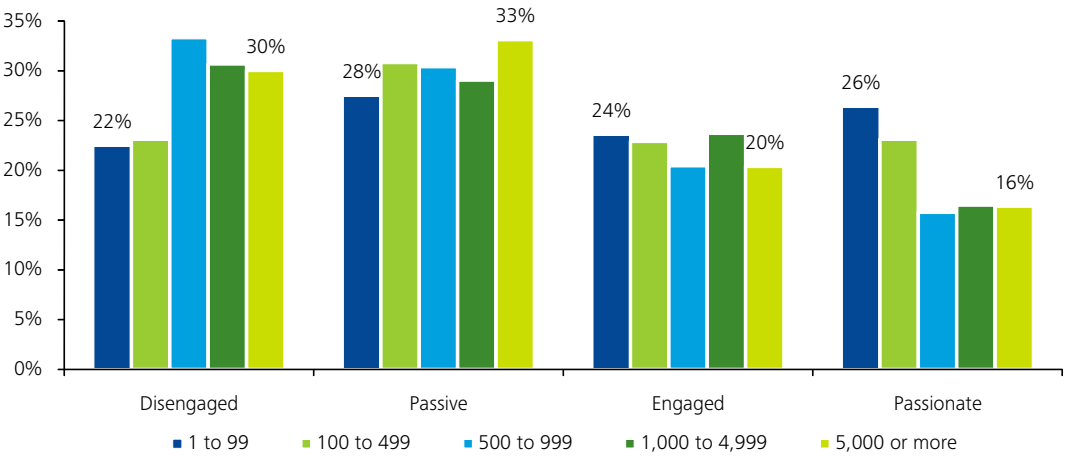


Source: Synovate, Deloitte analysis

However, we also find that very few (only 20 percent) are "passionate" about their jobs, as shown in Exhibit 55. This dichotomy draws a distinction between those who are passionate about the work they do and those who are satisfied to have a job and are generally happy with what they do. Our intent was to focus on those that are the most passionate—since we believe this passionate segment will be best able to increase their rate of learning to keep pace with the rapid pace of technological evolution driving today's Big Shift.

Delving deeper into the passionate workers, we find that the self-employed are far more passionate about their work (43 percent of self-employed are passionate vs. 18 percent of the firm employed), as compared to those employed at companies. This is intuitive, given the overlap in drivers of passion and the motivations of the self-employed: autonomy, meaningfulness of work, and more intimate interactions in all business transactions. However the impact of this finding is magnified by other underlying trends driven by the Big Shift: increasing interest in entrepreneurship and growth of the contract worker segment.

Exhibit 56: Worker Passion by size of firm (2008)



Source: Synovate, Deloitte analysis

An extension of this analysis, shown in Exhibit 56, indicates that smaller companies also have more passionate workers than larger companies. The two factors underlying the relationship between self-employment and/or company size and passion for work are autonomy and opportunities for growth provided by a less constrained work environment. This thesis is supported by the open-ended commentary in the survey: In the open-ended responses, 24 percent responded that flexibility, freedom, and autonomy were the reasons they "loved their job." Similarly, 23 percent of the respondents cited challenges and opportunities for problem solving and creativity as the reasons they loved their job. Some quotes from the passionate give life to these themes:

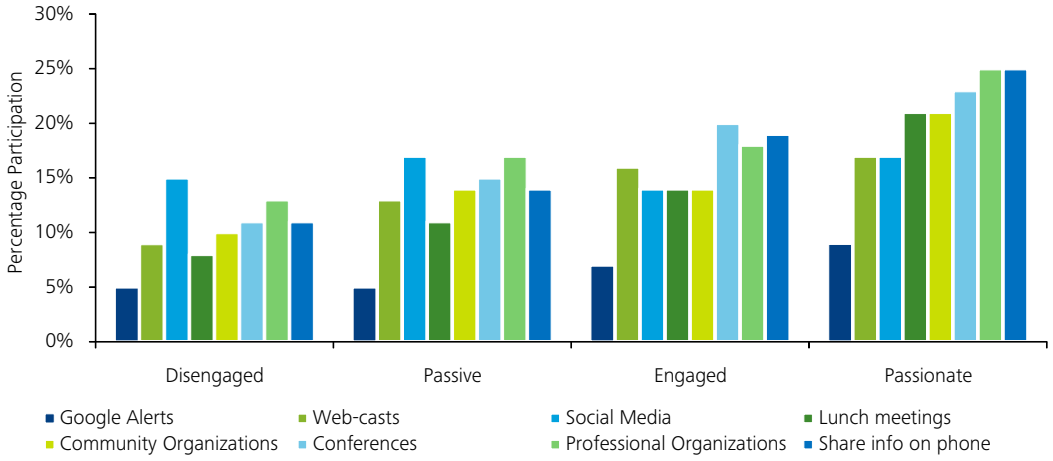
- "I'm in control. I am good at and love to solve problems. I report to no one except myself. I am able to be creative. I love working with people" (self-employed, media and entertainment industry).
- "It's extremely challenging, supports energy independence for our country, and involves finding solutions to critical problems" (middle management, energy industry).

Another key observation from the study was that the passionate participate in more inter-firm knowledge flows than others (Exhibit 57). This is a reflection of the passionate being more engaged in their work and being willing and wanting to learn and participate in knowledge flows to ultimately perform better at their jobs.

In a world driven by the twin forces of technology infrastructure and public policy shifts, the primary source of value creation for companies is moving from accumulating and exploiting "stocks" to participating in "flows" of knowledge. This activity takes place primarily through talented workers, who monetize the intangible assets that now account for the lion's share of profits at big companies in the developed world.[78] Since passionate workers have a greater propensity to participate in knowledge flows, it makes sense for companies to find ways to increase the amount of passion workers find in and bring to their jobs.

[78] See Lowell Bryan and Michele Zanini, "Strategy in an Era of Global Giants," The McKinsey Quarterly 2005, no. 4.

Exhibit 57: Participation in Inter-Firm knowledge flows by type of worker (2008)



Source: Synovate, Deloitte analysis

Talented workers join companies and stay there because they believe they will learn faster and better than they would with other employers. Only by helping employees build their skills and capabilities can companies hope to attract and retain them.

One important caveat is that attracting talent and tapping employee passion is not limited to knowledge workers as we conceptualize them today. Peter Drucker initially defined a "knowledge worker" as "one who works primarily with information or one who develops and uses knowledge in the workplace." However, as employees at all levels and roles increasingly participate in knowledge flows to perform their work, they will essentially all become knowledge workers. This transformation in our workplace requires new rules on managing and retaining talent, which we explain in more detail in the Returns to Talent metric in the Impact Index section.

Social Media Activity

The recent burst of social media activity has enabled richer and more scalable ways to connect with people and build sustaining relationships that enhance knowledge flows

Introduction

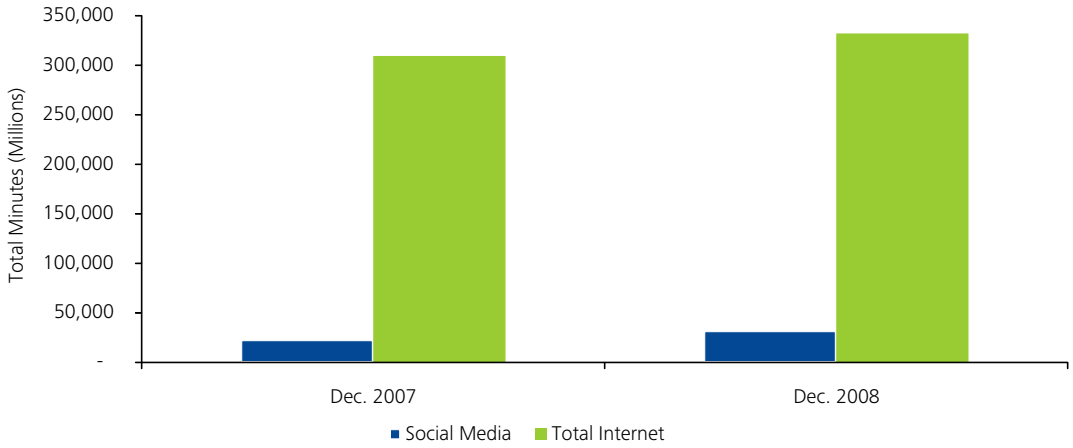
comScore defines social media as "a virtual community within Internet websites and applications to help connect people interested in a subject." Social media sites offer a way for members to communicate by voice, chat, instant messages, videoconference, and blogs. These groups of people use a variety of tools, such as email, messaging, and photo sharing to connect and exchange information. Hundreds of millions of people around the world are online, and a significant portion of them are engaged in social media, trying to enrich both personal and business relationships. Because it supports and organizes information sharing and rich interaction, social media is an important amplifier of knowledge flows and thus an essential metric in the Shift Index.

The Social Media Activity metric quantifies the number of minutes users are spending on social media sites as a percentage of total minutes spent online. We draw on data from comScore's Media Metrix, which tracks approximately 300 of the most popular social media sites.[79]

Observations

As shown in Exhibit 58, during the past 24 months, total minutes spent on social media sites as a percentage of total minutes spent on the Web have grown from seven to 10 percent, a 30 percent increase.

Exhibit 58: Social Media Activity (2007-2008)



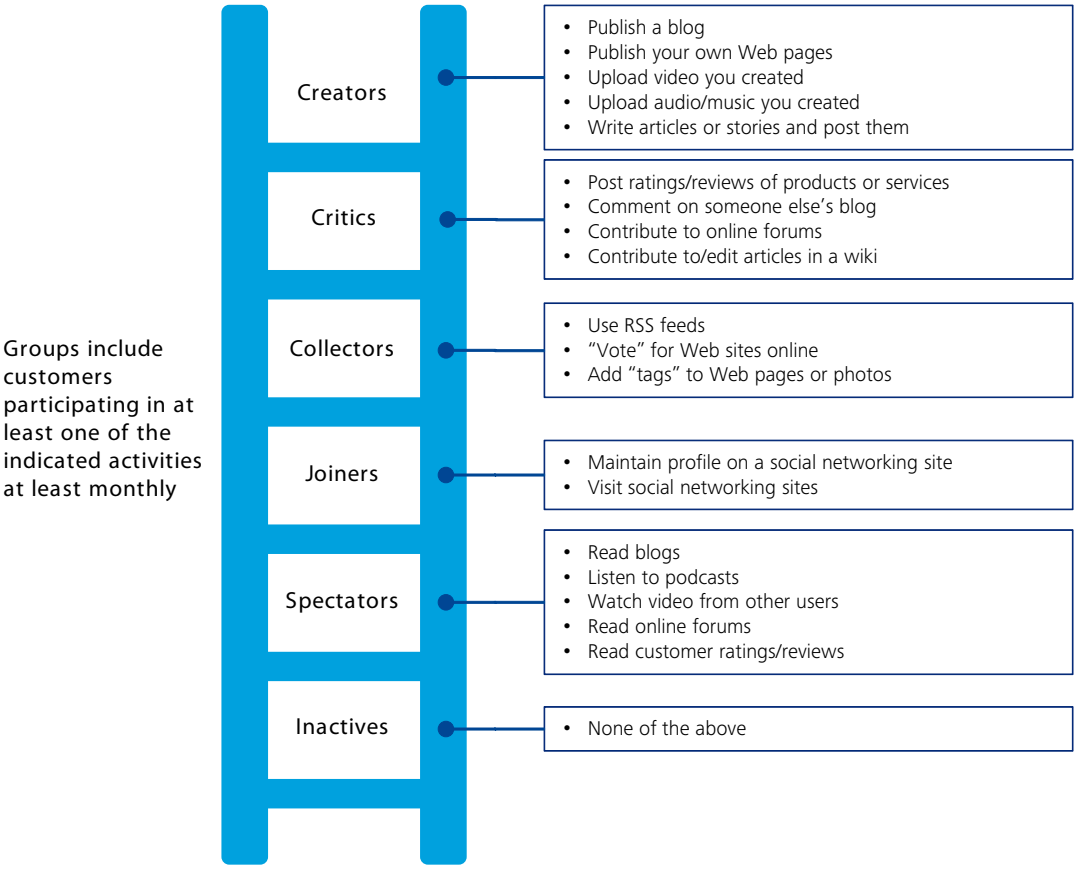
Source: comScore, Deloitte analysis

[79] For further information, please refer to the Shift Index Methodology section.

Between 2007 and 2008, total minutes spent on the Internet increased by seven percent. By comparison, minutes spent on social media sites jumped 40 percent, and their average daily viewers grew from 42 million in 2007 to 62 million in 2008. This growth is also apparent when looking at the average monthly usage days per visitor to sites in the social media category, which increased from 10.7 in 2007 to 14.2 in 2008.

A recent report by Forrester, highlighting social networking adoption trends, showed that the percentage of people in the United States who have used social networks grew to 49 percent in 2008, up from 33 percent in 2007.[80] Another report discussed the concept of Social Technographics® (a method of benchmarking consumers by their level of participation in social computing behaviors) and metaphorically used a ladder to help visualize the concept (shown in Exhibit 59)—the higher the rung, the more involved the participation.[81] According to Forrester, people are playing an increasingly active role in their social media experience as indicated by a growth in all "profiles" except for "inactives" (those who do not participate in social media at all), which decreased by half from 2007 to 2008, as shown in Exhibit 60. The online individual is no longer a passive bystander: People are immersed, actively participating as creators who write blogs, make Web pages, and update online content. Society has embraced social media as a means of expression and a creative outlet.[82]

Exhibit 59: Social Technographics Ladder



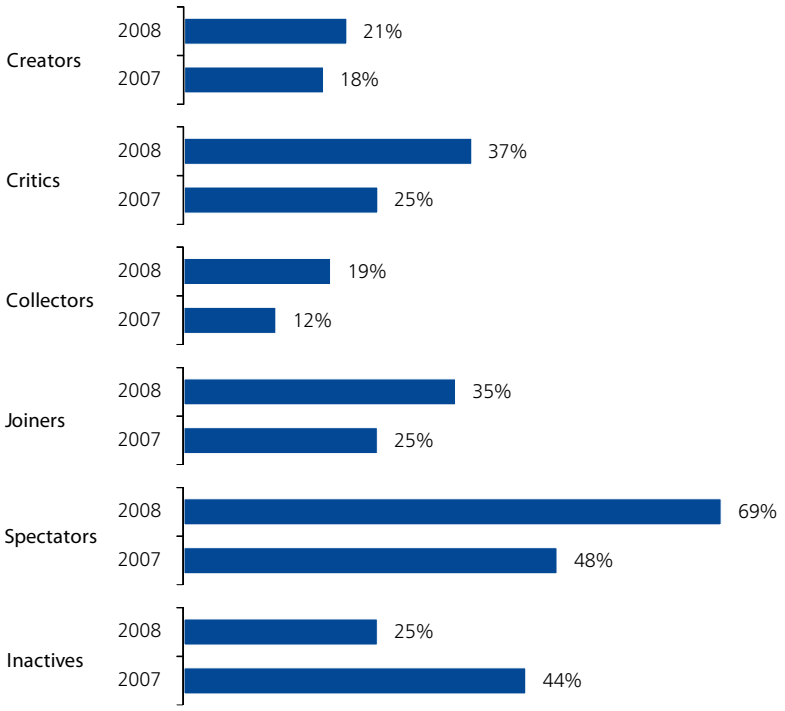
Source: Forrester Research Inc.

[80] Owyang, Jerimiah K. "The Future of The Social Web". Forrester Research, Inc. April 27, 2009 <http://www.forrester.com/Research/Document/Excerpt/0,7211,46970,00.html>.

[81] Bernoff, Josh. "The Growth of Social Technology Adoption". Groundswell. February 23, 2009 <http://blogs.forrester.com/groundswell/data/index.html>.

[82] Ibid.

Exhibit 60: Social Technographics profile of U.S online adults (2008)



Source: Forrester Research Inc.

Technological advancements, as previously discussed in this report, have also allowed social media platforms to serve as catalysts for open innovation. For example, 52,000 applications are currently available on the Facebook platform with more than 70 percent of Facebook visitors using them. More broadly, social media platforms have spurred new technologies, including blogs, picture-sharing, vlogs, wall-postings, email, instant messaging, music-sharing, crowd sourcing, and voice over IP, to name a few.[83] These technologies amplify knowledge flows by making them richer and more personalized.

Time spent on social media as a percentage of total time on the Internet is increasing. That means the World Wide Web is evolving into not only a network of information but also a network of people. This network is changing how people connect and interact with one another, blurring the lines between personal and professional and forcing business leaders to rethink how to best engage employees and consumers.

To make the most out of this new environment, companies should provide their employees with appropriate guidance and governance on how to participate in knowledge flows. They can also use pull approaches as a new way to interact with consumers. Collaboration marketing, for example, acknowledges newly powerful consumers by focusing on a company's ability to attract (create incentives for people to seek you out), assist (be as helpful and engaging as possible), and affiliate (mobilize and leverage third parties).

[83] "Social Media," Wikipedia, http://en.wikipedia.org/wiki/Social_media (last modified June 8, 2009).

2009 Impact Index

84 **Competitive Intensity:** Competitive intensity is increasing as barriers to entry and movement erode under the influence of digital infrastructures and public policy

87 **Labor Productivity:** Advances in technology and business innovation, coupled with open public policy and fierce competition, have both enabled and forced a long-term increase in labor productivity

90 **Stock Price Volatility:** A long-term surge in competitive intensity, amplified by macro-economic forces and public policy initiatives, has led to increasing volatility and greater market uncertainty

92 **Asset Profitability:** Cost savings and the value of modest productivity improvement tends to get competed away and captured by customers and talent

95 **ROA Performance Gap:** Winning companies are barely holding on, while losers are rapidly deteriorating

97 **Firm Topple Rate:** The rate at which big companies lose their leadership positions is increasing

99 **Shareholder Value Gap:** Market "losers" are destroying more value than ever before – a trend playing out over decades

101 **Consumer Power:** Consumers possess much more power, based on the availability of much more information and choice

104 **Brand Disloyalty:** Consumers are becoming less loyal to brands

107 **Returns to Talent:** As contributions from the creative classes become more valuable, talented workers are garnering higher compensation and market power

111 **Executive Turnover:** As performance pressures rise, executive turnover is increasing

2009 Impact Index

111

Foundations and knowledge flows are fundamentally reshaping the economic playing field

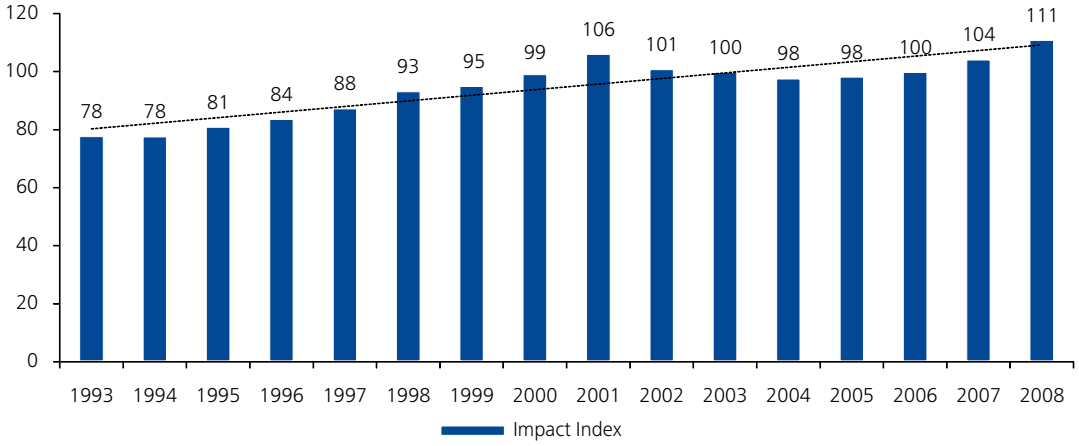
Trends set in motion decades ago are fundamentally altering the global landscape as a new digital infrastructure, built on the sustained exponential pace of performance improvements in computing, storage, and bandwidth, progressively transforms the business environment. The Foundation Index and the Flow Index are meant to capture this dynamic, while the Impact Index shows how and why it all matters. The Impact Index is a lagging indicator of how foundational shifts and new flows of knowledge are tangibly changing the way companies and consumers operate.

