

---

**COLLEGE OF BUSINESS**  
**OFFICE OF BUSINESS OUTREACH**



**White Paper #10      March 2009**

---

This is true: fact is king. Information is king. Great reporting is what every honest person wants now... Facts and data are our product, we're putting everything into reporting, that's what we're selling, interpretation is the reader's job...  
~Peggy Noonan~

The Office of Business Outreach's series of informational articles are designed to provide a reader-friendly overview of current issues that impact the business community. Please feel free to reproduce and distribute this booklet for business, educational or research purposes. We do ask, however, that you provide proper credit to the Office of Business Outreach for this material. Unauthorized use, translation, or sale of this material is not permitted

---

**Office of Business Outreach**  
**College of Business**  
**P.O. Drawer 5288**  
**Mississippi State, MS 39762-5288**  
**(662) 325-3817**  
**[bizservices@cobilan.msstate.edu](mailto:bizservices@cobilan.msstate.edu)**

---

## **Innovation Economics 101**

### *Executive Summary*

While the US economy is at present indisputably in crisis--and by no means alone in this—it is far from permanently crippled. Despite the fact that the US invests proportionally less money and manpower than other nations into research and development, the openness of this economy allows entrepreneurs to flourish. US economic strength is driven--especially in the creation of new jobs--by the innovation of small businesses, and by the ability of entrepreneurs to use technology developed by others to meet the needs of consumers. So despite the current worldwide recession, our greatest asset remains our open market and the pursuit of innovation it inspires.

# Innovations Economics 101

*Third-class companies make products;  
second-class companies develop technology;  
first-class companies set standards<sup>1</sup>*

## Introduction

Yes, times are tough, very tough. There's no denying that. But we're not going to repeat the litany of problems plaguing the world economy. Most all of us already know them by heart. Instead, we are going to begin this paper by pointing out that these difficult times will pass. There should be little doubt of that. And one of the keys to future success is to be ready when the good times do return. Indeed, crises such as this offer incredible opportunity, but only for those who are prepared to seize it.

This means that *companies cannot continue doing what they have always done*. A professor here at Mississippi State came up with a good summary of the current business environment. He says companies today can "innovate, immigrate, or evaporate." Of the three choices, the first one – innovate – is clearly in the best interests of our country. Perhaps the following quote says this best:

*Worldwide, we [the U.S.] are producing more of the same things we have known how to produce for a long time, except that we are now using worldwide resources. The reality is that we will see a constant decline in manufacturing wages or fewer jobs available locally unless we have a culture of innovation – a passion to constantly ask "Why?", find the answers, and respond with "Why not?" Conceive of new "things" – new products – and conceive of new ways to make the things – new processes. Then repeat the processes – new or old – more and more efficiently, cutting the cost, time, and inefficiency between steps. . .In the Global economy, a competitive infrastructure will require a fundamental re-thinking of available local resources, finding new ways to integrate them into a larger manufacturing resource, and developing means to aggregate them for the common good. As the cost of information processing and physical logistics – a large fraction of which are the result of human efforts today – continues to decline, manufacturing new "things" using "new processes", rich with digital technology applications, will soar to new heights around the world (1) .*

While few will argue with these sentiments, many are likely to say that now is not the time to take risks. That given the current financial, economic, and credit crises, the more prudent course is to "hunker down." Cut out all the frills, remove all the bells and whistles, be conservative, and as Darrell Royal, the legendary football coach at Texas used to say, "dance with the one that brung ya." In other words, stick to what you best know how to do. But before reaching such a conclusion, let's look at history, at some of the most difficult economic times our country has ever experienced. After doing this, we'll talk about the government's role in the process of innovation, and then look at the real drivers of innovation in this country: small businesses and entrepreneurs.

## A History Lesson

As we noted in last month's white paper (*Small Business in 2018: Manufacturing Trends*), we are in a "structural break." These breaks are extremely painful, as the old rules of the game have been broken and the new rules are not yet in place. But structural breaks are part of economic life; they have occurred several times before, and they will occur again. Not surprisingly, perhaps, these breaks are virtual incubators of innovation. As the old saying goes, "desperate times call for desperate measures." Consider the following events (most of which bear remarkable similarity to our current situation):

---

<sup>1</sup> A popular saying in contemporary Chinese business and government circles, thought to have originated with Sony (50).

**The Panic of 1837:** In 1836 a presidential decree was issued that ordered the U.S. Treasury to no longer accept paper notes as payment for public land purchases. Shortly thereafter, financial institutions restricted credit and called in loans, which in turn led to runs on banks. Unemployment skyrocketed and food riots occurred in a number of large cities. Construction companies were unable to meet their obligations, sparking the failure of railroad and canal projects, and the ruin of thousands of land speculators. The impact of the subsequent depression lingered until 1843 (2).

Still, it was in 1837 that an Irish candle maker and an English soap maker started a small household goods business in Cincinnati, Ohio. Just as consumers were tapped out financially, these two entrepreneurs started a company that provided products and services of superior quality and value. Think about that – offering quality products instead of inexpensive (“cheap”) items to cash-strapped consumers. This is a recipe for failure, or so it would seem. But by 2007 this business would occupy the 10<sup>th</sup> place in *Fortune* magazine’s Most Admired Companies list. In case you haven’t guessed it – it is Procter & Gamble.

**The Panic of 1873:** It began in Europe, but by the fall of 1873 a severe economic downturn was at our shores. These troubles came to a head with the failure of Jay Cooke & Co., the country’s preeminent investment banking concern. This touched off a series of events that spread across the entire nation. The New York Stock Exchange closed for 10 days. Credit dried up, foreclosures were common, and banks failed. Factories closed their doors, costing thousands of workers’ jobs. The volume of destitute people soon overwhelmed the abilities of charities to function. Most of the major railroads failed. The years after the Civil War witnessed frenetic, unregulated growth with the government playing no role in curbing abuses. More than any other single event, the extreme overbuilding of the nation’s railroad system laid the groundwork of the Panic and the depression that followed (3).

Naturally, smart people would have done the tried and true – hunker down, cut spending, concentrate on the basics. But fortunately one resident of Menlo Park, NJ, was not that smart. In 1873 this individual open a laboratory devoted to pure research, to innovation. Six years of tinkering later, the laboratory produced its first product. In 1896 this was one of the first 12 companies to be included on the Dow Jones Industrial Average. Today it is the only remaining company of the original twelve. Of course, this is General Electric.

**The Long Depression, 1873-1896:** Although the causes of this Depression are debated, a primary reason was the tight monetary policy that the U.S. followed to get back to the gold standard after the Civil War. By taking money out of circulation, there were fewer available dollars to facilitate trade. At about this same time the Vienna Stock Exchange collapsed. Additionally, the government’s tight monetary policy caused the price of silver to fall, which in turn caused considerable losses of asset values, making investors reticent to make long-term loans. U.S. banks collapsed twice during this period.

Clearly no rational person would invest money in pure research or new technologies. Who could afford such a risk? Apparently at least three people could. One helped develop a time clock for recording workers’ hours. Another individual saw the need for a tabulating machine to keep track of the huge number of immigrants coming to the U.S. And another realized that businesses needed commercial scales. These three merged in 1911 and became the Computing-Tabulating-Recording Company. Recognize the name? If not, then perhaps the name they adopted a few years will be more familiar: IBM. Enough said about that.

**The Panic of 1907:** In the summer of 1907, the American economy clearly was stressed as a number of businesses and Wall Street brokerages went bankrupt. In October, the respected Knickerbocker Trust in New York City and the Westinghouse Electric Company both failed, touching off a series of events known as the Panic of 1907. In the wake of the initial business collapses, stock market prices plummeted and depositors made massive runs on the nation’s banks. The U.S. Treasury pumped millions of dollars into weak banks in a failed effort to save them. At the same time, J.P. Morgan led a group of leading bankers and financial experts in a successful effort to channel money from strong institutions to weaker ones (4).

Could there possibly be a worse time to introduce a new product? Especially a product that would compete against one of the mainstays of our economic system? After all, the horse and buggy had

served the nation for centuries. But apparently one Michigander failed to realize just how bad these times were. This entrepreneur embraced a new technology called the “automobile” and in 1908 founded a car company. He also used this period of economic disruption to acquire a number of companies. While it is now facing severe difficulties, for decades this was the epitome of U.S. industrial power. This is General Motors.

**The Great Depression:** The U.S. looked strong and its future bright at the beginning of 1929. But serious trouble lay just beneath the surface. A depression had already sprouted on the American farm and in certain industries. And just nine months after the Hoover inauguration, the nation sustained the most ruinous business collapse in its history on that infamous Black Monday. Following Wall Street’s crash, the U.S. continued to decline steadily into the most profound depression of our history. Banks failed and millions of citizens suddenly had no savings. Factories locked their gates; shops were shuttered forever; and most remaining businesses struggled to survive. Local governments faced great difficulty with collecting taxes to keep services going (5).

Yet in the midst of this chaos, an aerospace giant was born. A small group of entrepreneurs identified one of the few sectors in the country that was not floundering. Indeed, they recognized what history now refers to as the “Golden Age of Aviation.” The company they founded began life as a holding company for airlines, airplane parts manufacturers, and aviation companies such as Boeing. Today this holding company is one of the world’s leading diversified industrial manufacturers: United Technologies.