By our calculations, ROA for public companies has decreased to one-quarter of its level in 1965. While this deterioration in ROA has been particularly affected by trends in the financial sector, significant declines in ROA have occurred in the rest of the economy as well. Also, when you look at the best companies—the top 25 percent of earners—even they have barely held their ground. Clearly, there is a fundamental disconnect between the mind-set and practices of companies and the environment in which they compete. Here's why:

- Aided by technology, interaction costs are plummeting, and public policy has enabled freer movement by eroding the barriers that once protected incumbents. At the same time, the economy itself has "gone digital" and is increasingly service based, meaning that companies need fewer assets to effectively compete. These shifts have led to rapidly intensifying competition, which has more than doubled since 1965.
- As mentioned briefly above, this competition has taken an extreme and consistent toll on profits. By comparing net income and assets, we see that economy-wide profitability is significantly lower than what it was in 1965.
- In addition, economic and shareholder returns are increasingly polarized. During the past 40 years, the best firms (those in the top quartile of performers) have barely held their ground, only marginally increasing their profitability and shareholder returns. The worst performers, however, have seen their percentage losses for both more than double. Today, the costs of falling behind are at their highest point in decades, and the purely defensive nature of scale-based corporate strategy has never been more clear.
- At the same time, as returns were bifurcating but generally on the decline, management innovations and technology have enabled workers and companies to be more productive. As measured by the Bureau of Labor Statistics, the productivity of labor has more than doubled since 1965. This begs a fundamental question: If not captured by firms, where did this value go?
- It appears that the bulk of it has been captured by consumers and talent, who have learned to harness the power of digital infrastructure much more quickly than their institutional counterparts. Deloitte's inaugural survey of Consumer Power indicates that consumers wield significant power with a score of 67 out of 100—put simply, this means that companies have to deliver more and more value at what is often a lower price. Meanwhile, we see that the total compensation of creative class occupations is, on average, more than double that of other occupations. Moreover, the compensation gap between the creative class and the rest of the workforce has been increasing, at a four percent CAGR during the past six years, suggesting the increasing importance companies place on talent. By participating in knowledge flows, creative talent is capturing an increasingly larger share of the economic pie.

Traditional, scale-based strategies have provided little sustained relief from these trends. Instead, companies are toppling from their leadership positions at nearly double the 1965 rate, and executives, using 20th-century strategies to address 21st-century problems, are seeing their tenures decline.

Exhibit 61: Impact Index (1993-2008)



Source: Deloitte analysis

Taken together, these findings suggest a fundamental re-thinking of the way we do business is in order. Success in the digital era will be defined by how well companies share knowledge—how well they leverage foundations and participate in flows. In a constantly changing, highly uncertain world, the value of what companies know today is rapidly diminishing; new measures of success must be based on how fast they can learn. In this sense, we must transition from scalable efficiency to scalable learning, as mentioned a number of times in this report. Our hope is that the findings above, revealed by the Impact Index, tangibly quantify the imperative for this shift.

Rather than a cause for pessimism, these findings can be viewed as an opportunity to remake the institutional architectures of today's corporations. Companies in the early-20th century learned to exploit the benefits of scale in response to the energy, transportation, and communications infrastructures of their time. Today's companies must develop and adapt institutional innovations of their own if they are to make the most of this era's emerging digital infrastructure. Once these innovations are sufficiently diffused through the economy, the Impact Index will turn from an indicator of corporate value destruction to a reflection of powerful new modes of economic growth.

The Index

Today, the Impact Index score is 111, as shown in Exhibit 61. Note that this index measures the impact of the Big Shift: So as competitive pressures force down returns, as markets become more volatile, or as brand loyalty erodes, the index will increase.[84]

In this sense, to decide whether a decrease in a metric (such as profitability) should increase the index, we had to make a guess as to which direction it would go—at least in the short term—in response to the Big Shift. These decisions were made in accordance with our logic (that competition will put growing pressure on returns) and long-term trends (that returns have been steadily declining since 1965). However, as we predict above, there will come a time when companies learn to harness the new digital infrastructure and generate powerful, new modes of economic growth. At that time, the way many of these metrics contribute to the index (that is, positively or negatively) will have to be reassessed.

[84] For further information on how the Impact Index is calculated, please refer to the Shift Index Methodology section.

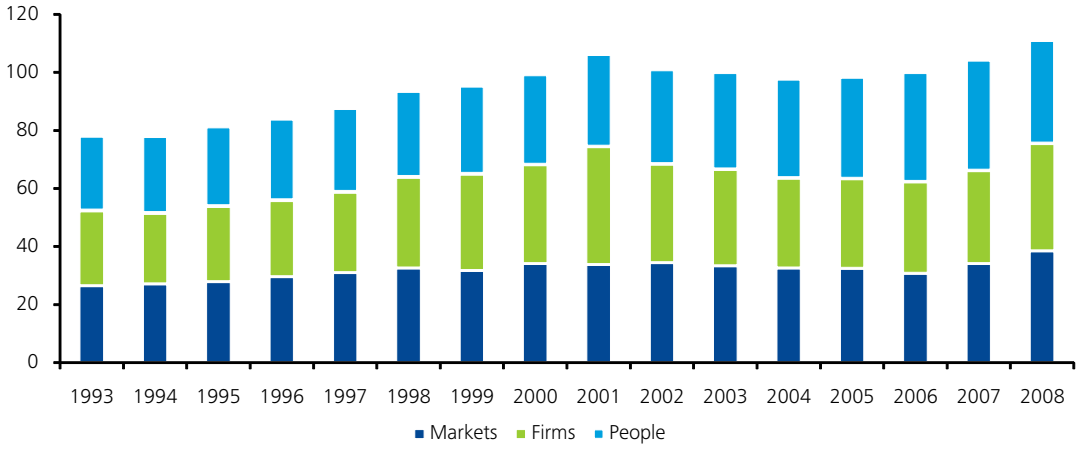
As with the Foundation Index and the Flow Index, this index is broken down into three drivers. In this case, these drivers are designed to quantify the impact of the Big Shift on three key constituencies:

- **Markets**
  The impact of technological platforms, open public policy, and knowledge flows on market-level dynamics facing corporations. This driver consists of three metrics: Stock Price Volatility, Labor Productivity, and Competitive Intensity.
- **Firms**
  The impact of intensifying competition, volatility, and powerful consumers and talent on firm performance. This driver consists of four metrics: Asset Profitability, ROA Performance Gap, Firm Topple Rate, and Shareholder Value Gap.
- **People**
  The impact of technology, open public policy, and knowledge flows on consumers and talent, including executives. This driver consists of four metrics: Consumer Power, Returns to Talent, Brand Disloyalty, and Executive Turnover.

Individually, these drivers tell us how the Big Shift has affected key groups over time. Collectively, as shown in Exhibit 62, they describe how rapid changes in the Foundations and Flows are altering the dynamics between companies, customers and the markets in which they operate.

Right away, we can tell that the Impact Index has not grown as consistently as the Foundation Index and the Flow Index. This is to be expected: Unlike the latter two, the Impact Index is particularly susceptible to short-term cyclicality, as it is based on a number of financial measures that fluctuate over time. As such, we made an attempt to smooth the data to represent long-term trajectories more clearly relative to short-term movements.[85]

Exhibit 62: Impact Index drivers (1993-2008)



Source: Deloitte analysis

[85] For further information on data smoothing, please refer to the Shift Index Methodology section.

Exhibit 63: Markets (1993-2008)

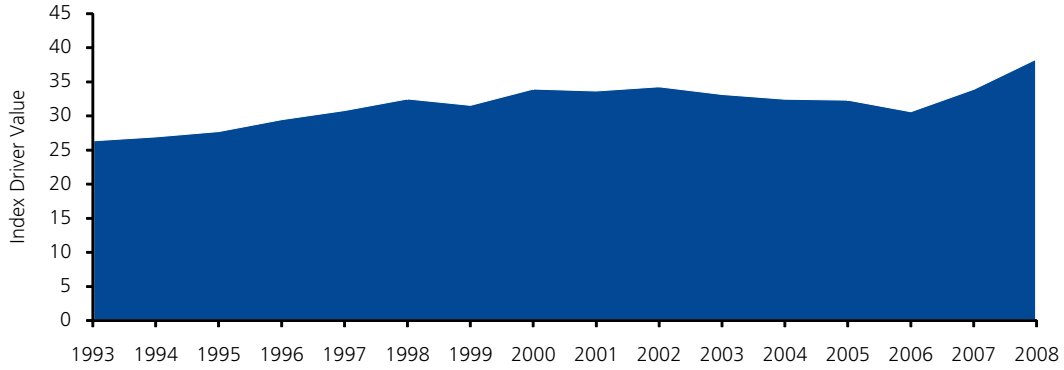


Exhibit 64: Firms (1993-2008)

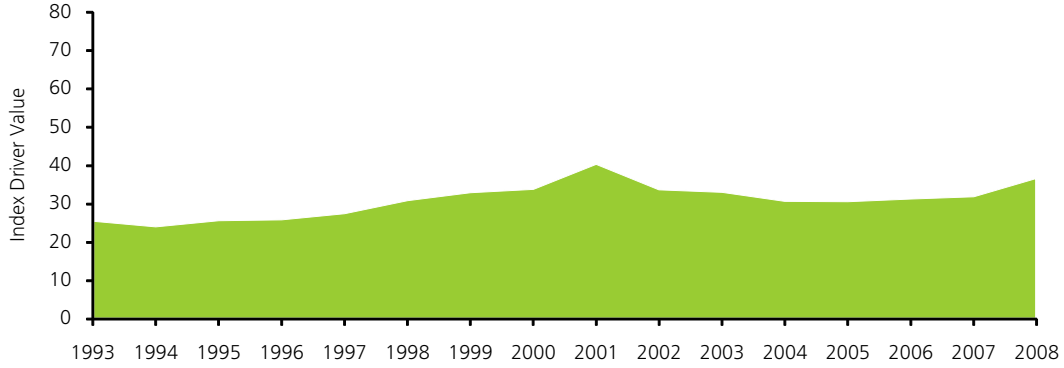
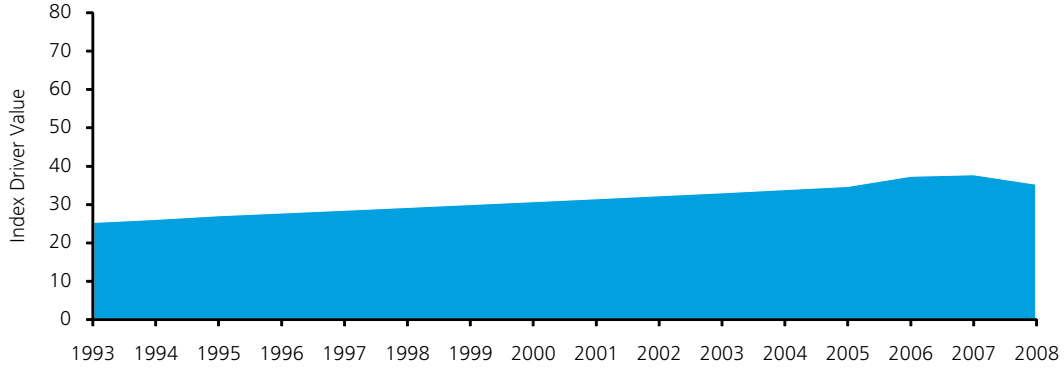


Exhibit 65: People (1993-2008)



Source: Deloitte analysis

The chart above represents the combined movements of the underlying metrics in the index, after data adjustments and indexing to a base year of 2003. For more information on the Index Creation process, see the Methodology section of the report.

After doing this, we see that growth in this index is much slower than in the Foundation Index or Flow Index: It has grown at a CAGR of 2.4 percent since 1993. The reason for this is that, at least right now, the underlying metrics in the Impact Index do not move as fast as, say, increases in computing power. But we do expect the index to keep growing—perhaps at an even faster rate—as companies begin to adapt their institutional architectures and business practices to more effectively harness the potential of the digital infrastructure and richer knowledge flows.

Slower growth does not mean that movements in this index are of less importance. Shifts, albeit small, in the Impact Index are indicative of powerful trends, many of which were discussed in the previous section. For example, where we are today (an index value of 111) is the result of parallel growth in the impact of the Big Shift on all three constituencies: Markets, Firms, and People. The impact on Markets, a reflection of growing competitive intensity, labor productivity, and volatility in stock prices, has gone up more than 45 percent since 1993, as shown in Exhibit 63. Since 1993, it has grown at roughly a 2.5 percent CAGR each year. As companies learn to harness the new digital infrastructure and knowledge flows to become more productive and more effectively compete, we expect this to not only continue but also increase significantly. The economic downturn may also have a lasting effect on these dynamics. Again, "normal" may in fact be a thing of the past.

The impact at the firm level—shown in Exhibit 64—is highly telling. Despite an obsessive focus on tenets of traditional, scale-based corporate strategy—cut costs and acquire others to achieve industry leadership and to capture economies of scale—the pressures in the Markets driver impact Firms nearly one to one. Since 1993, the Firms driver, which measures the negative impact of the Big Shift on individual companies, has grown a full 43 percent, at a CAGR just shy of 2.5 percent. The similarity to increases in market pressures, despite aggressive efforts to offset them, is striking. If companies do not catch up in their ability to harness the new digital infrastructure, they will see their performance continue to deteriorate (perhaps even more quickly) as competition inevitably grows steeper. Unfortunately, we are forced to make assumptions when it comes to the impact of the Big Shift on People because our way of measuring this through a recent survey precludes us from assessing historical trends (Exhibit 65 represents an estimate). But understanding that changes in digital technologies and practices tend to impact individuals before institutions, we can be confident that people have been impacted the most and the most consistently by the Big Shift. As technology continues to reshape the playing field and put power in the hands of consumers and talent, we expect this driver to increase.

Overall, we expect the Impact Index to increase at a growing rate over the coming years, but with much more volatility than the Foundation Index or the Flow Index. As individuals continue to outpace institutions in the value they gain from technology, the broad competitive forces degrading performance will only increase and, with them, the index, until firms finally develop the institutional architectures and business practices required to more effectively create and capture economic value.

Competitive Intensity

Competitive intensity is increasing as barriers to entry and movement erode under the influence of digital infrastructure and public policy

Introduction

Many executives have the sense that the world is more competitive today than ever before. Indeed, consultants and academics alike have argued and tried to prove the same hypothesis.[86] We chose to include a proxy for competitive intensity in the Shift Index as a way of measuring the falling barriers to entry and movement resulting from digital technology and public policy changes.

During the last several decades, public policy liberalization has opened up the global economy, allowing freer flow of capital across geographical and institutional lines. Businesses now find it easier to enter and exit markets, industries, and countries, and workers enjoy fewer restrictions on where they can work.

Meanwhile, digital technology has removed previous barriers to the free flow of information, eroding the information asymmetries that once favored sellers over buyers. Indeed, as described later in this report, today's consumers have a growing wealth of knowledge and choice when buying goods and services and a loose attachment to brands. The shift in market power from makers of goods and services to the people who buy them continues to raise the pressure on firms to innovate and sell in new and creative ways.

Many of today's companies continue to follow traditional scale-based notions of corporate strategy, pursuing mergers and acquisitions to achieve industry leadership, focusing tirelessly on cost reduction, and making every effort to squeeze value from the channel. As quickly as they accomplish these things, however, competitors enter with new efficiencies and ideas. Even the best firms struggle to stay ahead.

Observations

There is no single, widely agreed upon way to measure competition. The Shift Index uses a measure called the Herfindahl-Hirschman Index, or HHI, which tracks changes in industry concentration by measuring the market share held by the top 50 firms. Concentration and competition are not the same thing, of course, and HHI is a thus very rough proxy. They are sufficiently related, however, to allow one to draw relevant, even if rough, conclusions about changes in competitive dynamics over time.

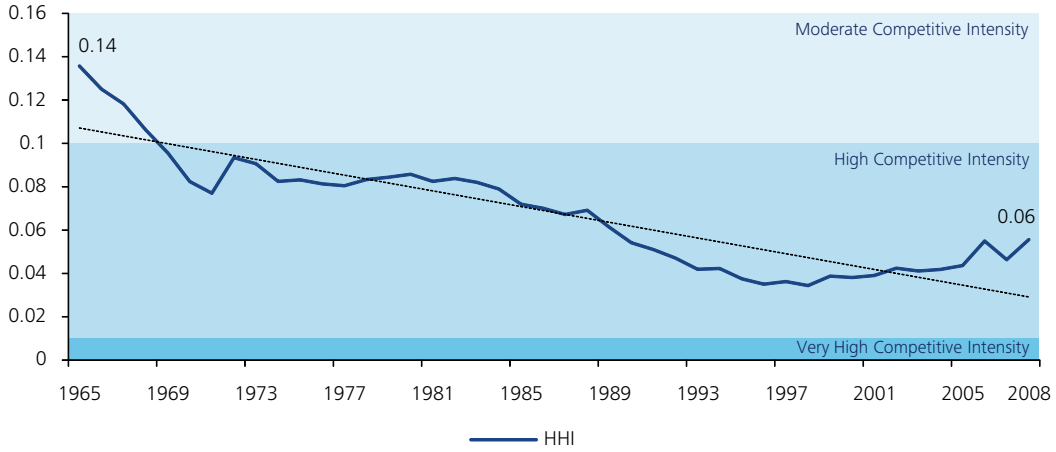
To illustrate how this works, imagine an industry with high fixed costs of production. These costs (to build and operate factories, for example) are barriers to entry that enable a small group of players to win the lion's share of sales. According to HHI, market power is highly concentrated in this industry, and by correlation, it is relatively uncompetitive. At the same time, consider the converse state of affairs, in which barriers are low and sales are spread evenly across a large number of firms. HHI would predict this industry to be much more competitive because more players have a greater chance—and imperative—to compete for customer business.

Of course, this framework breaks down in a number of situations, and comparing industries with different structural characteristics using HHI is problematic. Overall, however, longitudinal shifts in this metric provide a good indicator for how competitive intensity has changed over time.

[86] See, for example, William L. Huyett and Patrick Viguerie, "Extreme Competition," *The McKinsey Quarterly*, 2005, no. 2 and Richard D'Aveni, *Hyper-Competition* (New York: Free Press, 1994).

Exhibit 66 plots HHI from 1965 to 2008.[87] Before 1995, industry concentration decreased consistently, indicating that competitive intensity was steadily increasing. Despite a brief resurgence in recent years, market concentration is less than half of what it was in 1965—suggesting that competitive intensity has more than doubled in the same period.

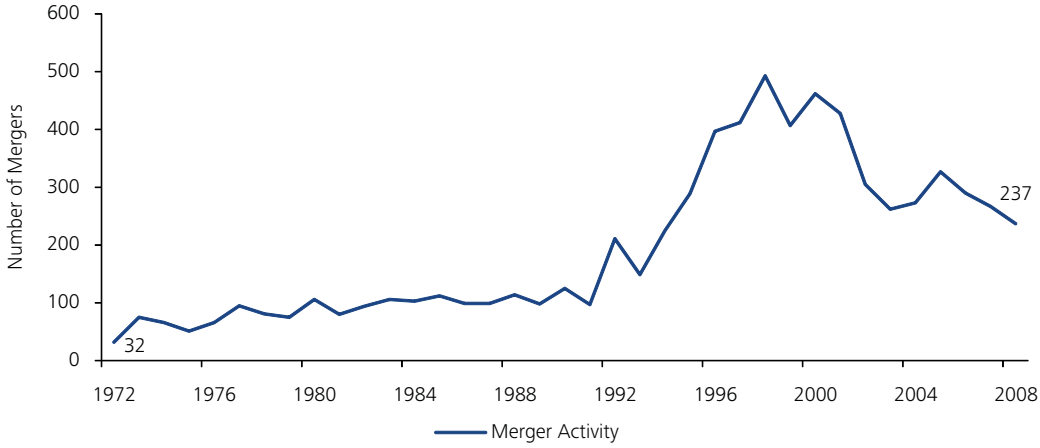
Exhibit 66: Economy-wide Herfindahl-Hirschman Index (HHI) (1965-2008)



Source: Compustat, Deloitte analysis

Additionally, worth noting is that HHI values between 0 and 0.10 denote low industry concentration and by extension high competitive intensity. Throughout almost the entire period under analysis, the United States has fallen in that range. While competition is increasing, it has certainly always been intense.

Exhibit 67: Economy-wide merger activity (1972-2008)



Source: CRSP US Stock Database ©200903 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business, Deloitte analysis

[87] Compustat, Deloitte analysis.

As mentioned above, our methodology suggests that competitive intensity has eased in recent years. This is not something we attribute, however, to a decline in competition, but, rather, to a wave of mergers and acquisitions (shown in Exhibit 67) that have increased industry concentration and thus HHI.[88] Technically, this is a situation where our methodology breaks down: In a given year, HHI might "get it wrong" because of heavy mergers and acquisitions. But over the long term, we actually view this behavior as a response to increasing competitive intensity and, consequently, do not see it as a threat to the validity of our metric. To explain, executives, seeking to defend their company's position, acquire competitors both to reduce near-term pressure and to squeeze out more costs through greater economies of scale. However, if barriers to entry and barriers to movement continue to erode as a result of continued digital infrastructure advances and public policy shifts favoring greater liberalization, we expect that these defensive moves will only have short-term impacts until another wave of competitors emerge to challenge incumbents. So even if over a few years, HHI increases due to mergers and acquisitions, we believe the long-term trend is highly indicative of a tectonic shift toward increasing competitive pressure.

The profound increase in competitive intensity since the mid-1960s shows no sign of slowing and should provide considerable impetus for businesses to rethink traditional strategic, organizational, and operational approaches—away from the scalable efficiency that was the principal rational for the 20th century toward the scalable learning and performance better suited for today's environment. For more regarding this point of view, please refer to the Implications for Business Executives section.

[88] Deloitte analysis based on historical data from *CRSP US Stock Database* ©200903 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business.

Labor Productivity

Advances in technology and business innovation, coupled with open public policy and fierce competition, have both enabled and forced a long-term increase in labor productivity

Introduction

Robert Solow once famously said, "You can see the computer age everywhere but in the productivity statistics."[89] Often referred to as the productivity paradox, this notion states that big investments in information technology have had little influence on long-term increases in labor productivity.

A central hypothesis of the Big Shift is that digital technology, as it increasingly penetrates business and social domains, holds the potential to unleash substantial increases in the rate of productivity growth. In this view, the fact that technology has yet to make its mark on productivity may say more about traditional institutional architectures and management practices than about what is possible in the future as companies come to better terms with the Big Shift.

Traditional approaches to productivity improvement too often focus on manipulating inputs—the denominator, or cost, side of the productivity ratio. Since companies can only reduce costs so far before reaching zero, this is ultimately a diminishing returns game. The fixation on inputs, moreover, overlooks a bigger opportunity: the potential to sell more with the same amount of cost.

By focusing on "revenue productivity," executives can switch from wringing out ever-more elusive efficiency gains to unleashing the potential of employees by increasing the rate at which they learn, leading to innovation and continuous performance improvement. We believe there is tremendous opportunity to couple the digital infrastructure with new management approaches to empower, create, and mobilize the knowledge workers possess to monetize the intangible assets that make up the lion's share of company profits in the digital era.

We obtained our economy-wide productivity data from the Bureau of Labor Statistics.[90] This measure describes the relationship between real output and the labor time involved in its production—it shows the changes from period to period in the amount of goods and services (GDP) produced per hour worked. In other words, labor productivity is simply defined as a measure of economic efficiency which shows how effectively economic inputs are converted into outputs. Advances in productivity, that is, the ability to produce more with the same or less input, are a significant source of increased potential national income.[91]

Observations

The U.S. sector as a whole has been able to achieve modest productivity gains since 1965. As shown in Exhibit 68, the upward secular trend is apparent, suggesting that in the face of steadily increasing competitive pressures, companies have been able to achieve productivity growth.

While the chart above depicts fairly consistent growth over time, Exhibit 69 suggests that the rates of growth over the past five decades have varied.[92]

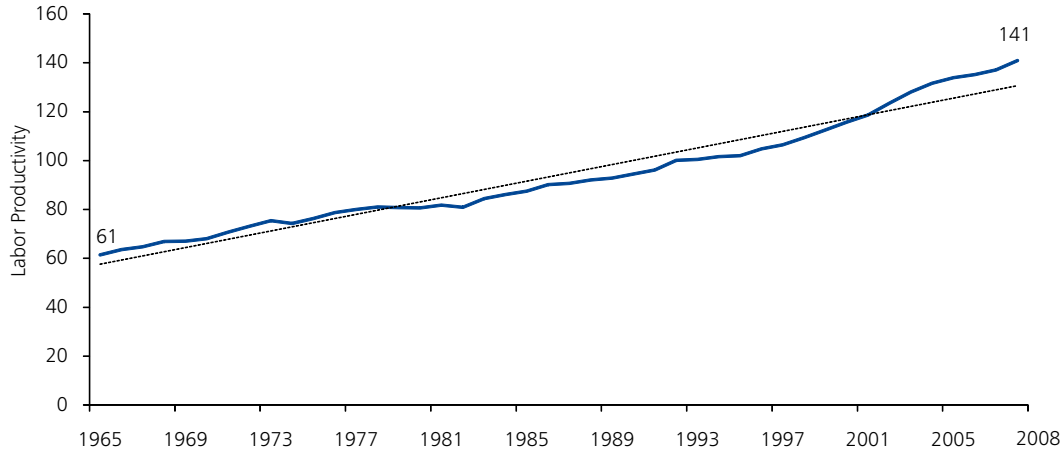
[89] Robert Solow, *New York Review of Books*, July 12, 1987.

[90] In this study, "economy-wide" refers to the U.S. nonfarm business sector. Nonfarm business sector output is constructed by excluding from GDP the following outputs: general government, nonprofit institutions, private households, and farms; it is published by the Bureau of Economic Analysis at the same time as (or in conjunction with) GDP. Corresponding exclusions are made in labor inputs by BLS. Nonfarm business output accounted for about 76 percent of the value of GDP in 2008

[91] Bureau of Labor Statistics, "Labor Productivity and Costs". United States Department of Labor. June 14, 2009 <http://www.bls.gov/lpc/faqs.htm#P01>.

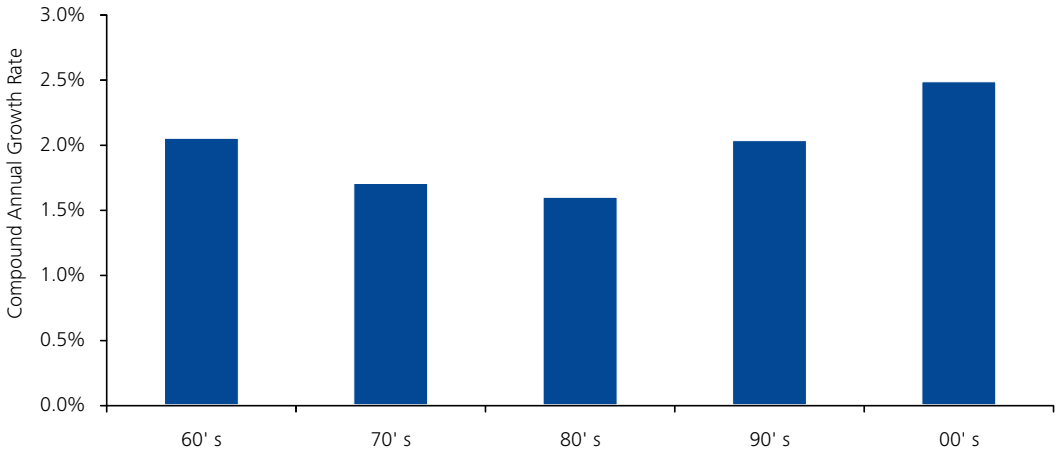
Consistent with an in-depth study of the changes in the pace of productivity over the last several decades[93], our research shows that productivity growth since 1995 has been about 1.5 times the average of the previous two decades. Exhibit 70 describes how productivity growth increased from 1.5 percent per year between 1973 and 1995, to 2.5 percent per year between 1996 and 2008, perhaps reflecting the rise of outsourcing, which reduced the price of inputs.

Exhibit 68: Economy-wide labor productivity (1965-2008)



Source: Bureau of Labor Statistics, Deloitte analysis

Exhibit 69: Labor productivity growth rates by decade (1965-2008)

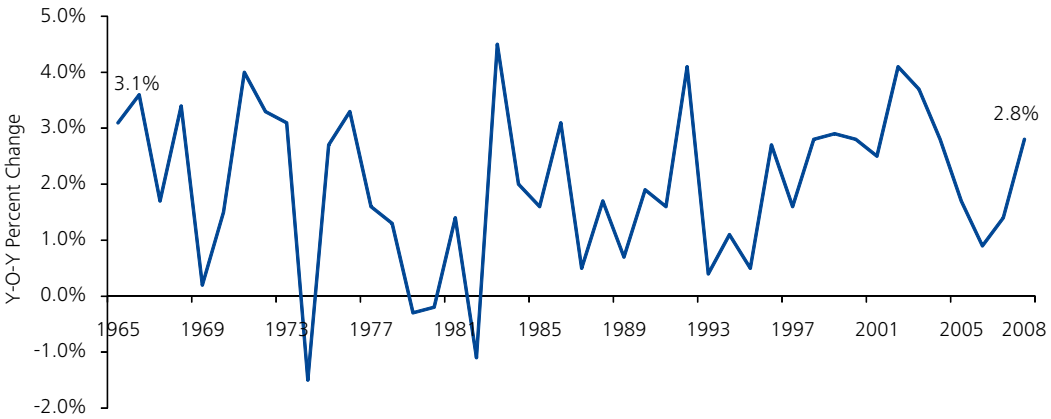


Source: Bureau of Labor Statistics, Deloitte analysis

[92] Note that the 60's column of data includes data from 1965-1970 and the 00's column includes data from 2000-2008.

[93] Dale W. Jorgenson, Mun S. Ho, and Kevin J. Stiroh, "Will the U.S. Productivity Resurgence Continue?," *Current Issues in Economics and Finance* 10, no. 13 (2004): 1-7, http://www.newyorkfed.org/research/current_issues/ci10-13.pdf.

Exhibit 70: U.S. Productivity Growth



Source: Bureau of Labor Statistics, Deloitte analysis

With regard to harnessing the potential of the new digital infrastructure to increase their rate of productivity improvement, companies will need to embrace new institutional architectures, governance structures, and operational practices. They will need to track, for example, employee adoption of new technologies, how well employees are sharing knowledge across organizational boundaries, and the extent to which their companies are part of an ecosystem that is creating new value for customers. The changes in the digital infrastructure are occurring at such a rapid rate that no longer can companies afford to flex their muscle with strategies of scalable efficiency. The real gains will stem from harnessing the potential of scalable learning.

It is not just about being lean; it is also about making smart investments in the future. One of the easiest but most significant ways firms can achieve the performance improvements promised by technology is to invite creative problem solving from the entire workforce—not just the "creative" classes, and not just the workers inside the firm. That way, all workers, wherever they reside—not just a select subset—contribute to solutions. Japanese automakers used elements of this approach with dramatic effects on the bottom line, turning assembly-line employees from manual laborers into creative "problem solvers." Executives need to treat their organizations as a community of engaged members, not a collection of workers mindlessly following the detailed instructions of a process manual.

It becomes a strategic imperative for companies to rethink the way they look at their employees. Corporations are social institutions, which function best when committed human beings (not human "resources") collaborate in relationships based on trust and respect. Destroy this and the whole institution of business collapses.[94] As previously asserted, businesses must abandon the short-term mind-set. Then, they can cut inputs, embracing a long-term perspective centered on producing more value in their outputs. Companies need to find and create platforms that allow employees to access information and connect with others; harnessing the power of these knowledge flows will allow for long-term, increasing productivity gains.

[94] Henry Mintzberg, "Productivity Is Killing American Enterprise," *Harvard Business Review*, July 1, 2007, http://hbr.harvardbusiness.org/2007/07/productivity-is-killing-american-enterprise/ar/2.

Stock Price Volatility

A long-term surge in competitive intensity, amplified by macro-economic forces and public policy initiatives, has led to increasing volatility and greater market uncertainty

Introduction

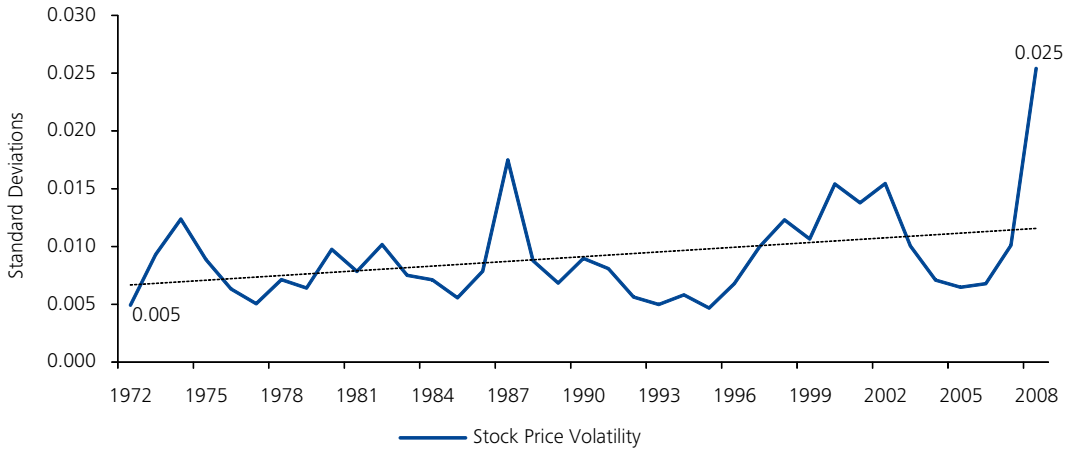
It stands to reason that equity markets are a primary place in which the forces of long-term change would become visible. Paradoxically, perhaps, these long-term forces are playing out in the form of increased short-term volatility in stock prices.

Our analysis of this metric draws on data from the Center for Research in Security Prices (CRSP) at the University Of Chicago Booth School Of Business.[95] By looking at the one-year standard deviation of daily value-weighted[96] total returns across the entire U.S. economy,[97] we tried to establish a proxy for market-related uncertainty as expressed through stock price volatility.[98]

Observations

Over the last 36 years stock price volatility has increased at a six percent CAGR, as shown in Exhibit 71. Not only are annualized stock price daily returns increasingly volatile; the magnitude of the volatility has gone up as well, with increasingly severe upward and downward swings. Since stock prices are heavily driven by investors' reactions to the news of the day as well as assumptions about what is to come, volatility in stock prices can be seen as a reflection of increasingly volatile events and greater uncertainty about the future.

Exhibit 71: Economy-wide Stock Price Volatility (1972-2008)



Source: CRSP US Stock Database ©200903 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business, Deloitte analysis

[95] Established in 1960, CRSP maintains the most complete, accurate, and easily usable securities database available. CRSP has tracked prices, dividends, and rates of return of all stocks listed and traded on the New York Stock Exchange since 1926, and in subsequent years, they have also started to track the NASDAQ and the NYSE Arca, previously known as ArcaEx, an abbreviation of Archipelago Exchange.

[96] "In a value-weighted portfolio or index, securities are weighted by their market capitalization. Each period the holdings of each security are adjusted so that the value invested in a security relative to the value invested in the portfolio is the same proportion as the market capitalization of the security relative to the total portfolio market capitalization." *CRSP Glossary*, s.v. "Value-Weighted Portfolio," http://www.crsp.com/support/glossary.html.

[97] Calculated (or derived) based on data from *CRSP US Stock Database* ©200903 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business.

[98] Stock price volatility is a suitable proxy for uncertainty about where the markets are headed. Stambaugh, Robert and Jeremy Siegel. "Why Stock-Price Volatility Should Never Be a Surprise, Even in the Long Run". Knowledge@Wharton. April 29, 2009 <http://knowledge.wharton.upenn.edu/article.cfm?articleid=2229>.

Volatility in the markets has been a topic among experts for years. Recently, Professor Robert Stambaugh from the Wharton School of the University of Pennsylvania said that while stocks have been traditionally viewed as less volatile over the long-term due to "mean reversion,"[99] in many respects stock prices tend to be more uncertain and more volatile over long horizons.[100]

Stambaugh went on to say that the uncertainty of the long-term trend erodes even short-term "certainties." The prospect of 50 years of uncertainty is much more unsettling than the prospect of one to two years' uncertainty followed by a resumption of stability.

Mean reversion contributing to smoothed volatility is a well-known concept; however, we agree with Professor Stambaugh that the trend around which stock returns coalesce is itself uncertain. In the interview, he noted that even "two centuries of data leaves one with enough uncertainty that as you look at the implied variance of stock returns over the longer horizons, the risk actually does rise significantly with the time horizon."

According to our findings, the long-term trend is toward higher short-term stock price volatility. That is, in any given week or month, stock prices are likely to fluctuate more widely than they would have in a given week or month 20 or 30 years ago. The explanation for this might well be that investors, even if they might not phrase it this way themselves, are concerned about long-term changes occurring as digital technology increasingly penetrates economic life. They are increasingly less certain that U.S. companies (and the national economy) are capable of handling the challenges these long-term changes present. In this way, longer-term uncertainty amplifies short-term doubts, which, in turn, manifest as greater short-term stock price volatility.

Surveying today's business landscape, perhaps investors intuitively grasp that "normal" is a thing of the past—that we have entered a world that does not stabilize as easily as it once might have. Investors may also sense a mismatch between the mind-set and capabilities of today's companies and the environment in which they compete.

As we hope this report makes clear, companies must soon come to terms with the Big Shift through new institutional architectures, governance structures, and operating practices. These new approaches will enable firms to better navigate and even thrive in a less stable environment. Once they do, investor uncertainty may be calmed as investors grow confident that companies (and the economy as a whole) can create economic value in the age of the Big Shift. In this scenario, we would expect, going forward, to see a decrease in the short-term volatility of stock prices.

[99] Volatility does tend to even out over time and stock returns tend to fluctuate around a trend line. Stambaugh, Robert and Jeremy Siegel. "Why Stock-Price Volatility Should Never Be a Surprise, Even in the Long Run". Knowledge@ Wharton. April 29, 2009 <http://knowledge.wharton.upenn.edu/article.cfm?articleid=2229>.

[100] Lubos Pastor and Robert F. Stambaugh, "Are Stocks Really Less Volatile in the Long Run?," http://ssrn.com/abstract=1136847 (last revised May 29, 2009).

Asset Profitability

Cost savings and the value of modest productivity improvement tends to get competed away and captured by customers and talent

Introduction

The rising power of individuals, both in their role as consumers and as employees, has combined with growing competitive intensity, making it more difficult for firms to earn financial returns.