**The Recession of 1958:** Coming on the heels of the Recession of 1953, this one was marked by high unemployment rates, failing businesses, and massive program failures (6). Unlike typical recessions, this one saw a rise in inflation. Both consumer and wholesale prices rose steadily from 1957 to 1959 (7). Then, like now, auto sales fell off a cliff – a 31% decline. Unemployment in Detroit stood at a high of 20% by April 1958. Repossession rates of unemployed worker’s furniture, cars, and appliances were 18% higher than in the previous year. Similarities to the Great Depression were hard to miss. Movie houses offered cheaper admissions for holders of unemployment-compensation cards. Several stayed open all night, reviving the Depression custom of letting movie houses serve as places for shelter and a nap. Groceries advertised another depression standby: day-old bread (8).

Rising prices and unemployment obviously meant consumers wanted only the basics, the “stripped down” models of everything. Or did they? In 1958 Chevrolet introduced the Impala. This was the company’s most expensive full-size car. It had a new, upmarket sporty trim package that included six taillights, unlike its competitors with two lights on a side. From the time of its introduction through 1996, Impala sales exceeded 13 million, more than any other full-size car in the history of the automobile. As point of contrast, recall that Ford also introduced the Edsel in that year (9). Taking a smart risk is one thing, taking a poorly planned risk is something altogether different.

**The Oil Crisis of 1973:** Remember the gas lines that stretched for blocks? Remember when you could buy gas only on an odd- or even-numbered day, depending on the numbers on your license plate? The world truly changed on October 15, 1973, when OPEC, Egypt, and Syria announced an oil embargo to protest U.S. support of Israel during the Yom Kippur War. Gas soared to a national average of \$0.567 (\$2.30 in 2008 dollars) by 1975 (10). Unemployed hit 9%, inflation reached 11% (and would continue increasing for several more years), and the stock market fell by 48 percent.

Naturally, no one in his or her right mind would start a business at this time that relied on petroleum-fueled transportation, a business that was totally and absolutely dependent on an abundance of gasoline, diesel, and jet fuel. But such a company was founded. One which subsequently revolutionized global business practices with one of the most innovative business models in the country’s history. It officially began operations on April 17, 1973, with the launch of 12 small aircraft (think “gas guzzlers”) carrying 186 packages to 25 cities (11). The founder of this company was the innovative Frederick W. Smith. The company, of course, is Federal Express.

And who does not recognize the duo of Bill Gates, a Harvard University dropout, and Paul Allen who founded Microsoft in Albuquerque, New Mexico on April 4, 1975 (12).

**The Reagan Recession:** In early 1980 the Federal Reserve tightened its monetary policy to combat an inflation rate that had soared to 13.5 percent. The federal funds rate rose to 20% by the middle of the year, while the prime interest rate hit 21.5% in June 1982. The economy reacted with job losses in housing, steel and automotive sectors such that, by end of 1982, the unemployment rate was 10.8 percent. This recession also produced the Savings and Loan Crisis. Well over 400 S&Ls were insolvent by the end of 1982 (13).

With the words "Ladies and gentlemen, rock and roll," spoken on camera by one of its creators, MTV was alive and running as of August 1, 1981. Prophetically, the first video aired was "Video Killed the Radio Star" by the Buggles (14). Just over a year earlier, another revolutionary cable program appeared. Called "the greatest achievement in the history of journalism" by Ted Turner, its brash founder, CNN began broadcasting on June 1, 1980 (15). Also, Advanced Mobile Phone Service, a subsidiary of AT&T, was granted its license in 1982; a year later, the first commercial cell phone service was offered by Illinois Bell (16). The world of communications would never again be the same.

**The Bursting of the Dot.Com Bubble:** The early years of this century were eventful, to say the very least. On March 10, 2000, the NASDAQ peaked at 5132.52, a level not even remotely approached since then. On December 2, 2001, Enron declared bankruptcy. On July 21, 2002, WorldCom filed for Chapter 11 protection. "Perp" walks and jail sentences for multi-millionaire executives would follow shortly. And of course, on September 11, 2001, the world quit spinning, as the songs says. Although relatively mild and short, the recession of these early years was characterized by large layoffs, outsourcing, and a jobless recovery (17).

But think about what was also occurring during this period. In January 2000, there were 72 million Internet hosts. Just three years later that number had skyrocketed to 172 million. This led to the blossoming of start-up companies such as eBay, Amazon, and Google - companies with truly unique and innovative business models. Products as diverse as Apple's iPod and NASA's Mars Rovers all appeared in the first years of this new century. Once again, and like today, we were down but far from out.