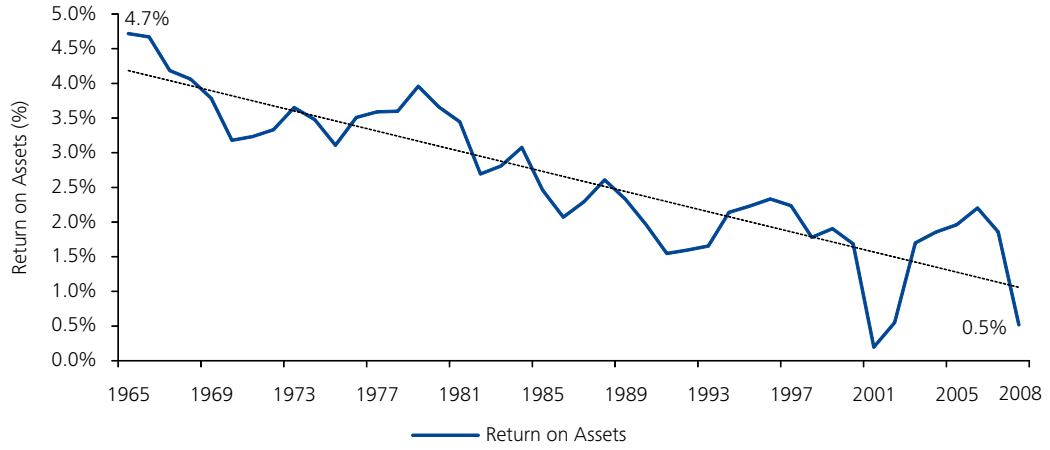
To measure long-term corporate performance, we calculated economy-wide asset profitability (ROA) for all publicly traded firms (more than 20 thousand of them) between 1965 and 2008. We use ROA as a measure of firm performance for two reasons. The first is that ROA is a comprehensive measure of firm profitability without distortions associated with capital structure. By measuring returns relative to assets—rather than net sales—we remove debt-driven profits and obtain a more accurate view of firm performance. Building on this concept, the second reason we use ROA is that it takes into account asset investments, whereas other measures, like return on sales, do not.

A typical downside of asset-based measures is that they are difficult to compare across industries due to inherent differences in capital intensity. While this is certainly true, our primary focus is on measuring performance at an economy-wide level over time, for which this is not an issue.

Observations

The results of this analysis are shown in Exhibit 72, which highlights the erosion of corporate performance over time. Using the secular trend line as a yard-stick for change, we see that the ROA of U.S. firms has declined in 2008 to roughly 25 percent of what it was in 1965. While this deterioration in ROA has been particularly affected by trends in the financial sector, significant declines in ROA have occurred in the rest of the economy as well.

Exhibit 72: Economy-wide Asset Profitability (1965-2008)

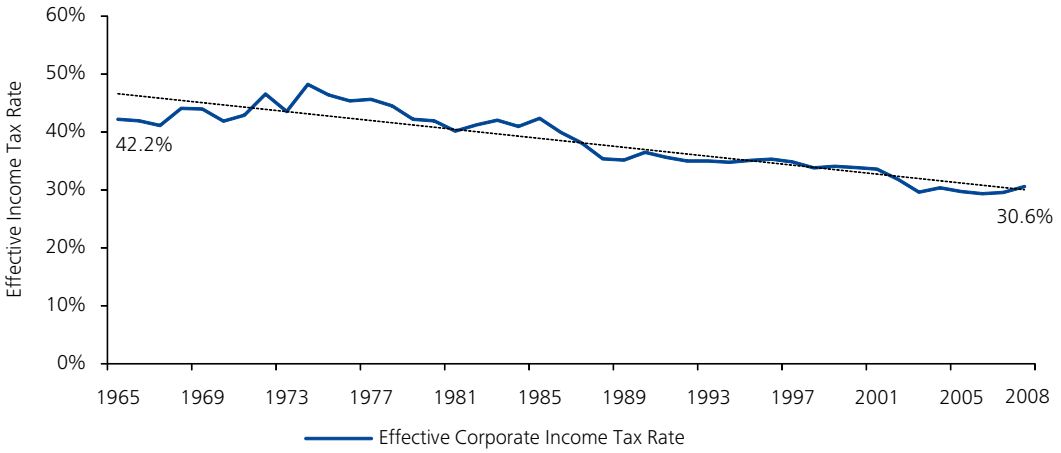


Source: Compustat, Deloitte analysis

[101] Compustat, Deloitte analysis.

This conclusion is compounded by the fact that the effective corporate income tax rate declined significantly during this period. For the companies in our analysis, the 1965 effective corporate income tax rate (including state and federal taxes and taxes paid to foreign governments) was roughly 42.2 percent. As shown in Exhibit 73, by 2006, it had dropped nearly 13 percentage points, to 29.3 percent.[103] While including state income taxes and taxes paid to foreign governments certainly affects this calculation, we reach the same conclusions using corporate federal income tax receipts as a percentage of GDP. In the 1960s, these taxes were equivalent to 3.8 percent of the GDP, but in this decade, only 1.7 percent.

Exhibit 73: Economy-wide effective corporate income tax rate (1965-2008)



Source: Compustat, Deloitte analysis

This downward trend in performance over the 43 year period studied, despite falling tax rates, is occurring across nearly all 15 industries in our study. While some have been hit harder than others, the majority show downward trends in ROA, and the rest are either flat or too volatile to classify. More importantly, none are consistently increasing.

In the last decade, firms have launched a salvo of defensive efforts to bolster ROA centered on efficiency improvements, financial engineering, and mergers and acquisitions. Judging the extent of their success from Exhibit 72 is difficult because of the economic downturns in 2001 and 2008. But since the late 1990s, the trend does appear to flatten a bit, suggesting that the overall rate of decline in ROA is decreasing.

We must remember, however, just how much this last decade's consumer spending has been fueled by phantom dollars as "American households withdrew huge amounts of equity from their homes to support their purchasing power—a practice often short-handed as 'using homes like an ATM.'"[104] In this context, while our performance metric does not "give credit" to firms that use excessive leverage to drive sales, at the same time, it does, just to a different party—consumers, as they have become more leveraged. This begs the question: Is the recent flattening, in fact, a mirage?

[102] Compustat, Deloitte analysis.

[103] Ibid.

Either way, defensive measures have barely put a dent in the secular forces eroding returns. As we can see, measures such as outsourcing, off-shoring, and cost reduction can only be squeezed so far; otherwise, Exhibit 72 would show a markedly upward trend in recent years.

Truly reversing this will require a profound shift in thinking and a strong grasp of the forces—often overlooked—facing modern firms. In particular, executives will have to focus on capability leverage and mobilizing the resources of others to deliver more value (the numerator in the profitability ratio) rather than just focusing on cost reduction as a driver of firm profitability.

[104] L. Josh Bivens, "As Consumption Goes, So Goes the American Economy," Economic Policy Institute, http://www.epi.org/economic_snapshots/entry/webfeatures_snapshots_20080319 (created on May 29, 2009).

ROA Performance Gap

Winning companies are barely holding on, while losers are rapidly deteriorating

Introduction

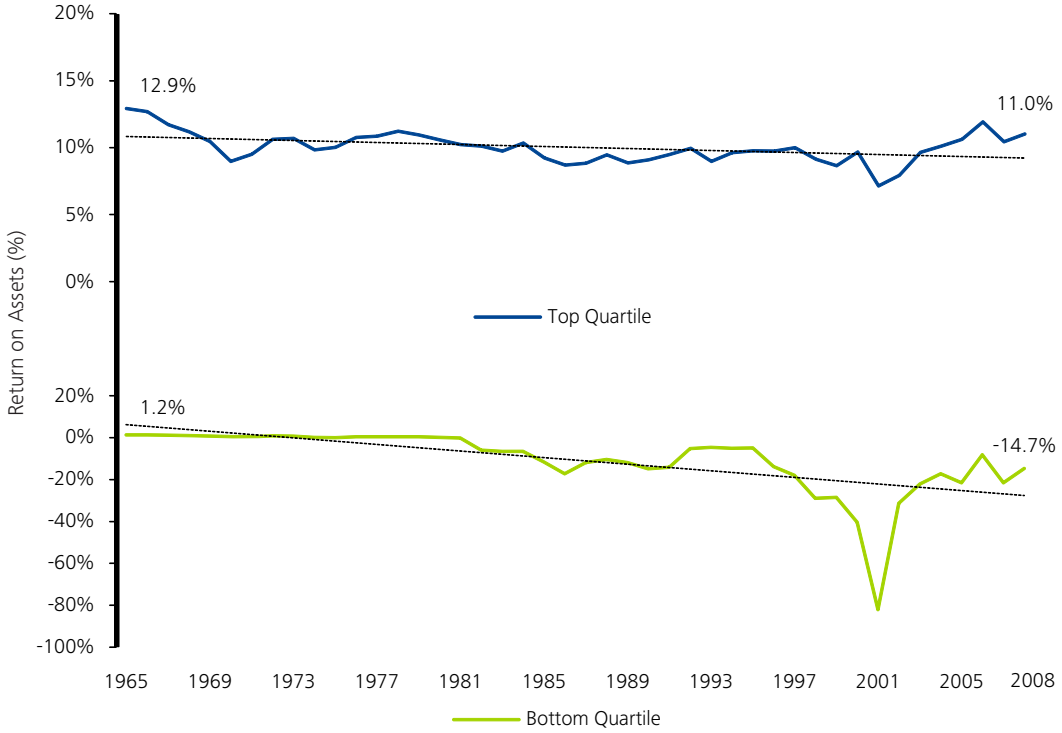
Metrics in the Shift Index show how economy-wide ROA is declining as competition intensifies and consumers and talented workers gain market power. Yet we all know averages can be deceiving. Are some companies generating more and more returns, while losers are losing big and dragging down ROA? What is happening at the company level? The ROA Performance Gap, discussed in this section, is meant to shed more light on what might otherwise be obscured by averages.

We define the ROA Performance Gap as the percentage difference in ROA between high and low performing firms (the top and bottom quartiles in terms of ROA performance). By studying trends in this metric over time, we can observe how value is distributed amongst firms and assess the true consequences of doing poorly or well in the Big Shift.

Observations

The ROA Performance Gap shows a bifurcation of winners and losers; this finding is by no means new. What is surprising, however, is how very little winners have gained during the past 40 years. Technology has enabled firms to leverage their talent in new and innovative ways and cut costs from operations on an unprecedented scale. Yet as Exhibit 74 shows, even the best performers have failed to convert these gains into ROA gains.[105]

Exhibit 74: Economy-wide Asset Profitability by quartile (1965-2008)



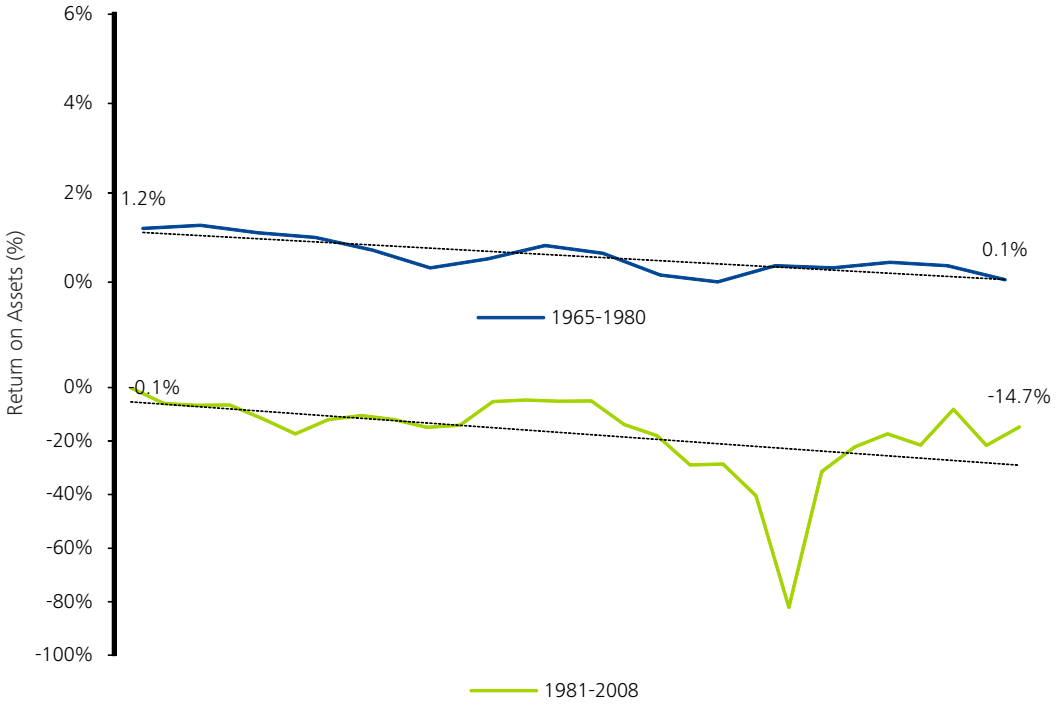
Source: Compustat, Deloitte analysis

[105] Compustat, Deloitte analysis.

While top firms have maintained or lost some ground, underperformers are deteriorating at an increasingly rapid pace. In the first 15 years of the analysis, for example, companies in the bottom quartile returned an average of .5 percent on their assets; in the 27 years following, they averaged nearly negative 20 percent.

Exhibit 75, which compares laggards' ROA in these two periods, highlights a precipitous drop in returns and a dramatic increase in volatility.[106]

Exhibit 75: Economy-wide Asset Profitability of bottom quartile (1965-1980, 1981-2008)



Source: Compustat, Deloitte analysis

The ROA Performance Gap—and its underlying drivers—has far-reaching and powerful implications for today's executive. A recent article in the *Harvard Business Review*, titled "Investing in IT That Makes a Competitive Difference," aptly describes the threat: "Just as a digital photo or a web-search algorithm can be endlessly replicated quickly and accurately by copying the underlying bits, a company's unique business processes can now be propagated with much higher fidelity across the organization by embedding them in enterprise information technology. As a result, an innovator with a better way of doing things can scale up with unprecedented speed to dominate an industry. In response, a rival can roll out further process innovations throughout its product lines and geographic markets to recapture market share. Winners can win big and fast, but not necessarily for very long."[107]

To survive in this new and constantly changing environment, leaders must move beyond marginal expense cuts with diminishing returns and make smart investments in the future that enable talent at every level to contribute knowledge and drive increasing returns. The key success factor in the world of the Big Shift will be the ability to learn faster as an organization to drive cumulative improvements in performance by working with others.

[106] Compustat, Deloitte analysis.

[107] Andrew McAfee and Erik Brynjolfsson, "Investing in IT That Makes a Competitive Difference," Harvard Business Review, July-August 2008: 98-107.

Firm Topple Rate

The rate at which big companies lose their leadership positions is increasing

Introduction

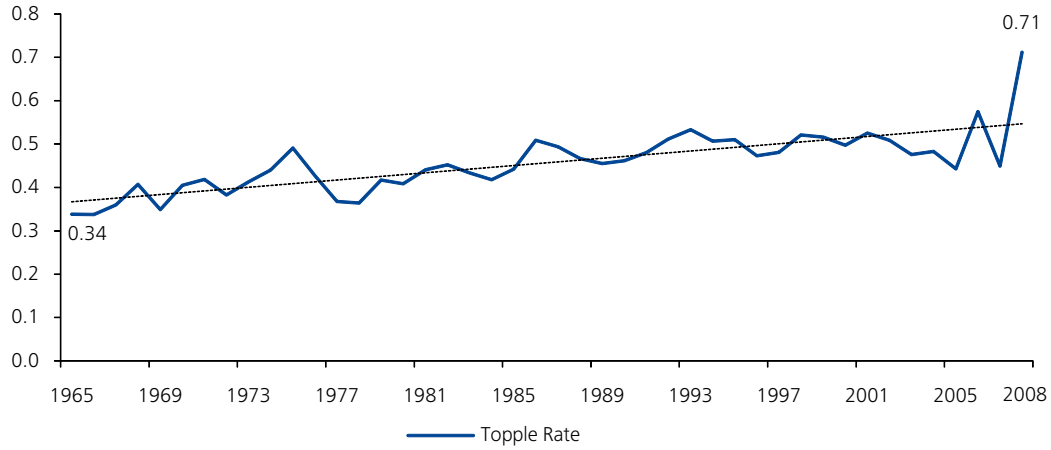
This Shift Index uses asset profitability and the gap between winners and losers to describe a climate in which returns are deteriorating. Neither of these metrics, however, quantifies the ability of individual firms to stay on top of the curve, even if the curve itself is declining. We know winners are worse off—but are they at least winning longer? Or is it increasingly difficult to develop a sustained advantage in the world of the Big Shift? The Topple Rate metric addresses these questions.

Observations

The Topple Rate metric tracks the rate at which big companies (with more than $100M in net sales) change ranks, defined in terms of their ROA performance. Of course, in any large, dynamic market (such as the U.S. economy), one would expect ranks to change often. We adjust for this by subtracting out toppling that would have occurred had firms taken statistical "random walks," where they shuffled ranks randomly. In so doing, we remove volatility from the data that is not indicative of the underlying concept we are trying to study. We then arrive at a strong and accurate marker of the dynamism and upheaval in the economy.

As shown in Exhibit 76, both of these are clearly on the rise.[108] Between 1965 and 2008, the rate at which firms suffer a decline in their ROA ranking, relative to other firms, increased more than 40 percent, as competition exposed low performers and ate away at their returns.

Exhibit 76: Economy-wide Firm Topple Rate (1965-2008)



Source: Thomas C. Powell and Ingo Reinhardt, "Rank Friction: An Ordinal Approach to Persistent Profitability," Compustat, Deloitte analysis

Legend
0: Ranks Perfectly Stable = Perfectly Sustainable Competitive Advantage
1: Ranks Change Randomly = Complete Absence of Sustained Competitive Advantage

[108] Thomas C. Powell and Ingo Reinhardt, "Rank Friction: An Ordinal Approach to Persistent Profitability," Compustat, Deloitte analysis.

In the context of our other analyses, we see that these forces, aided by powerful consumers and talent, have not only driven down returns but fundamentally changed the dynamics of who gets them. The group of winners is churning at an increasing and rapid rate.

The result of rising competitive intensity becomes palpable in the rapid rate at which companies suffer declines in their ROA ranking. Nearly every advantage, once gained, is shown to be temporary. The notion of "sustainable" competitive advantage is increasingly illusive as the pace of change in the business world speeds up.

As we discussed in the Overview section of this report, rapid change requires new flexibility from corporate institutions and the ability to increase not just efficiency but also the rate at which they learn, innovate, and perform.