## Innovation, Trade and Economic Policies

Clearly periods of economic upheaval – these "structural breaks" - can spawn new, innovative ways of looking at things, and new, innovative business models. The examples above all illustrate the role of entrepreneurs in the development of these things. But does the federal government have a part to play in the innovation process? And if it does, what should that role be like? Below we'll look at three roles governments around the world have adopted at various times.

**Techno-Nationalism:** Some governments, most notably Japan's, have used an approach known as **techno-nationalism** to encourage innovation. Here the central government identifies and "targets" strategic (usually high-tech) industries and gives them governmental supports such as: government procurements, import restrictions, export subsidies, R&D subsidies and tax credits, control on inward foreign investments, protection of intellectual properties, government-funded R&D projects, anti-dumping measures and other, all in order to strengthen the competitiveness of selected domestic industries against foreign competitors (18). It was this extensive involvement of government with the private sector that led to the coinage of the term "**Japan, Inc.**" in the 1980s. During this period two of the targeted industries - the consumer electronics and auto industries - threatened and then overtook their Western counterparts. One of its basic premises of techno-nationalism is that by increasing national R&D funding, rates of innovation increase and thereby improve national economic and technological performance (19).

While Japan is the "poster child" for techno-globalism, it is by no means the only country that practices this philosophy. China has been increasing its technology R&D spending for target industries and sectors such as missile and space technology. Moreover, Beijing is seeking new international technical standards to allow its companies to bypass foreign patents, and is perceived as threatening the U.S. lead in technology (20).

**Techno-Globalism:** Somewhat the diametric opposite to the Japanese approach is that of **techno-globalism**. Techno-globalism basically epitomizes Thomas Friedman's epistle **The World is Flat**. This kind of level playing field encourages technology (and perhaps even more importantly, capital) to cross national borders that in many ways no longer exist. The following quote probably best describes this flow of technology, people, and capital (19):

*No place in the world is more symbolic of the new technologies of the late twentieth century than Silicon Valley in California. Perhaps 80% of the production workers also belong to ethnic minorities; and the great majority were recent immigrants to the U.S., and are women. Here technical language may be English, but its workers are in the main Spanish speakers. Many of the staff are South and East Asian. . .Most of China's exports, especially in the electronic sector, come from foreign-funded and foreign-owned enterprises, rather than either state-owned or locally privately-owned ones. In any case, much of China's export is low-tech, supplying textiles, toys and all sorts of other cheap goods to the world.*

In today's interconnected world, there is free trade in goods and services, and shared technology development among cooperating nations. Foreign companies are encouraged to set up operations in host nations that in turn will benefit from the high-paying jobs these companies create. The growth of the automotive industry in the southern U.S. is an excellent example of techno-globalism in operation. Note that under this model, innovation is no longer the domain of the government (i.e., Japan, Inc.). Instead, it is spearheaded by private companies, multi-national corporations (MNCs), and venture capitalist—in short, by global market forces.

While good in theory, both of these philosophies have severe limitations. A critical failure of techno-nationalism is the removal of moral hazard. One has to look no further than Japan in the 1990s, as its maintenance of zombie companies deeply compounded a severe deflationary period that lasted well over a decade. Indeed, the Japanese now refer to this as the Lost Decade – there simply was no economic growth during this period. On the other hand, the free exchange of technology and capital associated with techno-globalism thrives during economic booms. But when times are hard and fear of foreign competition intensifies, nations tend to retreat and techno-nationalist sentiments grow. The "Buy American" clause in early versions of the American Recovery and Reinvestment Tax Act of 2009 is a perfect example of this fear in action. Critics of this approach point to the Smoot Hartley Act passed by the U.S. Congress in 1931. This bill penalized imports into America and set off a worldwide round of tariff increases, making a dire economic situation much worse and, many argue, creating the conditions for the Depression.

**The Hybrid Model:** We are now seeing the rise of a third approach, the techno-hybrid or **neo-techno-nationalism**. This philosophy combines globalization with home grown (local) technology. Typically this means governments do four things (18):

- Expand state commitments to promote technical innovation domestically;
- Rely more on the private initiative and the public-private partnerships;
- Demonstrate greater openness toward foreign R&D entities; and
- Make more commitments for international rule-making and policy coordination.

The second point—public-private partnerships—is especially important. Basic/pure research is the source of much innovation and is critical for our national and economic security. The Federal government is the largest supporter of basic research, accounting for 61% of the total investment. The private sector, on the other hand, devotes about 4% of its R&D dollars to basic research and accounts for about 16% of the nation's total investment in pure research. These dollars appear to be well-spent, for as much as half of post-World War II economic growth is due to R&D-fueled technology progress (21).

In compliance with the 2003 President's Manufacturing Initiative, the government created the Interagency Working Group (IWG) on Manufacturing Research and Development. The IWG has identified three areas where the Federal government can play a role in positively impacting U.S. manufacturing and the nation's economy. These are (21):

1. Manufacturing R&D for hydrogen technologies – reliable manufacture of hydrogen production, storage solutions, and fuel components and systems
2. Nanomanufacturing – mass production of reliable, affordable nanoscale materials, structures, devices and systems including the integration of ultra-miniaturized top-down processes and evolving bottom-up or self-assembly processes
3. Intelligent and integrated manufacturing – application of advanced software, sensors, networks, and other informational technologies to achieve rapid, cost-predictive development of innovative products and processes and highly efficient production machines and systems that can be easily adapted and reconfigured in response to changing requirements and new opportunities.

These kinds of public-private partnerships can surely have clear benefits. However, two points must be made. One, the hybrid approach supports broad R&D investment sectors. This is quite different from the Japan Inc. model that identified specific industrial “winners.” Two, the success of these partnerships requires cooperation with and acceptance of foreign R&D entities. One consequence of the current economic tsunami is the budding return to economic isolationism, something we’ll talk about later in this paper.

## So What Are Our Options?

Before answering this question, we have to recognize and accept certain realities. First, the current credit crisis has not only brought the Federal government deeper into the economic system than ever before, but it also means the government will stay deeply involved for at least the foreseeable future. While it will be years (at least) before we know if this involvement is good or bad, it is difficult to argue that it will be minimal. Only time will tell.

Second, globalization and international trade may now be slow, but they are not going away. For example, the Baltic Dry Index, a measure of shipping costs for commodities, has fallen almost 75% since May 2008. Yet even in the midst of the current crisis, there are signs that China is restocking steel ore inventories due to the underlying strength of its economy and the \$586 billion stimulus package announced by the government in November of last year (22). Also, while commodity futures are very weak, they have somewhat stabilized and have rebounded off the lows reached in November 2008 (23). Moreover, the extremely rapid growth of middle classes in India and China will undoubtedly continue to lead to consumer demands that cannot be met by domestic companies.

Third, the increased use of offshore companies for R&D by multinational corporations has led to a diffusion of their technology advantage. China, for example, has embraced technology development. That country is leveraging its market size and large highly-trained pool of scientists and engineers (about 1.2 million in 2006<sup>2</sup>) to promote its own technical standards in the interests of national security and economic advantage for its domestic industries. Moreover, in 2006 there were 370 Chinese technology companies with annual revenues of 1 billion renminbi or more. This is three times as many as in 2001 (24). India has a number of world-renowned high technology companies. The city of Bangalore is known as the Silicon Valley of India because of its preeminent position as the nation’s leading IT employer. South Korea also sees itself as one of the next science/technology superpowers. All three of these countries have and are continuing to increase their R&D spending; have massive available talents; have MNCs with R&D centers; have more patents and scientific publications, etc. (25) (26). It is clear that innovations have gone global and are no longer restricted by location.

Taken together, these three realities mean the world will remain an extremely competitive place and that government involvement (to some yet undetermined extent) in the innovation process will be required.

---

<sup>2</sup> Ministry of Science and Technology of the People’s Republic of China, China Science & Technology Statistics: Data Book, 2007 at <http://www.most.gov.cn/eng/statistics/2007/200801/P020080109573867344872.pdf>.

However, ultimately it will be entrepreneurs and small businesses that lead the development of innovative processes, services, and business models.

### ***Entrepreneurs***

People who start their own companies—and who make them successes—are the “McGyver’s” of the business world. Indeed, it is their resourcefulness that in all likelihood will prove to be the deciding factor in the global race for innovation and technological superiority. Consider the words of Amar Bhide of Columbia University Business School:

*Even if China spends a fortune to train more scientists, it cannot prevent America from capitalizing on their inventions with better business models (27) (28). The extraordinary willingness of its [U.S.] consumers to try new things—“venturesome consumption”—is a vital counterpart to the country’s entrepreneurial business culture (29). Even if China and India really are surging ahead in the number of technical graduates (and research by Vivek Wadhwa of Harvard University casts doubt on the quality of many of those degrees<sup>3</sup>), innovation is not a zero-sum game. On the contrary, there is growing evidence that the rise of the giant emerging economies may even help those companies from the rich world that take a global approach to innovation. Being global and open is now necessary for innovation. Cost is only one reason to have a global research presence. Another advantage is the ability to tap into pools of talent abroad. But the most important advantage is the ability to listen to, and learn from, customers in new markets (28).*

Bhide is not downplaying the role of R&D or the importance of well-trained scientists and engineers. He is merely emphasizing the unequivocal role of entrepreneurs. The downstream contributions—all the efforts and initiatives of putting innovation into use—are what define entrepreneurs as great innovators. Moreover, Bhide points out that most entrepreneurs, even those who build high-growth companies, tend to be more naturally focused on sales and marketing because they cannot afford the luxury of R&D. And they are particularly good at taking inventions or innovations developed by someone else and putting them into use (30).