Shareholder Value Gap

Market "losers" are destroying more value than ever before—a trend playing out over decades

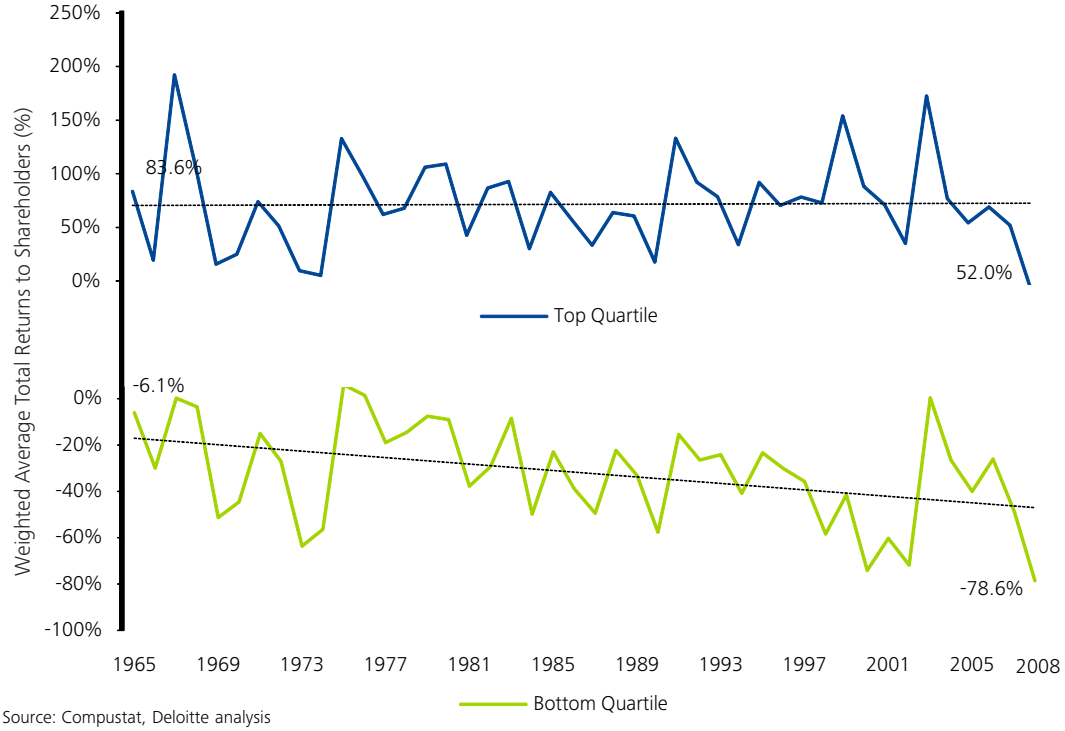
Introduction

The trends discussed so far have had a profound impact on financial markets. Stock prices, which are based on expectations of future returns, have a much longer view than the balance sheet, but often do a poor job of representing firm performance. At the same time, boards' strong focus on stock prices means they are uniquely positioned to quantify the value of acting on Big Shift trends or the risks of ignoring them. Thus, we must understand the behavior, however erratic, of stock prices and how the market treats "winners" and "losers."

Observations

In this case, we define these two groups by their total returns to shareholders (TRS), a common metric that incorporates share price appreciation and dividends. By looking at trends in the total returns of each group over time, we can gauge how investors reward companies that beat expectations and punish those that do not. More importantly, we can measure how well these expectations truly reflect the realities of corporate performance.

Exhibit 77: Weighted average Total Returns to Shareholders by quartile (1965-2008)



Source: Compustat, Deloitte analysis

Exhibit 77 highlights the trends in TRS over time.[109] Over the long term, we see that the upper quartile of firms—the "winners"—have not managed to increase the rate at which they create value for their shareholders. This is consistent with our findings that the economic performance (measured by ROA) of these companies has been relatively flat. At the same time, however, we observe that laggards are rapidly losing ground. Since 1965, these firms have mimicked their ROA performance by destroying increasing amounts of shareholder value. Today, the costs of underperforming in the market are more than double what they were 40 years ago.

In a market captivated by short-term movements, the long-term polarization of returns has powerful implications for executives. Once again, it suggests that current business strategies are less and less effective and that investors are recognizing this in their diminished expectations regarding companies' long-term performance. Given the ROA trends reviewed earlier, this is not surprising and suggests that the answer is much more likely to involve fundamental shifts in strategies and operational performance rather than simply trying to tell a more compelling "story" to the investment community.

A tangential—but highly relevant—implication of these trends is that it will only become more and more difficult to meet investor expectations as competition puts pressure on economic, and thus shareholder, returns. Executives must be increasingly wary of this dynamic; as we show in a later section, turnover in their ranks is increasing.

[109] Compustat, Deloitte analysis.

Consumer Power

Consumers possess much more power, based on the availability of much more information and choice

Introduction

Relations between vendors and consumers are changing profoundly as product choices proliferate and consumers gain more access to information about these choices. Vendors once had the upper hand, but now consumers are gaining power relative to the vendors they encounter.

Consumer power results from many factors. Of these, the increased availability and access to information is the number one driver.[110] Information gives consumers increasingly convenient access to alternatives. Supported by the Internet, search engines, comparison sites, and online reviews, they are able to find the best products at the lowest price. Switching costs, meanwhile, are very low, often requiring only the click of a mouse. The Internet makes remote transactions possible, and, as a result, consumers can buy products and many services from nearly anywhere at any time.

Consumer power is a function of not only convenient access to alternatives but also the proliferation of choices and rising communication among consumers about these choices. Often referred to as "crowd clout," this notion is defined as "an online grouping of citizens/consumers for a specific cause, be it political, civic or commercial, aimed at everything from bringing down politicians to forcing suppliers to fork over discounts."[111] The final element of consumer power is consumers' ability to avoid marketing messages from companies. Technology has armed consumers with more control over what they see.

To capture these various aspects of consumer power, the Index compiles survey responses to a set of six questions testing various indicators of consumer power as described in the preceding paragraphs. These questions ask the degree to which consumers perceive to have more choices than in the past, convenient access to and information about those choices, access to customized offerings, the ability to avoid marketing efforts, and little or no penalty for switching away from a brand. Nearly 4,300 responses across 26 consumer categories were tested in this study.[112]

Observations

In our inaugural study, the overall consumer power score for 2008 was 67, which indicates relatively high consumer power across all categories. The true value of this study, however, is in analyzing individual categories and trending their scores over time.

Exhibit 78: Consumer Power (2008)

		Strongly Disagree					Strongly Agree		
		1	2	3	4	5	6	7	Top 2
1	I have convenient access to choices in this category	3%	2%	4%	19%	19%	23%	30%	53%
2	There are a lot more choices now in this category than there used to be	3%	3%	6%	19%	18%	22%	29%	51%
3	It is easy for me to avoid marketing efforts	3%	2%	5%	26%	18%	21%	23%	44%
4	There is a lot of information about brands in this category	2%	3%	5%	23%	23%	22%	22%	44%
5	There isn't much cost associated with switching away from this brand	7%	6%	9%	27%	17%	16%	19%	35%
6	I have access to customized offerings in this category	10%	6%	9%	28%	16%	15%	17%	32%

[110] For more details about the relationship between access to information and consumer power, see Glen Urban, *Don't Just Relate - Advocate!: A Blueprint for Profit in the Era of Customer Power* (Philadelphia: Wharton School Publishing, 2005), http://searchcrm.techtarget.com/generic/0,295582,sid11_gci1197519,00.html.

[111] "Crowd Clout," Trendwatching, http://trendwatching.com/trends/crowdclout.htm (created April 2007).

[112] For further information regarding survey scope and description, please refer to the Shift Index Methodology section.

Looking across all consumer categories, over 50 percent of respondents strongly agreed that they had more choices than before and also now had convenient access to those choices (as shown by Exhibits 78 and 79). Switching costs and customized offerings were the lowest contributors to overall consumer power. All of these responses are indicative of the current environment and we can only expect these percentages to increase over time.

Exhibit 79: Consumer Power by category (2008)

Consumer Category	Consumer Power
Search engine	70.9
Snack Chip	70.7
Broadcast TV News	70.2
Banking	70.1
Restaurant	69.7
Soft Drink	69.5
Home entertainment	69.1
Pain Reliever	69.0
Hotel	68.8
Magazine	68.8
Insurance (Home/Auto)	68.4
Computer	68.0
Automobile Manufacturer	67.3
Athletic Shoe	66.8
Department Store	66.3
Mass Retailer	65.9
Household Cleaner	65.9
Investment	65.8
Wireless Carrier	65.6
Grocery Store	65.5
Airline	65.4
Cable/Satellite TV	63.1
Gaming System	62.5
Gas Station	61.6
Shipping	61.3
Newspaper	54.0

Source: Synovate, Deloitte analysis

As much insight as the overall numbers provide, analyzing the absolute and relative responses to each consumer category provides deeper insights into the changes in competitive pressures and consumer preferences. The survey findings show high consumer power in most categories, with the exception of Newspapers, a category in which consumers options are limited. While there are many options for news media available in the new digital era, those who still prefer paper versions are usually limited to two or three local options and just as few national options.

Each consumer category with high consumer power scores are driven by different underlying elements. The existence of many more choices drives Snack Chips, Soft Drinks, and Home entertainment; while low switching costs drive Search Engine and Broadcast TV News. These high consumer power scores indicate greater competitive intensity in these categories than others. Some categories (Snack Chips and Soft Drinks) currently have strong brand loyalty, which may protect them in the interim, but still leave them very vulnerable to competitive threats. Similarly, categories at the low end were also driven by specific elements for power. Cable/Satellite TV and Newspapers were driven mainly by the lack of accessible options from a consumer standpoint, while Gas Stations and Shipping were driven by less information availability than others. The current low consumer power does not provide much solace for providers of these services. While low in comparison, consumers still have high absolute power in all these categories. In addition, each of these consumer categories face threats from forces other than competition: changes in public policy blurring telecommunication and media providers; traditional print media versus ubiquitous digital news media; environmental concerns driving toward lowered fossil fuel usage; and increased usage of digital media (downloadable books, music, and movies) lowering shipments of physical products.

Trends toward increasing consumer power have significant implications for company executives. In particular, consumer power provides a foundation, and an outlet, for brand disloyalty, especially if vendors are slow to respond to evolving customer needs and power.

De-emphasizing traditional marketing efforts will undoubtedly help companies capture the attention of consumers, but that may not be enough. In the marketing world, consumers' demands are creating a shift in the way companies engage with them, one in which companies will no longer tactically succeed by trying to isolate consumers and limit their choices. They will need to look instead for ways to help consumers make the most of their new-found power, for instance, by helping them connect to the information they need and other vendors that might help them. This suggests that companies will rethink their role as content providers. By giving customers complete and honest information, as well transparent access to alternative solutions that may better serve their needs, companies can build trust with their customers that will provide companies with long-term returns and increased loyalty.

Brand Disloyalty

Consumers are becoming less loyal to brands

Introduction

Consumers today are inundated with more brands than ever before. The number of brands in U.S. grocery stores has increased three-fold since 1991,[113] and U.S. citizens see an average of 3000 advertising messages a day.[114] Furthermore, consumers now have access to information from more trusted sources to evaluate brands. Their choice of purchase is no longer limited to believing or disbelieving the claims of an advertisement. For all these reasons, consumer loyalty to brands is on the decline.

While established authorities, such as J.D. Power and *Consumer Reports*, still sway people's opinion, a plethora of consumer-driven Web sites are gaining power, too. This increased availability of information has also changed the landscape of trust. The *2009 Edelman's Trust Barometer Report* notes, "Nearly two in three informed publics—62 percent of 25-to-64-year-olds surveyed in 20 countries—say they trust corporations less now than they did a year ago."[115] The sheer volume of information and the ease of comparison have created a generation of informed consumers that are less reliant on the power of a brand to make their purchase decisions.

The disloyalty metric is based on survey responses to a set of six questions testing various aspects, indicators, and behaviors of brand disloyalty and brand "agnosticism." These questions ask the degree to which consumers would consider switching to other brands, compare prices, consult friends, seek information on other brands, switch to brands with the lowest price, and pay attention to advertising from other brands. Nearly 4,300 responses across 26 consumer categories were tested in this study.[116]

Observations

In our inaugural study of brand disloyalty, the 2008 score was 57, which indicates relatively high disloyalty for most brands across all categories (as shown by Exhibit 80). As with consumer power, the true value of this study is in analyzing individual categories and trending their scores over time.

Exhibit 80: Brand Disloyalty by category (2008)

Consumer Category	Disloyalty
Hotel	70.1
Airline	69.9
Home entertainment	69.0
Mass Retailer	68.0
Department Store	65.9
Grocery Store	63.6
Automobile Manufacturer	62.7
Computer	61.7
Cable/Satellite TV	61.4
Shipping	60.0
Gas Station	59.5
Restaurant	58.5
Insurance (Home/Auto)	57.8
Athletic Shoe	57.2
Wireless Carrier	56.5
Gaming System	55.3
Banking	54.6
Household Cleaner	54.5
Search engine	53.4
Investment	53.3
Snack Chip	51.5
Pain Reliever	51.4
Broadcast TV News	49.4
Magazine	45.2
Newspaper	42.3
Soft Drink	40.9

Source: Synovate, Deloitte analysis

[113] James Surowiecki, "The Decline of Brands," Wired 12, no. 11 (2004), http://www.wired.com/wired/archive/12.11/brands.html.

[114] Lonny Kocina, "The Average American Is Exposed to…," Pay Per Interview Publicity, http://www.publicity.com/editorials/article.cfm?id=4&m=copy.

[115] 2009 *Edelman Trust Barometer*, Edelman, http://www.edelman.com/trust/2009/docs/Trust_Barometer_Executive_Summary_FINAL.pdf (created January 29, 2009).

[116] For further information regarding survey scope and description, please refer to the Shift Index Methodology section.

Exhibit 81: Brand disloyalty by age group (2008)

Age Group	Disloyalty
15 - 20	62.2
21 - 25	59.8
26 - 30	59.4
31 - 35	60.9
36 - 40	60.8
41 - 45	57.9
46 - 50	57.9
51 - 55	55.8
56 - 60	54.2
61 - 65	54.2
66 - 70	51.0
71 - 75	49.0
75 - 80	47.9

Source: Synovate, Deloitte analysis

Among the survey results was the inverse relationship between age and brand disloyalty: As one might expect, the younger generations are a lot less loyal to brands than the older generations (Exhibit 81). This is in alignment with the younger generations' being more Internet savvy and therefore more aware. Younger consumers are also less likely to have gone through decades of relying on brand power to denote the reliability of a product. In the past, where information was scarce, consumers had to rely on tried and tested brands or consumer product assessment agencies to determine products' value. Decades of such reliance is not easily surrendered. In contrast, the younger generations are much more willing to explore new options and have a healthy distrust for "authoritative voices."

Across the consumer brands tested by this survey, Hotels, Airlines, and Home Entertainment had the highest disloyalty scores while Soft Drinks, Newspapers, and Magazines had the lowest. This may be correlated to the relative cost of items and a reflection of the current economic times. Consumers seem to be less loyal to brands in higher cost occasional product categories than with low-cost everyday purchases. This hypothesis is also supported in that those same customer categories have the most respondents agreeing and disagreeing respectively to the statement (I would) "compare prices of this brand to other brands."

Gas Stations, Mass Retailers, and Department Stores are likely the most affected by the current economic sentiment with 47 percent, 45 percent, and 41 percent, respectively, of the respondents in each category strongly agreeing that they are "more likely to consider other brands than a year ago." Soft Drinks, Newspapers, Magazines, and Broadcast News are the least likely to be affected by this same measure with 44 percent, 41 percent, 39 percent, and 39 percent, respectively, of respondents in each category strongly disagreeing with the above statement.

Exhibit 82: Consumer Power and Brand Disloyalty (2008)

Consumer Category	Consumer Power	Brand Disloyalty
Home entertainment	69.1	69.0
Hotel	68.8	70.1
Soft Drink	69.5	40.9
Magazine	68.8	45.2
Mass Retailer	65.9	68.0
Airline	65.4	69.9
Newspaper	54.0	42.3

High Low

Source: Synovate, Deloitte analysis

Comparison of Brand Disloyalty and Consumer Power[117] scores for some categories allow for some additional insights (Exhibit 82). In general, one would expect consumers to be more disloyal as they gain power within a category. But this does not always prove to be the case.

The Home Entertainment and Hotel categories are high in both Consumer Power and Brand Disloyalty. These are driven by all of the elements comprising each metric, but primarily by the accessibility of pricing and information in these categories.

[117] For further information, please refer to the Consumer Power metric.

Consumers have high power over the Soft Drink and Magazine categories, yet show low disloyalty to them. This low disloyalty is partly due to consumers also having the highest brand preferance in these categories.[118] Therefore, while a great many more choices are available today in both these categories, consumers continue to have a strong preference for brands in these categories and feel no compulsion to switch. It is to be seen whether consumer's loyalty will withstand the increasing proliferation of choices, especially as more personalized choices become available in the future.

Mass Retailers and Airlines face relatively low consumer power and high disloyalty, as there are relatively fewer choices and customized offerings in these categories. Nonetheless, consumers are disloyal to Mass Retailers and Airlines, as is reflected by the high amount of price comparisons they make in those categories, indicating that these categories may be further disrupted as more choices appear.

Newspapers fall in an odd category where consumers neither possess high power nor practice disloyalty. Given the small number of choices for newspapers in any geographical location, matched with comparatively low prices and limited price disparities, consumers do not have much impetus or need to switch brands within that category. What is not revealed in this study is the secular movement away from print material driven by digital media, since all the questions are targeted toward competition and brand dilution within a category—low disloyalty affords little protection for a category that is shrinking as a whole.

Trends toward increasing brand disloyalty have significant implications for company executives. For established brands, they signal an increasingly competitive environment. For new brands, they indicate an opportunity to capture market share faster with fewer marketing dollars.

One implication for marketers may be that, as brand loyalty dissipates, the core brand promise should focus less on product or service features and more on establishing trust that a product or service provider can configure products and services to meet individual needs. Companies should also integrate consumers more fully in the product life cycle from R&D, through product marketing—from determining which products and services are most valued to building grassroots trusted validation of products and services utilizing the power of the new digital infrastructure to build scalable trust-based relationships.

[118] 74 percent and 65 percent of the respondents strongly agreed (top two response categories) to the question 'I have a strong preference for the brand I use' for the soft drink and magazine categories, respectively.

Returns to Talent

As contributions from the creative classes become more valuable, talented workers are garnering higher compensation and market power

Introduction

As U.S. companies use fewer tangible assets to generate revenues and profits, the so-called creative classes of workers play an increasing role in firms' profitability.[119] These workers now garner disproportionate returns, relative to other workforce classes, and wield growing power relative to the firms that employ them.

We used data from the Bureau of Labor Statistics[120] to track long-term trends in fully loaded compensation across a wide range of occupational groupings.[121] In so doing, we also relied on analysis conducted by Richard Florida's Creative Class Group,[122] which categorizes the Bureau's occupational classifications into the following categories[123]:

Creative Class

- **Super-Creative Core**: Computer science and mathematics; architecture and engineering; life, physical, and social sciences; education, training, and library management; and arts, design, entertainment, sports and media studies.
- **Creative**: Management; business and financial operations; law; healthcare and technical fields; high-end sales and sales management.

Other Workforce Class

- **Working**: Construction and extraction; installation, maintenance, and repair; production; and transportation and material moving.
- **Service**: Health care support; food services; building and ground cleaning and maintenance; personal care and service; low-end sales and related areas; office and administrative support; and community and social services.
- **Agriculture**: Farming, fishing, and forestry.

Annual mean total compensation within these classes is a proxy for the Returns to Talent metric. As companies develop tighter focus, they become better able to participate in (and eventually orchestrate) new distributed, inter-firm organizational forms—exemplified by open source initiatives—that are now mobilizing tens and even hundreds of thousands of participants in highly flexible, diversely specialized, and customizable configurations. Because they can react quickly to fast-moving, unpredictable circumstances, these "networks of creation" are supremely well suited for the Big Shift era.[124] Along with the geographic concentrations of talent we call "spikes" (described in the Migration of People to Creative Cities metric), creation nets are the places where creative class workers connect to amplify and accelerate learning and performance.

Observations

For the last five years, the U.S. national labor market, as well as each industry, has reflected an increasingly greater value gap between the creative class and the rest of the workforce. Occupational groupings with high value growth, such as Management and Professional as well as Business and Financial, have contributed significantly to the creative class value gap increase.

[119] In 2008, asset intensity in the United States was 60 percent of its 1965 level.

[120] These, in turn, leverage Occupational Employment Statistics (OES) department and Employer Cost for Employee Compensation (ECEC) information.

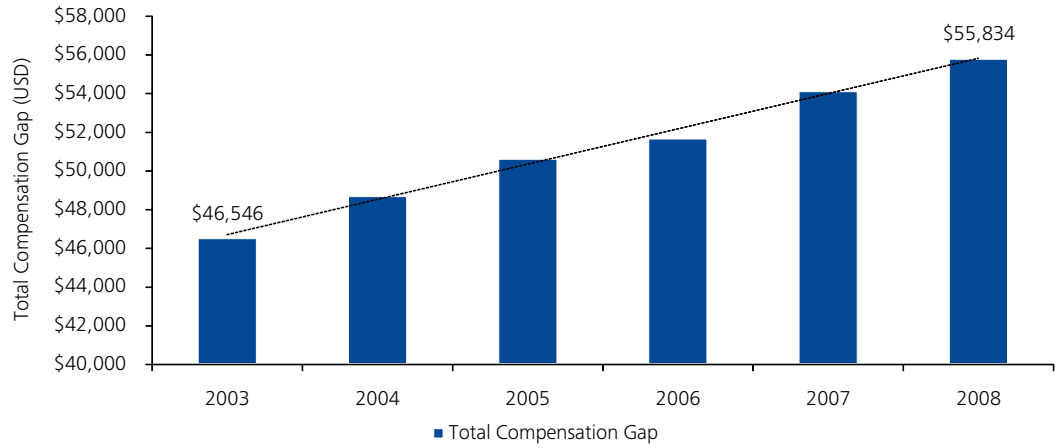
[121] Including health insurance, other employee benefits, and bonuses.

[122] Florida, *The Rise of the Creative Class*.

[123] "The 2000 Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data." "Standard Occupational Classification," Bureau of Labor Statistics, http://www.bls.gov/SOC (accessed June 9, 2009).

[124] Hagel and Brown, "Creation Nets."

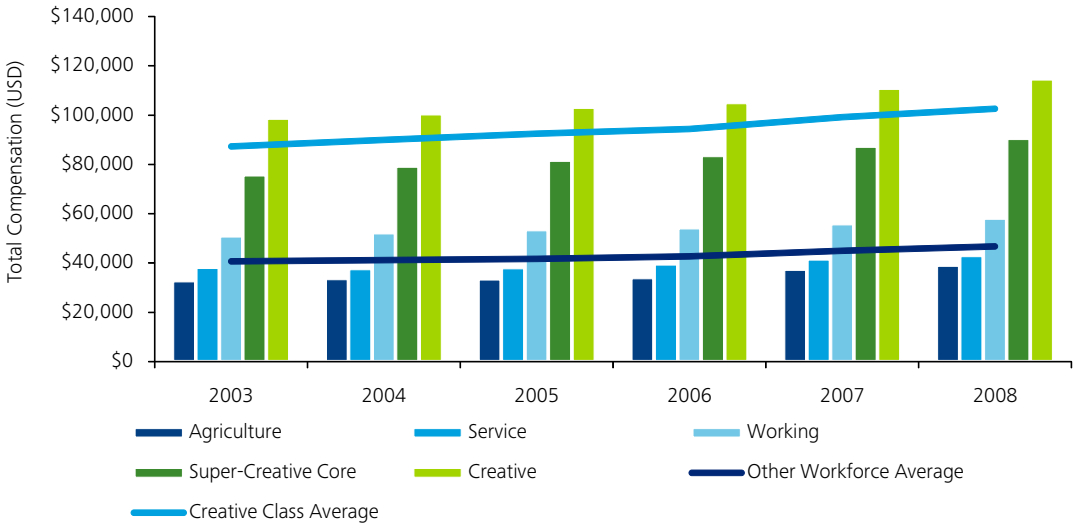
Exhibit 83: Creative Class compensation gap (2003-2008)



Source: Bureau of Labor Statistics, Richard Florida's "The Rise of the Creative Class", Deloitte analysis

Exhibit 83 shows the pronounced total compensation gap over the last five years. Creative class occupations, on average, have been valued approximately $51,271 or 119 percent more than other workforce occupations, with the gap between the creative class and the rest of the workforce increasing at a four percent annual growth rate during the past six years. Looking closer at each class and its drivers in Exhibit 84, we see "creative" occupations garnering the most within the creative class and "working" occupations receiving the highest total compensation within the rest of the workforce (please note, agriculture in the OES data does not include farms).

Exhibit 84: Total compensation breakdown (2003-2008)



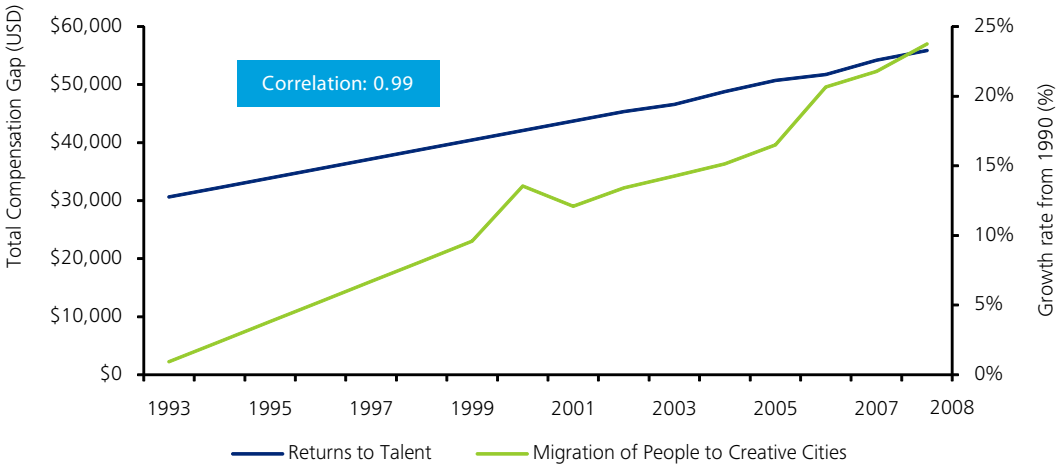
Source: Bureau of Labor Statistics, Richard Florida's "The Rise of the Creative Class", Deloitte analysis

Conducting our basic correlation analysis, we also see interesting sets of relationships when comparing the growth of the Returns to Talent gap with other indicators.[125]

We found that GDP growth and the Returns to Talent metric have a very strong positive correlation, signaling that creative market participants benefit from and, in turn, may contribute strongly to economic growth.[126] Furthermore, among the manufacturing, service, and creative sectors of the economy, the latter accounts for nearly half of all wage and salary income, $1.7 trillion dollars, as much as the manufacturing and service economy combined.[127]

We also found that Returns to Talent and Migration of People to Creative Cities[128] have a very strong positive correlation,[129] (Exhibit 85) helping to confirm that as market participants gravitate to creative cities, talent is compensated more.

Exhibit 85: Correlation between Returns to Talent and Migration of People to Creative Cities (1993-2008)



Source: US Census Bureau, Richard Florida's "The Rise of the Creative Class", Deloitte analysis

The literal rise of the creative class is both a reflection of a broader change in the economy and a driver of that change. According to Florida's research, the number of people working in the creative class and the super-creative core has increased by a factor of 12 and 20, respectively, since 1900 (Exhibit 86), significantly outpacing growth in the other workforce classes. The fact that the creative class is growing faster and deriving greater returns reflects broad changes in the composition of the U.S. economy, which has evolved from being primarily agricultural to manufacturing, service, and finally knowledge based.

[125] For further information, please refer to the Shift Index Methodology section.

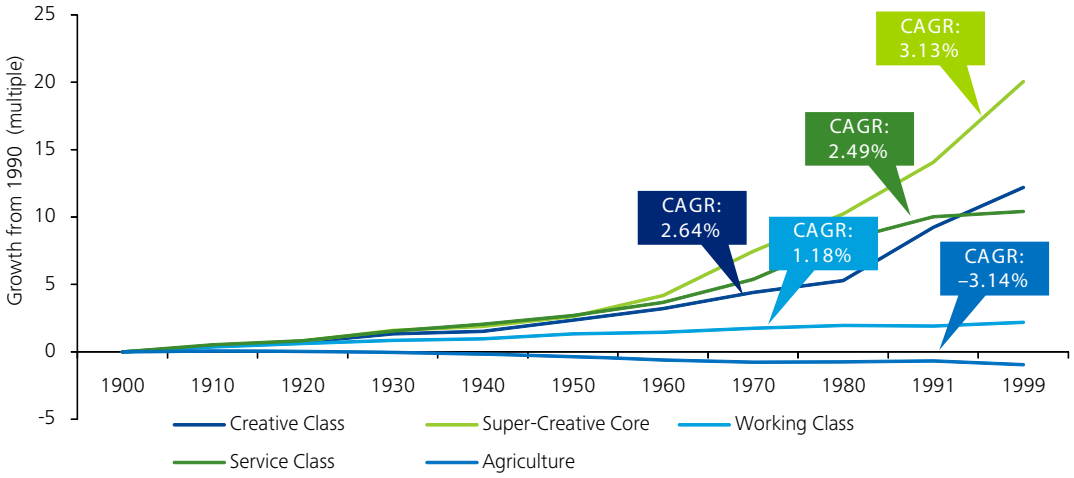
[126] Ibid.

[127] Florida, Rise of the Creative Class.

[128] For further information, please refer to the Migration of People to Creative Cities metric.

[129] For further information, please refer to the Shift Index Methodology section.

Exhibit 86: Creative Class growth (1990-1999)



Source: US Census Bureau, Richard Florida's "The Rise of the Creative Class", Deloitte analysis

The results are clear: The creative class is capturing an increasingly larger share of the economic pie.

Returns to Talent also quantitatively correlates[130] with other Flow Index metrics, such as Wireless Activity and Internet Activity, as well as Foundation Index metrics such as Internet Users and Wireless Subscriptions.

In order to improve the value they get for the increasingly higher cost of talented employees, executives will need to rethink many of their firm's primary activities. Firms today are often an ill-fitting bundle of three very different types of businesses: infrastructure management, product innovation and commercialization, and customer relationship businesses. The different economics, skill sets, and cultures required to succeed in each makes it difficult, when they remain bundled together, to provide creative class workers the circumstances they need to best develop their talent.

These massive networks function less through conventional command-and-control, make-to-stock, and "push"-minded approaches than through the laws of attraction and influence that characterize "pull" systems. Because they enable workers and firms to mobilize resources on an as-needed basis, pull systems encourage rather than stifle the tinkering and experimentation that are a primary means of learning and talent development.

Firms will also need to harness the forces that have enabled Silicon Valley and other economic "spikes" to attract talent from around the world. Interestingly, roughly half of the entrepreneurial talent fueling the success of Silicon Valley came from outside the United States. Public policy should reflect the importance of immigrant talent if the United States as a whole is to emulate the Silicon Valley model. Even more promisingly, a focus on talent development can transcend national interests. After all, if we are serious about developing the talent of our own people, we must find rich and creative ways to access and connect with talent wherever it resides around the world. No matter how talented U.S. citizens are, they will develop their talent even more rapidly if they have the opportunity to interact with other equally talented people outside this country.

[130] For further information, please refer to the Shift Index Methodology section.

Executive Turnover

As performance pressures rise, executive turnover is increasing

Introduction

Given the high competitive pressures and declining ROA that have characterized the performance of the U.S. economy since 1965, is it any surprise that executives lose their jobs more frequently?

In many ways, executives epitomize the new difficulties facing all roles in the workforce as labor markets globalize, making Executive Turnover an important metric in the People driver of the Shift Index.

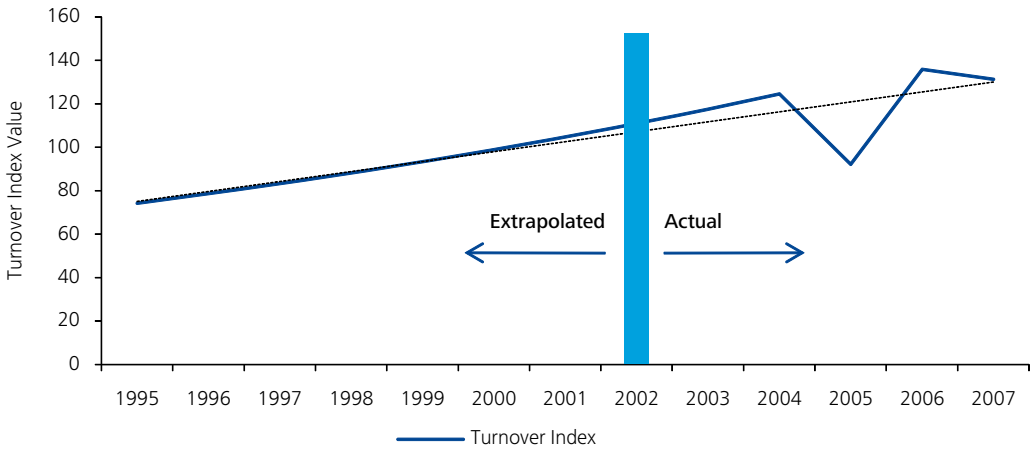
Certainly, few would dispute that a faster-moving, less predictable world has raised the degree of difficulty for senior management jobs, even while remunerating them more highly. Executive Turnover thus provides a proxy for the performance pressures all workers experience.

Our analysis draws on the Management Change Database, developed by Liberum Research. This database measures executive changes (from the level of vice president to board director) in public companies from 2005 to 2008.

Observations

From 2005 to 2008, the rate at which executives resigned from, retired, or were fired from their jobs increased at a 19 percent CAGR, as shown by Exhibit 87. A separate study found that from 1995 to 2006, annual CEO turnover grew 59 percent, with the subset of performance-related turnover increasing by 318 percent.[131] Globally, only half of outgoing CEOs left office voluntarily.

Exhibit 87: Executive Turnover (1995-2007)



Source: Liberum Management Change Database, Deloitte analysis

[131] Chuck Lucier, Steven Wheeler, and Rolf Habbel, "The Era of the Inclusive Leader," *strategy+business*, Summer 2007: 1-16.

Although over the long term, executives leave their jobs at increasing rates, executive change, not surprisingly, fluctuates cyclically with corporate and market performance. But the correlation is the inverse of what one might expect. During periods of prosperity, such as from 2005 to 2007, Executive Turnover increased steadily, perhaps representing the wide range of opportunities available for executives leaving voluntarily. In downturns, this ready supply of new job opportunities dries up, lowering the turnover rate. Furthermore, boards may be reluctant to change top leaders during a deep recession because of the uncertainty and risk involved in quickly finding new talent—and because it might send a pessimistic signal to investors and other stakeholders.

No small part of the difficulty facing today's business leaders arises from running industrial-age corporations in the digital era.

This leaves executives in somewhat of a quandary. Should they try to make longer-lasting changes to the organizations they lead, even when their tenures (not to mention their performance incentives) are shorter term? One key might be to rethink executive compensation by tying it to longer-term performance measures.

Shift Index Methodology

114 Shift Index Overview

118 Shift Index Metrics Overview

133 Index Creation Methodology

Shift Index Methodology

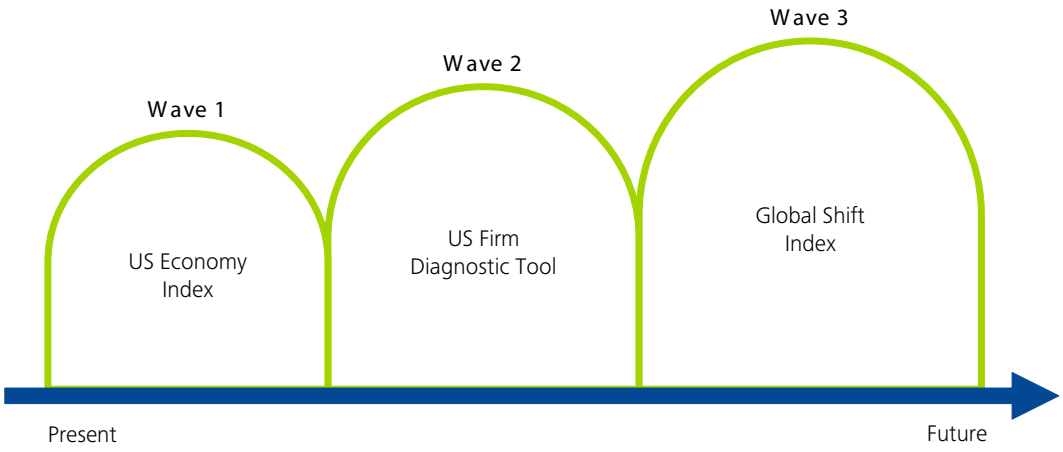
Shift Index Overview

The Deloitte LLP Center for the Edge (the Center) developed the Shift Index to measure long-term changes to the business landscape. The Shift Index measures the magnitude and rate of change of today's turbulent world by focusing on long-term trends, such as advances in digital infrastructure and the increasing significance of knowledge flows.

The 2009 release of the Shift Index not only focuses on the U.S. economy but also includes data gathering and analysis at the industry level. The Center for the Edge will publish a report in the fourth quarter 2009 exploring in greater detail how the Big Shift is affecting various U.S. industries.

Subsequent releases of the Shift Index, in 2010 and beyond, will broaden the index to a global scope and provide a diagnostic tool to assess performance of individual companies relative to a set of firm-level metrics. Exhibit 88 details these development phases.

Exhibit 88: Shift Index waves



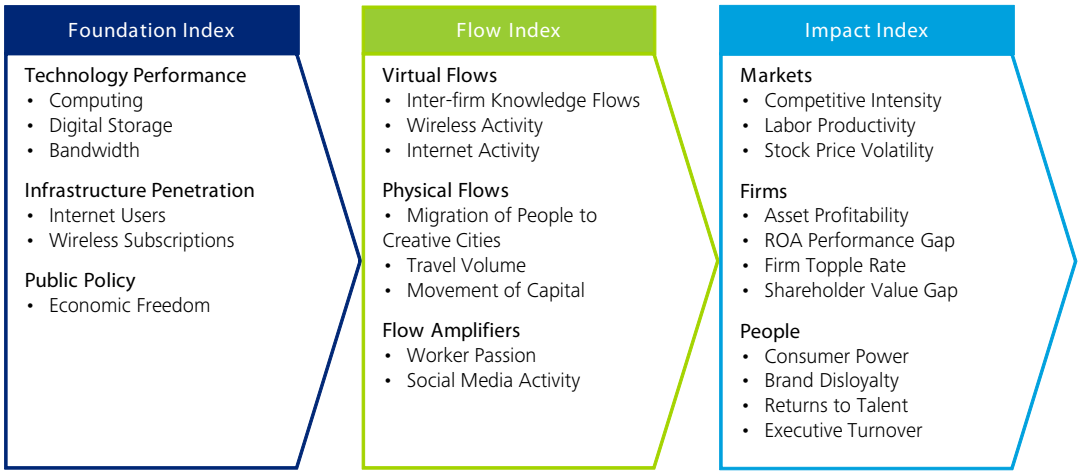
Source: Deloitte

Our research applied a combination of established and original analytical approaches to pull together four decades of data, both pre-existing and new. More than a dozen vendors and data sources were engaged, four surveys were developed and deployed, and five proprietary methodologies were created to compile 25 metrics into three indices representing 15 industries. Architects of current "gold standard" indices were consulted throughout the development process.

In compiling the Index, the Center identified and evaluated more metrics than could possibly be included. In some cases, the Center obtained metrics directly from vendors. In other cases, the Center leveraged existing studies and reproduced methodologies to construct metrics. Still others the Center constructed on its own.

Many of the metrics included in the Shift Index are proxies used to assess the concepts key to the Big Shift logic. For example, our Inter-Firm Knowledge Flow survey is an attempt to use a proxy to estimate total knowledge flows across firms. For the list of Shift Index metrics, please refer to Exhibit 89.