Brian Headd, Economist for the Office of Advocacy, makes a similar point. He says that “entrepreneurship is the link between inventors, innovation, and economic growth. It’s not enough to just focus economic development on inventors and innovation. Entrepreneurs need to be cultivated as well, so that innovations can be turned into jobs and economic growth (31).”

There is no better example illustrating Bhide’s and Headd’s arguments than Bill Gates of Microsoft fame. Granted, Bill Gates is a genius, but he is more of an innovator than an inventor. In 1980, IBM approached Microsoft in search of an operating system for its upcoming IBM PC. Gates referred them to Digital Research, makers of the widely used CP/M operating system. IBM, however, was not able to reach a licensing agreement with Digital Research. A few weeks later Gates proposed using 86-DOS (QDOS), an operating system similar to CP/M, developed by Seattle Computer Products (SCP). Microsoft made a deal with SCP to become the exclusive licensing agent, and later the full owner, of 86-DOS. After adapting the operating system for the PC, Microsoft delivered it to IBM as PC-DOS in exchange for a one-time fee of \$50,000. Gates insisted that IBM let Microsoft keep the copyright on the operating system, because he believed that other hardware vendors would clone IBM’s system. They did, and the sales of MS-DOS made Microsoft a major player in the industry (32). The rest, as they famously say, is history.

Thus, it is vital that we as a nation do even more to promote the growth and development of entrepreneurs. While funding pure research will be critical to our long term success, we must also assist in the creation of those entrepreneurs who will be the crucial link between technological innovation and

---

<sup>3</sup> Additionally, research from Duke University suggests China graduates only half of the 600,000 engineers that government claims to produce annually.

commercial success<sup>4</sup>. A recent world-wide study by the Monitor Group identified attitudes and critical policies required for entrepreneurship to thrive. Some of their findings, and hence guidelines for us to consider, are:

- While venture capital is critical for the growth of new businesses, it is seed capital that ultimately determines whether these entities are formed in the first place.
- Lowering income taxes, increasing deductions for entrepreneurship and providing the right incentives for the commercialization of research and development are likely to have a much greater impact on business creation than are incubators or simplifying administrative and regulatory processes.
- The teaching of entrepreneurial skills at all education levels, from elementary school through university, has a significant impact on levels of entrepreneurship throughout the world (33).

But there is another point that should be added to this list. It is vital that we do not retreat – or at least try to retreat – behind trade and legal barriers that try to keep out new technologies. The Organization for Economic Co-operation and Development (OECD) recently released a report showing strong growth in the share of patent applications owned or co-owned by applicants whose country of residence is different from that of the inventor (34). In fact, the U.S. leads the world in the number of patents owned domestically for inventions that were made abroad: we possess 28% of the world’s total (35). One significant reason for this trend is the need to adapt products and processes to host markets. And here is where entrepreneurs can excel – identifying how these technologies and products can be made to fit the wants and needs of their customers. Indeed, even in technological industries, commercial and economic success depends largely on how that technology meets the needs of its customers, not on the quality of the technology (36).

### ***Existing Small Businesses***

In addition to encouraging the creation of new entities, we must also support and protect existing ones, especially small businesses. Terry Neece of the National Center for Public Policy notes that eight years ago, small businesses bailed us out of the 2001 recession, *generating 100% of all new jobs and jumpstarting the recovery* (37). Moreover, the Small Business Administration’s Office of Advocacy latest employment figures clearly show that almost all the states have about 50% of jobs belonging to small business (Table 2) (38).

<b>State</b>	<b>% Share</b>	<b>State</b>	<b>% Share</b>	<b>State</b>	<b>% Share</b>
Alabama	49.70%	Kentucky	50.00%	North Dakota	63.30%
Alaska	55.60%	Louisiana	54.10%	Ohio	48.60%
Arizona	48.80%	Maine	60.60%	Oklahoma	54.00%
Arkansas	48.80%	Maryland	53.40%	Oregon	57.20%
California	52.10%	Massachusetts	48.30%	Pennsylvania	49.90%
Colorado	51.70%	Michigan	51.60%	Rhode Island	57.10%
Connecticut	49.60%	Minnesota	51.00%	South Carolina	50.00%
Delaware	48.30%	Mississippi	50.10%	South Dakota	63.20%
District of Columbia	48.20%	Missouri	49.70%	Tennessee	45.10%
Florida	44.00%	Montana	69.80%	Texas	46.80%