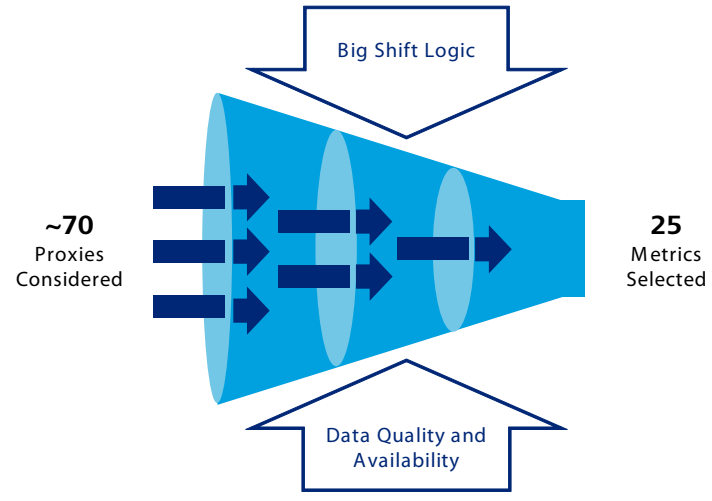
Exhibit 89: The Shift Index metrics



Source: Deloitte

To assemble the final list of 25 Shift Index metrics, we carefully analyzed more than 70 potential metrics, using a process detailed in Exhibit 90.

Exhibit 90: Shift Index metric selection process



Source: Deloitte

This process evaluated fit between potential metrics and the conceptual logic of the Big Shift. To measure geographic spikiness, for example, we started by evaluating U.S. urbanization and then measured the percentage of total population in metropolitan areas, the percentage of population in the top 10 largest cities, and the overall population density. Realizing that urbanization might not be an ideal measure to assess pull forces that certain geographic centers such as Silicon Valley and Washington, DC possess over other cities, we elected to apply Richard Florida's study of creative cities. The creative cities identified by Florida are the epicenters of diversity, talent, and tolerance. Thus, they represented places where people migrate to benefit from cognitive diversity and sharing of tacit knowledge. As the Big Shift takes further hold, we anticipate increased migration to the most creative cities, as compared to the least creative ones. Selecting the Migration of People to Creative Cities metric as a proxy for geographic spikiness seemed more appropriate and consistent with the logic of the Big Shift than using any general measure of U.S. urbanization.

Data quality and availability was another factor evaluated when selecting metrics. Proxies with outdated data or ones that are no longer maintained were discarded. For example, total factor productivity was a potential proxy for productivity improvements, but available data sources lacked industry-level information and had three-year data lags. These limitations led us to include Labor Productivity rather than total factor productivity in the Impact Index. For a representative list of metrics considered for the Shift Index, please refer to Exhibit 91.

Exhibit 91: Shift Index Proxies Considered but Not Selected

Component Index Driver	Proxies Considered
Foundation Index	
Technology Performance	• Market spending on hardware, software, and IT services (US$ per person) • Broadband connections (xDSL, ISDN PRI, FWB, cable, and FTTx) per person
Infrastructure Penetration	• Telecommunication equipment exports and imports (US$) • Percentage of automatic phone lines compared to the percentage of digital phone lines • Number of fixed telephone line subscribers per 100 inhabitants • Number of mobile cellular telephone subscribers per 100 inhabitants • Total fixed and cellular telephone subscribers per 100 inhabitants • Number of people within mobile cellular network coverage as a percentage of total population • Total number of personal computers • Percentage of homes with a Personal Computer • Internet users per 100 inhabitants • Total Internet subscribers (fixed broadband) per 100 inhabitants
Public Policy	• Number of regulations per industry • Number of new regulations per year

Component Index Driver	Proxies Considered
Flow Index	
Virtual Flows	• Number of joint ventures • Number of co-branded products • Patent citations • Percentage of time spent interacting with external business partners • Patent distribution • Open innovation participation • Bibliometric analysis –academic paper citations • People movement/immigration • International Internet bandwidth (Mbps) • International Internet bandwidth per inhabitant (bit/s)
Physical Flows	• Percentage of total population in metropolitan areas • Percentage of population in top 10 largest cities • Population density
Flow Amplifiers	• Total number of people participating in online communities • Total number of open sourced products • Total number of social networking sites • Total unique users engaged in social networking sites
Impact Index	
Markets	• Total factor productivity • Average time to complete a set of employee tasks • Firm distribution (startup vs. incumbent) • Number of new firms created • Number of days stock price has changed more than three STD from average of yearly returns
Firms	• Profit elasticity • Profit margin (EBITDA/revenue) • Economic margin • Return on invested capital • Shareholder value creation
People	• Rank shuffling by Interbrand Survey score • Minimum wage as percentage of value added per worker • Hiring patterns for top management team • Average compensation of senior executives • Median age (in years) of patents cited

Shift Index Metrics Overview

The following set of tables provides detailed descriptions of each metric used to compile the Shift Index, including metric definition, high level calculations, and primary data sources.

Foundation Index

Metric	Methodology
Technology Performance	
Computing	*Definition*: Computing measures the vendor cost associated with putting one million transistors on a semiconductor. The metric provides visibility into cost/performance associated with the computational power at the core of the Big Shift. *Calculations*: The metric was derived from Moore's Law, which furnishes insight into the basic computing performance curve. Initial insights were confirmed by direct observations of the number of transistors vendors are able to put on the most powerful commercially available semiconductors, an analysis of wholesale pricing for individual chips and as a breakdown component of servers, and an assessment of vendor margins to determine cost as a component of wholesale price. *Data Source:* The data were obtained from a number of publicly available sources of information about semiconductor performance as defined by millions of transistors per semiconductor including vendors, wholesale distributors of semiconductors, and leading technology research vendors.
Digital Storage	*Definition*: Digital Storage measures the vendor cost associated with producing one gigabyte (GB) of digital storage. The metric provides visibility into the cost/performance curve associated with digital storage allowing for the computational power at the core of the Big Shift. *Calculations:* The metric is described by Kryder's Law, which is derived from Moore's Law. Kryder's Law provides insight into the basic cost/performance curve that governs digital storage. Initial insights were confirmed by direct observations of the wholesale pricing for one GB of memory and an assessment of vendor margins to determine cost as a component of wholesale price. *Data Sources:* The data were obtained from a number of publicly available sources of cost information including vendors, wholesale distributors of digital storage, and leading technology research vendors

Metric	Methodology
Bandwidth	*Definition:* Bandwidth measures the vendor cost associated with producing Gigabit Ethernet/ Fiber (GbE-Fiber) as deployed in data centers. The metric provides visibility into the cost/ performance curve associated with the bandwidth that allows for the computational power at the core of the Big Shift. *Calculations:* Because technology performance in the Shift Index is designed to measure the impact of innovation and bandwidth, which is the result of a complex array of technologies that extend from the enterprise data center to the last mile into residential homes, this metric focuses on GbE–Fiber in the data center as the best commercially available example of bandwidth innovation. Initial insights were confirmed by direct observations of the wholesale pricing for GbE-Fiber and an assessment of vendor margins to determine cost as a component of wholesale price. *Data Sources:* The data were obtained from a number of publicly available sources of cost information including vendors, wholesale distributors of network equipment in the data center, and leading technology research vendors.
Infrastructure Penetration	
Internet Users	*Definition:* The Internet Users metric measures the number of "active" Internet users in the United States as a percentage of total U.S. population. "Active" users are defined as those who access Internet at least daily. The Internet Users metric is a proxy for the core technology adoptions. *Calculations:* Active Internet user data were obtained directly from a report published by comScore. comScore conducts monthly enumeration phone surveys to collect data on the Internet usage and user demographics. Each month, comScore utilizes data from the most recent wave of the surveys and from the 11 preceding waves to estimate the proportion of households in the United States with at least one member using the Internet and the average number of Internet users in these households. comScore then takes the product of these two estimates and compares it with the census-based estimate of the total number of households in the United States to assess total Internet penetration. *Data Sources:* The data were obtained from comScore's Media Metrics report.

Metric	Methodology
Wireless Subscriptions	*Definition:* The Wireless Subscriptions metric estimates the total number of active wireless subscriptions as a percentage of the U.S. population. The Wireless Subscriptions metric is a proxy for core technology adoption. *Calculations:* CTIA's semi-annual wireless industry survey (traditionally known as the CTIA "data survey") gathers industry-wide information from Commercial Mobile Radio Service (CMRS) providers operating commercial systems in the United States. Only companies with operational systems and licenses to operate facilities-based systems are surveyed. The Survey prompts respondents to answer the following question: "Indicate the number of subscriber units operating on your switch, which produce revenue. Include suspended subscribers that have not been disconnected. This number should not include subscribers that produce no revenue, such as demonstration phones and some employee phones." The CTIA survey requests the information on the number of revenue-generating wireless service subscribers and summarizes the result in the CTIA Wireless Subscriber Usage Report. Since the metric measures wireless subscriptions and not wireless subscribers, it is possible for the total number to exceed the overall U.S. population, as one person can have multiple wireless subscriptions. *Data Sources:* The data were obtained from the CTIA Wireless Subscriber Usage Report.
Public Policy	
Economic Freedom	*Definition:* The Economic Freedom metric measures how free a country is across 10 component freedoms: business, trade, fiscal, government size, monetary, investment, financial, property, labor, and, finally, freedom from corruption. The Economic Freedom metric is a proxy for openness of public policy and the degree of economic liberalization, which are both fundamental to either enabling or restricting Big Shift forces. *Calculations:* Each freedom component was assigned a score from 0 to 100, where 100 represents maximum freedom. The 10 scores were then averaged to gauge overall economic freedom. *Data Source:* The data were obtained from the 2009 Index of Economic Freedom by The Heritage Foundation and Dow Jones & Company, Inc., http://www.heritage.org/Index.

Flow Index

Metric	Methodology
Virtual Flows	
Inter-Firm Knowledge Flows	*Definition:* The Inter-Firm Knowledge Flows metric is a proxy for knowledge flows across firms. Success in a world disrupted by the Big Shift will require individuals and firms to participate in knowledge flows that extend beyond the four walls of the firm. *Calculations:* We explored the types and volume of inter-firm knowledge flows in the United States through a national survey of 3,201 respondents. The survey was administered online in March 2009. The results are based on a representative (90% confidence level) sample of approximately 200 (±5.8%) respondents in 15 industries, including 50 respondents (±11.7%) tagged as senior management, 75 (±9.5%) as middle management, and 75 (±9.5%) as front-line workers. In the survey, we tested the participation and volume of participation in eight types of knowledge flows: 1) In which of the following activities do you participate: • Use social media to connect with other professionals (e.g., blogs, Twitter, and LinkedIn) • Subscribe to Google alerts • Attend conferences • Attend Web-casts • Share professional information and advice over the telephone • Arrange lunch meetings with other professionals to exchange ideas and advice • Participate in community organizations • Participate in professional organizations 2) How often do you participate in each of the above professional activities? • Daily • Several times a week • Weekly • A few times a month • Monthly • Once every few months • Once a year • Less often than once a year The knowledge flow activities were normalized by the maximum possible participation for each activity (e.g., daily for social media and weekly for Web-casts). Thus, an Inter-Firm Knowledge Flow value was calculated for each individual based on his or her participation in knowledge flows. The average of these flows is the index value for the Inter-Firm Knowledge Flow value metric. *Data Sources:* Data were obtained from the proprietary Deloitte survey and analysis.

Metric	Methodology
Wireless Activity	*Definition:* The Wireless Activity metric measures the total number of wireless minutes and total number of SMS messages in the United States per year. The metric is a proxy for connectivity and knowledge flows. *Calculations:* CTIA's semi-annual wireless industry survey develops industry-wide information drawn from CMRS providers operating commercial systems in the United States. Only companies with operational systems and licenses to operate facilities-based systems are surveyed. Wireless minutes are estimated from the CTIA survey, which measures the total minutes used by subscribers. The CTIA survey asks wireless carriers to report the total number of billable calls, billable minutes (both local and roaming), and total SMS volume on the respondent's network. *Data Sources:* The data were obtained from the CTIA Wireless Subscriber Usage Report.
Internet Activity	*Definition:* The Internet Activity metric measures Internet traffic for the 20 highest capacity U.S. domestic Internet routes in gigabits/second. The metric is a proxy for connectivity and knowledge flows. *Calculations:* Internet volume data were obtained through TeleGeography, which determines Internet capacity and traffic data through confidential surveys, informal discussions, and follow-up interviews with network engineering and planning staff of major Internet backbone providers. *Data Sources:* The data were obtained from TeleGeography's Global Internet Geography Report.

Metric	Methodology
Physical Flows	
Migration of People to Creative Cities	*Definition:* The Migration of People to Creative Cities metric measures the increase in population in cities ranked as most creative as compared to the increase in population in cities ranked as least creative. The metric serves as a proxy for physical flow of people towards centers of creativity and innovation in order to access knowledge flows more effectively and intimately. *Calculations:* As one of the proxies for physical knowledge flows expressed through face-to-face interactions and serendipitous connections, we were measuring the growth in population, as provided by the U.S. Census Bureau, within creative cities, as defined by Richard Florida. The most and least creative cities are defined by Richard Florida in his book The Rise of the Creative Class. Each city with more than one million people in population is ranked by its creative index score. Florida determined the creative index score by adding three equally weighted components: technology, talent, and tolerance. U.S. Census Bureau data were used to determine the population of the cities defined by Florida as most and least creative. We defined the metric as a gap between the two groups' population. *Data Sources:* Florida's book, The Rise of the Creative Class and the U.S. Census Bureau http://www.census.gov/popest/cities/cities.html.
Travel Volume	*Definition:* The Travel Volume metric is defined as the volume of passenger travel. The metric serves as a proxy for physical flows of people and indicates levels of face-to-face interactions, which are more likely to drive the most valuable knowledge flows—those that result in new knowledge creation rather than simple knowledge transfer. *Calculations:* The Transportation Services Index (TSI) published by the Bureau of Transportation Statistics, the statistical agency of the U.S. Department of Transportation (DOT) is used to assess the volume of passenger travel. The passenger TSI measures the movement and month-to-month changes in the output of services provided by the for-hire passenger transportation industries. The seasonally adjusted index consists of data from passenger air transportation, local mass transit, and intercity passenger rail. *Data Sources:* U.S. Department of Transportation, Research and Innovation Technology Administration, Bureau of Transportation Statistics Transportation Services Index; http://www.bts.gov/xml/tsi/src/index.xml.

Metric	Methodology
Movement of Capital	*Definition:* The Movement of Capital metric measures the value of U.S. FDI inflows and outflows. The metric serves as a proxy for capital flows between the edge and the core. Edges are peripheral areas of geographies, demographic generations and technologies where growth and innovation tend to concentrate. The core is where the money is today. *Calculations:* Current dollar FDI inflows into the United States and outflows from the United States were summed. Absolute values were used to capture the total amount of flows regardless of the direction. The result was normalized by the size of the economy by dividing FDI flows by the U.S. GDP. This normalization will allow for comparability as we extend our index internationally. FDI stocks were excluded from the calculations as they do not directly represent the flows of capital. *Data Source:* The data were obtained from the United Nations Conference on Trade and Development (UNCTAD) FDI database with the 2008 value estimated based on the most resent publically available approximations and forecasts (http://stats.unctad.org/FDI/TableViewer/tableView.aspx?ReportId=1254).

Metric	Methodology
Flow Amplifiers	
Worker Passion	*Definition:* The Worker Passion metric measures how passionate U.S. workers are about their jobs. Passionate workers are fully engaged in their work and their interactions and strive for excellence in everything they do. Therefore, worker passion acts as an amplifier to the knowledge flows, thereby accelerating the growth of the Flow Index. *Calculations:* Our exploration of worker passion was designed around a national survey with 3,201 respondents. The survey was administered online in March 2009. The results are based on a representative (90% confidence level) sample of approximately 200 (±5.8%) respondents in 15 industries, including 50 respondents (±11.7%) tagged as senior management, 75 (±9.5%) as middle management, and 75 (±9.5%) as front-line workers. In the survey, we tested different attitudes and behavior around worker passion—excitement about work, fulfillment from work, and willingness to work extra hours—using the following six statements/questions: Please tell us how much you agree or disagree with each statement below relating to your specific job (7-point scale from strongly agree to strongly disagree): 1) I talk to my friends about what I like about my job. 2) I am generally excited to go to work each day. 3) I usually find myself working extra hours, even though I don't have to. 4) My job gives me the potential to do my best. 5) To what extent do you love your job? (7-point scale from a lot to not at all) 6) Which of the following statements best describes your current situation? • I'm currently in my dream job at my dream company. • I'm currently in my dream job, but I'd rather be at a different company. • I'm not currently in my dream job, but I'm happy with my company. • I'm not currently in my dream job, and I'm not happy at my company. A response was classified as a "top two" response if it was a 7 or 6 on the 7-point scales or a 1 or 2 on the last question. The respondents were then classified as "disengaged," "passive," "engaged,"and "passionate" based on the number of "top two" responses: • Passionate: 5-6 of the statements • Engaged: 3-4 of the statements • Passive: 1-2 of the statements • Disengaged: None of the statements The index value for Worker Passion is the percentage of "passionate" respondents to the number of total respondents. *Data Sources:* Data were obtained from the proprietary Deloitte survey and analysis.

Metric	Methodology
Social Media Activity	*Definition:* Social Media Activity is a measure of how many minutes Internet users spend on social media Web sites relative to the total minutes they spend on the Internet. The metric is a proxy for two- and multiple-way communication, which amplifies knowledge flows by offering the ability to collaborate. *Calculations:* comScore provides industry-leading Internet audience measurement that reports details of online media usage, visitor demographics, and online buying power for home, work, and university audiences across local U.S. markets and across the globe. Using proprietary data collection technology and cutting-edge methodology, comScore is able to capture great volumes of extremely granular data about online consumer behavior. comScore deploys passive, non-invasive measurement in its collection technologies, projecting the data to the universe of persons online. For the purposes of collecting data for our analysis, comScore defines social media as a virtual community within Internet Web sites and applications to help connect people interested in a subject. *Data Sources:* The data were obtained from comScore's Media Metrics report.

Impact Index

Metric	Methodology
Markets	
Competitive Intensity	*Definition:* The Competitive Intensity metric is a measure of market concentration and serves as a rough proxy for how aggressively firms interact. *Calculations:* The metric is based on the HHI, a methodology used in competitive and antitrust law to assess the impact of large mergers and acquisitions on the concentration of market power. Underlying the metric is the notion that markets where power is more widely dispersed are more competitive. This logic is consistent with the Big Shift, which predicts that industries will initially fragment as the traditional benefits of scale decline with barriers to entry. As strategic restructuring occurs, and companies begin to focus more tightly on a core business type, certain firms will once again begin to exploit powerful economies of scale and scope, but in a much more focused manner. *Data Source:* The metric was calculated by Deloitte, using data provided by Standard & Poor's Compustat on over 20,000 publicly traded U.S. firms (and foreign companies trading in American Depository Receipts). It is available annually and by industry sector through 1965.
Labor Productivity	*Definition:* The Labor Productivity metric is a measure of economic efficiency that shows how effectively economic inputs are converted into output. The metric is a proxy for the value creation resulting from the Big Shift and enriched knowledge flows. *Calculations:* Productivity data were downloaded directly from the Bureau of Labor Statistics database. The Bureau of Labor Statistics does not compute productivity data by the exact sectors analyzed in the Shift Index. Therefore, labor productivity by industry was derived using data published by the Bureau. Bureau data were aggregated by five, four, and sometimes three digit NAICS codes using Bureau methodology to map to the Shift Index sectors. Sector labor productivity figures were calculated as a ratio of the output of goods and services to the labor hours devoted to the production of that output. A sector output index was calculated using the Tornqvist formula (the weighted aggregate of the growth rates of the various industries between two periods, with weights based on the industry shares in the sector value of production). The input was calculated as a direct aggregation of all industry employee hours in the sector. *Data Sources:* The metric was based on the Bureau of Labor Statistics data. Major sector data are available annually beginning in 1947, and detailed industry data on a NAICS basis are available annually beginning in 1987.

Metric	Methodology
Stock Price Volatility	*Definition:* The Stock Price Volatility metric is a measure of trends in movement of stock prices. The metric is a proxy for measuring disruption and uncertainty. *Calculations:* Standard deviation is a statistical measurement of the volatility of a series. Our data provider, Center for Research in Security Prices (CRSP) at the University of Chicago Booth School of Business, provides annual standard deviations of daily returns for any given portfolio of stocks. Rather than using an equal-weighted approach, we used value-weighting. According to CRSP: "In a value-weighted portfolio or index, securities are weighted by their market capitalization. Each period the holdings of each security are adjusted so that the value invested in a security relative to the value invested in the portfolio is the same proportion as the market capitalization of the security relative to the total portfolio market capitalization" (http://www.crsp.com/support/glossary.html). *Data Sources:* Established in 1960, CRSP maintains the most complete, accurate, and user-friendly securities database available. CRSP has tracked prices, dividends, and rates of return of all stocks listed and traded on the New York Stock Exchange since 1926, and in subsequent years, it has also started to track the NASDAQ and the NYSE Arca. http://www.crsp.com/documentation/product/stkind/calculations/standard_deviation.html
Firms	
Asset Profitability	*Definition:* Asset Profitability (ROA) is a widely used measure of corporate performance and a strong proxy for the value captured by firms relative to their size. *Calculations:* In the Shift Index, Asset Profitability is an aggregate measure of the net income after extraordinary items generated by the economy (defined as all publicly traded firms in our database) divided by the net assets, which includes all current assets, net property, plants, and equipment, and other non-current assets. Net income in this case was calculated after taxes, interest payments, and depreciation charges. *Data Sources:* The metric was calculated by Deloitte, using data provided by Standard & Poor's Compustat on over 20,000 publicly traded U.S. firms (and foreign companies trading in American Depository Receipts). It is available annually and by industry sector through 1965.

Metric	Methodology
ROA Performance Gap	*Definition:* The ROA Performance Gap tracks the bifurcation of returns flowing to the top and bottom quartiles of performers and is a proxy for firm performance. *Calculation:* This metric consists of the percentage difference in ROA between these groups and is a measure of how value flows to or from "winners" and "losers" in an increasingly competitive environment. *Data Sources:* The metric is based on an extensive database provided by Standard & Poor's Compustat. It was calculated by Deloitte. The metric is available annually and by industry sector through 1965.
Firm Topple Rate	*Definition:* The Firm Topple Rate measures the rate at which companies switch ranks, as defined by their ROA performance. It is a proxy for dynamism and upheaval and represents how difficult or easy it is to develop a sustained competitive advantage in the world of the Big Shift. *Calculations:* To calculate this metric, we used a proprietary methodology developed within Oxford's Said School of Business and the University of Cologne that measures the rate at which firms jump ranks normalized by the expected rank changes under randomness. A topple rate close to zero denotes that ranks are perfectly stable and that it is relatively easy to sustain a competitive advantage, whereas a value near one means that ranks change randomly, and that doing so is uncommon and incredibly difficult. We applied this methodology to firms with more than $100 million in annual net sales and averaged the results from our 15 industry sectors to reach an economy-wide figure. *Data Sources:* This metric is based on data from Standard & Poor's Compustat. It was calculated annually and by industry sector through 1965.

Metric	Methodology
Shareholder Value Gap	*Definition:* The Shareholder Value Gap metric is defined in terms of stock returns, and it aims to quantify how hard it is for companies to generate sustained returns to shareholders. It is another assessment of the bifurcation of "winners" and "losers." *Calculations:* The calculation uses the weighted average TRS percentage for both the top and bottom quartiles of firms in our database, in terms of their individual TRS percentages, to define the gap. Total returns are annualized rates of return reflecting price appreciation plus reinvestment of monthly dividends and the compounding effect of dividends paid on reinvested dividends. *Data Sources:* The metric is based on Standard & Poor's Compustat data and is available annually and by industry sector through 1965.
People	
Consumer Power	*Definition:* The Consumer Power metric measures the value captured by consumers. In a world disrupted by the Big Shift, consumers continue to wrestle more power from companies. *Calculations:* A survey was administered online in March 2009 to a sample of 2,000 U.S. adults (at least 18 years old) who use a consumer category in question and can name a favorite brands in that category. The sample demographics were nationally balanced to the U.S. census. A total of 4,292 responses were gathered as consumers were allowed to respond to surveys on multiple consumer categories. A total of 26 consumer categories were tested with approximately 180 (±6.2%, 90% confidence level) responses per category. We studied a shift in Consumer Power by gathering 4,292 responses across 26 consumer categories to a set of six statements measuring different aspects, attributes, and behaviors involving consumer power: • There are a lot more choices now in the (consumer category) than there used to be. • I have convenient access to choices in the (consumer category). • There is a lot of information about brands in the (consumer category). • It is easy for me to avoid marketing efforts. • I have access to customized offerings in the (consumer category). • There isn't much cost associated with switching away from this brand. Each participant was asked to respond to these statements on a 7-point scale, ranging from 7=completely agree to 1=completely disagree. An average score was calculated for each respondent and then converted to a 0–100 scale. The index value for the Consumer Power metric is the average consumer power score of all respondents. *Data Sources:* Data were obtained from the proprietary Deloitte survey and analysis.

Metric	Methodology
Brand Disloyalty	*Definition:* The Brand Disloyalty metric is another measure of value captured by consumers. As a result of increased consumer power and a generational shift in reliance on brands, the Brand Disloyalty measure is an indicator of consumer gain stemming from the Big Shift. *Calculations:* A survey was administered online in March 2009 to a sample of 2,000 U.S. adults (at least 18 years old) who use a consumer category in question and can name a favorite brands in that category. The sample demographics were nationally balanced to the U.S. census. A total of 4,292 responses were gathered as consumers were allowed to respond to surveys on multiple consumer categories. A total of 26 consumer categories were tested with approximately 180 (±6.2%, 90% confidence level) responses per category. We studied a shift in Brand Disloyalty by gathering 4,292 responses across 26 consumer categories to a set of six statements measuring different aspects, attributes, and behaviors involving brand disloyalty: • I would consider switching to a different brand. • I compare prices for this brand with other brands. • I seek out information about other brands. • I ask friends about the brands they use. • I switch to the brand with the lowest price. • I pay attention to advertising from other brands. Each participant was asked to respond to these statements on a 7-point scale, ranging from 7=completely agree to 1=completely disagree. An average score was calculated for each respondent and then converted to a 0–100 scale. The index value for the Brand Disloyalty metric is the average brand disloyalty score of all respondents. *Data Sources:* Data were obtained from the proprietary Deloitte survey and analysis.

Metric	Methodology
Returns to Talent	*Definition:* The Returns to Talent metric examines fully loaded compensation between the most and least creative professions. The metric is a proxy for the value captured by talent. *Calculations:* The most and least creative occupations were leveraged from Florida's study. A fully loaded salary (cash, bonuses, and benefits) was calculated for each group, and the differences were measured. *Data Sources:* The most and least creative occupations were obtained from Florida's book The Rise of the Creative Class. Fully loaded salary information was gathered from the Bureau of Labor Statistics data leveraging the Occupational Employment Statistics (OES) Department and Employer Cost for Employee Compensation information (ECEC). The analysis was performed by Deloitte. ECEC: http://www.bls.gov/ect/home.htm OES: http://www.bls.gov/OES/ Creative Class Group: http://www.creativeclass.com/
Executive Turnover	*Definition:* The Executive Turnover metric measures executive attrition rates. It is a proxy for tracking the highly unpredictable, dynamic pressures on the market participants with the most responsibility—executives. *Calculations:* The data were obtained from the Liberum Research (Wall Street Transcript) Management Change database and measures the number of executive management changes (from a board of director through vice president level) in public companies. For the purposes of this analysis, we summed the number of executives who resigned from, retired, or were fired from their jobs and then normalized that one number, each year from 2005 to 2008, against the number of total management occupational jobs reported by the Bureau of Labor Statistics (Occupation Employment Statistics) for each of those years. Liberum Research's Management Change Database is an online SQL database. Each business day, experts examine numerous business wire services, government regulatory filings (e.g., SEC 8K filings), business periodicals, newspapers, RSS feeds, corporate and business-related blogs, and specified search alerts for executive management changes. Once an appropriate change is found, Liberum's staff inputs the related management change information into the management change database. Below are the overall management changes tracked by Liberum: • I - Internal move, no way to differentiate if the move is lateral, a promotion, or a demotion • J - Joining, hired from the outside • L - Leaving, SEC 8K or press release contains information that states individual has left the firm; no indication of a resignation, retirement, or firing • P - Promotion, moved up the corporate ladder • R - Resigned/retired • T - Terminated *Data Sources:* Liberum Research (a division of Wall Street Transcript); http://www.twst.com/liberum.html OES: http://www.bls.gov/OES/

Index Creation Methodology

After a rigorous data collection process, we made several adjustments to the data to create the final Shift Index. To ensure that each metric has an appropriate impact on the overall index and to focus on secular, long-term trends, we performed five steps:

Classifying Metrics

A key challenge in assembling the index is being able to combine metrics of different magnitudes, trends, and volatility in a sensible way. The first step in this process involves carefully evaluating each metric with respect to historical trends, future projections, and qualitative research and classifying it as either "secular non-exponential," meaning any non-exponential metric with a defined or assumed long-term trend, or "exponential," which pertains to metrics such as Computing and Wireless Activity. With these classifications, we then apply one of two smoothing/transformation methodologies to make the metrics statistically comparable.

Smoothing Metric Trends and Volatility

Metrics that are classified as exponential present a particular challenge, in that their rapid growth can overwhelm slower moving metrics in the index. At the same time, accurately representing trends in the underlying data is critical, especially those related to technology and knowledge flows, whose exponentiality is at the core of the Big Shift. Our solution to these concerns is exactly the middle ground: We dampen exponential metrics, but not so much as to make them linear. To do this, we use a Box-Cox Transformation (a commonly accepted technique for normalizing exponential functions), which uses a transformation coefficient to effectively reduce their growth rate. All exponential metrics are transformed using the same coefficient in order to preserve the relative differences between them.

For secular non-exponential metrics, we engage in a different kind of dampening: smoothing out volatility to focus the index on long-term trends. This is of particular concern in the Impact Index, which contains a number of metrics that are highly volatile in the short term, but over the long run show defined trends. Stock Price Volatility, for example, swings wildly, but is also trending upward over time; the latter is what we want the Impact Index to represent. On the other hand, Labor Productivity moves very little, so any large fluctuations are critically important to include. Essentially, the degree to which we want to smooth secular non-exponential metrics depends on how volatile they typically are.

To make this assessment, we calculate something called a "deviation score" for each metric of this type, which represents how much (on average) it deviates from its long-term trend line. This score sets the "threshold" for how much volatility we allow through to the final index.

We do this by revising the raw values to represent a combination of (a) the value predicted in a given year by linear regression and (b) the difference between the raw value and the predicted one (e.g., volatility). The former is always given a weight of one, but the latter is dynamic: This is where the deviation score comes in. The higher the deviation score, the less weight is given to this difference. Before indexing, the contribution of Movement of Capital (which is highly volatile and, by extension, has a high deviation score) to the index in a given year is 100 percent of the predicted value and a small percentage of the deviation around that mean. By the same token, Labor Productivity, which fluctuates much less, contributes a very large percentage of that deviation in addition to 100 percent of its predicted value.

Because our next step is to index these values to a base year (2003)—which will be discussed in the next section—this artificial inflation or deflation has no impact on the index and instead serves only to minimize or preserve volatility in the underlying data.

Normalizing Rates of Change

After smoothing exponential and non-exponential metrics to make them comparable and to represent long-term trends, we normalize each metric by indexing it to 2003. This process refocuses the Shift Index from magnitudes to rates of change, which is in the end what we are trying to measure.

By choosing 2003 as a base year, we can easily evaluate rates of change in the past five years. In addition, historical

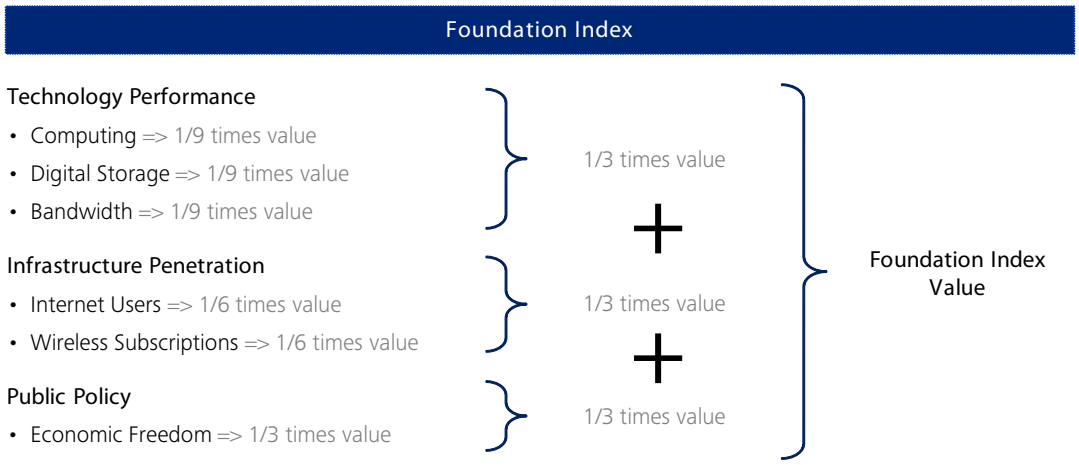
data are available for nearly all 25 metrics by 2003, limiting the need for estimation to back-test the index. However, those metrics that did not have historical data starting in 2003 (e.g., our four proprietary survey metrics, Internet Activity, and Social Media Activity) are indexed to 2008. This last difference in indexing treatment accounts for the less-than-100 value of the Flow Index in 2003.

Weighting Metrics to Reflect the Logic

The final step before calculating the Foundation Index, Flow Index, and Impact Index is properly weighting each metric to ensure each driver (key concept) contributes equally to the index. This process is detailed in Exhibit 92, but to clarify, the Foundation Index contains three drivers: Technology Performance, Infrastructure Penetration, and Public Policy. Each of these contains different numbers of metrics, but overall, they represent three core concepts about what forces are driving foundational shifts. As such, we want to give equal weights to each concept, regardless of how many metrics it contains. To do this, each metric is assigned a weight based on the number of metrics in its respective driver (Technology Performance contains three metrics, so one-third) times one-third again, representing the fact that Technology Performance accounts for an equal share of the Foundation Index.

In addition to preserving the logic, what this system allows us to do is add and subtract metrics in future years without needing to materially restructure the index. Additionally, when the Shift Index is released on a global scale, it provides room to choose geographically relevant metrics and proxies while maintaining comparability with the U.S. index.

Exhibit 92: Shift Index weighting methodology



Source: Deloitte

Other Tools: Correlation Model

To explore conceptually plausible relationships in and among various Shift Index metrics, as well as with macro-economic indicators, we also conduct a simple quantitative exercise to identify the strength of these relationships and the subsequent correlations or degrees of linear dependence. The formula and function we use to calculate the correlation coefficient for a sample uses the covariance of the samples and the standard deviations of each sample. To obtain the most accurate results, we only note quantitative correlation relationships between data sets with a time series of at least three years and an identifiably linear trend.

To be clear, this approach and our assertions do not imply causality. Two data sets might be related and have a strong correlation, but could be independently related to another variable or not conceptually related at all. We invite others to join with us and engage in further exploration and rigorous analyses where interesting insights might be developed further.

Correlations greater than .60 (signifying an increasing linear relationship) or less than -.60 (signifying a decreasing linear relationship) are considered to be significant and worthy of applying conceptual logic and/or further exploration. For example, the results of this basic analysis show a significant positive correlation between the Heritage Foundation's business freedom and GDP (.69) and between the Heritage Foundation's business freedom and Competitive Intensity (.88). Because business freedom is defined as the "ability to start, operate, and close businesses that represents the overall burden of regulations and regularity efficiency," it seems plausible that as business freedom increases, there is greater opportunity to create economic value, for the regulatory environment encourages growth while at the same time creating a more competitive environment due to lower barriers to entry and participation.

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- Brian Arthur, Santa Fe/Stanford
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Deloitte Center for the Edge

The Center focuses on the boundary, or edge, of the global business environment where strategic opportunity is the highest

The Deloitte Center for the Edge conducts original research and develops substantive points of view for new corporate growth. The Silicon Valley-based Center helps senior executives make sense of and profit from emerging opportunities on the edge of business and technology. Center leaders believe that what is created on the edge of the competitive landscape—in terms of technology, geography, demographics, markets—inevitably strikes at the very heart of a business. The Center's mission is to identify and explore emerging opportunities related to big shifts that aren't yet on the senior management agenda, but ought to be. While Center leaders are focused on long-term trends and opportunities, they are equally focused on implications for near-term action, the day-to-day environment of executives.

Below the surface of current events, buried amid the latest headlines and competitive moves, executives are beginning to see the outlines of a new business landscape. Performance pressures are mounting. The old ways of doing things are generating diminishing returns. Companies are having harder time making money—and increasingly, their very survival is challenged. Executives must learn ways not only to do their jobs differently, but also to do them better. That, in part, requires understanding the broader changes to the operating environment:

- What's really driving intensifying competitive pressures?
- What long-term opportunities are available?
- What needs to be done today to change course?

Decoding the deep structure of this economic shift will allow executives to thrive in the face of intensifying competition and growing economic pressure. The good news is that the actions needed to address near-term economic conditions are also the best long-term measures to take advantage of the opportunities these challenges create. For more information about the Center's unique perspective on these challenges, visit www.deloitte.com/centerforedge.

John Hagel (Co-Chairman) has nearly 30 years' experience as a management consultant, author, speaker and entrepreneur, and has helped companies improve their performance by effectively applying information technology to reshape business strategies. In addition to holding significant positions at leading consulting firms and companies throughout his career, Hagel is the author of a series of best-selling business books, including Net Gain, Net Worth, Out of the Box and The Only Sustainable Edge.

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Lang Davison (Executive Director) joined Deloitte from McKinsey & Company, where he was editor of its flagship publication, The McKinsey Quarterly. During his 14 years at McKinsey, Lang served in a variety of senior communications, content and media roles, leading the development team for mckinseyquarterly.com, which he edited from 1998 to 2003. He was the collaborating writer for the best-selling and critically acclaimed books Net Gain and Net Worth and for more than 300 articles in The McKinsey Quarterly, Harvard Business Review, Financial Times and The Wall Street Journal.

The 2009 Shift Index focuses attention on both long-term challenges and opportunities facing executives and policy makers. Foundational shifts are significantly intensifying competition, leading to growing performance pressures extending well beyond the current economic downturn. As the Index reveals, companies to date have generally found it very difficult to respond effectively to these performance pressures. On the other hand, the same foundational changes create new opportunities to accelerate performance improvement. The key is to find ways to participate more effectively in richer and more diverse knowledge flows. Adapting our institutions and our practices to the long-term shifts around us will be the key in turning challenge into opportunity.

This Index puts a number of key questions on the leadership agenda: Are companies organized to effectively generate and participate in a broader range of knowledge flows, especially those that go beyond the boundaries of the firm? How can they best create and capture value from such flows? And most importantly, how do they measure their progress navigating the Big Shift in the business landscape? We hope that the Shift Index will help executives answer those questions—in these difficult times and beyond.