<sup>4</sup> Mississippi State University offers an excellent program entitled FastTrac for budding entrepreneurs. Interested readers are referred to Tom Adkins (Technology Resource Institute; 662.325.8122) or Amy Garrard (TRI/Franklin Furniture Institute; 662.325.8453)

Georgia	46.30%	Nebraska	51.40%	Utah	49.90%
Hawaii	56.10%	Nevada	44.20%	Vermont	63.50%
Idaho	58.60%	New Hampshire	54.90%	Virginia	49.40%
Illinois	49.20%	New Jersey	51.10%	Washington	55.70%
Indiana	48.60%	New Mexico	57.00%	West Virginia	54.30%
Iowa	51.60%	New York	51.70%	Wisconsin	53.40%
Kansas	54.60%	North Carolina	48.60%	Wyoming	66.20%

Source: **McDowell, John**. CORRECTED: Economic Recovery Depends on Small Business. *U.S. Small Business Administration Office of Advocacy*. January 26, 2009. <http://www.sba.gov/advo/press/09-02rev.html>.

Not only does small business supply a huge number of existing jobs, but it also accounts for the vast majority of new jobs. According to the SBA's Office of Advocacy, small businesses created 78.9% of the nation's net jobs from 2004 to 2005 (39).

Once the current crisis is passed, job creation undoubtedly will once again fall to the purview of small business. But for jobs to be created, we must provide these businesses with things such as a lessening in the regulatory burden and tax credits for job creation. Perhaps the most immediate help for small business must come in the form of credit. These days, small business owners who lack adequate credit histories or have not yet established any credit history simply cannot gain access to credit at all. Not only that, but many well-established, profitable companies with excellent, long-term credit histories have found their credit lines reduced considerably and, in some cases, cut off entirely (40).

Small business owners also must take steps to prepare for the return of more normal business conditions. For instance, even though small, each business should know where its strategic advantage lies and what are its core strengths. Even in these difficult times, small business must recognize the point at which belt tightening become muscle cutting. Moreover, the savvy business owner must recognize that when competitors cut back, this provides an opportunity to improve market share and increase name recognition. There are few better times to advertise your business than in an economic downturn.

Finally, small business owners must realize they are far more innovative than many realize. There's a tendency for sole proprietors to think that only large companies with formal R&D departments can be innovative. This is very far from the truth. A key advantage for many small companies is that they have very close connections to their customers. This allows them not only to better understand their needs, but can also put them in position to use a customer's problem as an opportunity to sell that customer another solution. Small businesses are responsive, iterative and flexible (41). When external conditions change, the company of 10 employees will be able to experiment with a new business model while a company of 10,000 can only sit back and watch.

Moreover, resource constraints often lead to innovative solutions. Big companies often have the "luxury" of too much time, money, and people to be innovative. When there is money to throw at a problem, there is less incentive to be truly innovative. Moreover, having too many people involved can lead to bureaucratic gridlock. Without a sense of urgency, there is far less motivation to be innovative. And if it's one thing small business owners are familiar with, it is this sense of urgency.

### ***The Nation as a Whole***

Undoubtedly the list of things we as a country could and should do to foster innovation would run for pages and pages. But perhaps the most immediate thing we should do is to resist the urge to become Fortress America. Many see globalization as a major cause of the current economic situation, and there are daily calls for this movement to end. But as we showed earlier in this paper, there is a strong growing trend of cross-border innovation. It is becoming more and more common for inventors and patent owners to reside in different countries. This should be a boon to our economy, given the innovativeness of our

entrepreneurs and the values of our country. This kind of exchange is just as much a part of globalization as is the transfer of physical products from one country to another.

Indeed, it can be argued that in all of the difficult times we've been through, the U.S. has weathered them because of its uniqueness among nations in terms of the openness of its economy, society and politics. And it is this openness and our tradition of welcoming and pursuing innovation that constantly draws foreign-born inventors, scientists, and entrepreneurs to these shores. It is this welcoming attitude that brings so many Chinese and Indian entrepreneurs to America even as mundane jobs are outsourced to China and India. These are some of the factors that distinguish the U.S. from other countries. It is these same factors that make the country less likely to fail compared to other nations. And these are traits and characteristics we cannot afford to lose, much less throw away.

## Conclusion

The global economic slowdown is another in a long line of "structural breaks" our economy and nation have faced and survived. As we pointed out in the beginning of this paper, many of these breaks have seen the birth of the greatest companies our country has ever known. This has not been due to chance or happenstance. The companies that arose from economic ashes have been innovative – in either their product or service, or their business model. Each of the entrepreneurs who created these companies realized that doing more of the same was a guarantee of failure.

The U.S. not only has innovative technologists, but also innovative manufacturers, retailers, and customers. It is this innovativeness that ultimately will get us through the present crisis, and plant the seeds for tomorrow's business and societal successes. Of this there should be little doubt.

**Business Outreach welcomes comments by e-mail sent to [bizservices@cobilan.msstate.edu](mailto:bizservices@cobilan.msstate.edu).**

## REFERENCES

1. **Subramanian, K. (Subbu)**. Reflections on the Future of Manufacturing in Central Massachusetts. *The Manufacturing Advancement Center*. [Online] November 2008. [Cited: December 1, 2008.] <http://www.massmac.org/newsline/0811/article02.htm>.
2. Travel & History: Panic of 1837. *Oregon Coast Magazine Online*. [Online] [Cited: February 5, 2009.] <http://www.u-s-history.com/pages/h967.html>.
3. Travel & History: Panic of 1873. *NWtravel Magazine Online*. [Online] [Cited: February 6, 2009.] <http://www.u-s-history.com/pages/h213.html>.
4. Travel & History: Panic of 1907. *Oregon Coast Magazine Online*. [Online] [Cited: February 6, 2009.] <http://www.u-s-history.com/pages/h952.html>.
5. Travel & History: The Great Depression. *NWtravel Magazine Online*. [Online] [Cited: February 6, 2009.] <http://www.u-s-history.com/pages/h1569.html>.
6. Late 1950's Recession. *Recession.org*. [Online] [Cited: February 16, 2009.] <http://recession.org/history/late-1950s-recession>.
7. Recession of 1958. *Wikipedia*. [Online] January 21, 2009. [Cited: February 23, 2009.] [http://en.wikipedia.org/wiki/Recession\\_of\\_1958](http://en.wikipedia.org/wiki/Recession_of_1958).
8. Recession in Detroit. *Time*. [Online] April 14, 1958. [Cited: February 23, 2009.] <http://www.time.com/time/magazine/article/0,9171,864235,00.html>.

9. Chevrolet Impala. *Wikipedia*. [Online] February 16, 2009. [Cited: February 23, 2009.] [http://en.wikipedia.org/wiki/Chevrolet\\_Impala](http://en.wikipedia.org/wiki/Chevrolet_Impala).
10. Monthly Energy Review. *Official Energy Statistics from the U.S. Government*. [Online] January 2009. [Cited: February 6, 2009 February.] [http://www.eia.doe.gov/emeu/mer/pdf/pages/sec9\\_6.pdf](http://www.eia.doe.gov/emeu/mer/pdf/pages/sec9_6.pdf).
11. FedEx History. *FedEx*. [Online] 2009. [Cited: February 6, 2009.] [http://about.fedex.designcdt.com/our\\_company/company\\_information/fedex\\_history](http://about.fedex.designcdt.com/our_company/company_information/fedex_history).
12. Microsoft. *Wikipedia*. [Online] [Cited: February 12, 2009.] <http://en.wikipedia.org/wiki/Microsoft>.
13. Early 1980s Recession. *Wikipedia*. [Online] [Cited: February 16, 2009.] [http://en.wikipedia.org/wiki/Early\\_1980s\\_recession](http://en.wikipedia.org/wiki/Early_1980s_recession).
14. Music Television. *The Museum of Broadcast Communications*. [Online] [Cited: February 23, 2009.] <http://www.museum.tv/archives/etv/M/htmlM/musictelevis/musictelevis.htm>.
15. CNN. *The New Georgia Encyclopedia*. [Online] January 16, 2004. [Cited: 23 2009, February.] <http://www.georgiaencyclopedia.org/nge/Article.jsp?id=h-2643>.
16. **Hanas, Jim**. A brief History of Silver Linings. *Creativity Online*. [Online] February 11, 2009. [Cited: February 16, 2009.] <http://creativity-online.com/?action=news:article&newsId=134565&sectionId=feature>.
17. Early 2000's Recession. *Recession.org*. [Online] [Cited: February 17, 2009.] <http://recession.org/history/early-2000s-recession>.
18. **Yamada, Atsushi**. Neo-Techno-Nationalism: How and Why It Grows. *The Japan Center for Area Studies*. [Online] 2000. [Cited: January 9, 2009.] <http://www.cias.kyoto-u.ac.jp/jcas/nc/yamada.pdf>.
19. **Edgerton, David E.H.** The Contradiction of Techno-Nationalism and Techno-Globalism: A Historical Perspective. *New Global Studies*. [Online] 2007. [Cited: January 9, 2009.] <http://csde.washington.edu/~scurran/files/readings/SIS511/EdgertonNewGlobalStudies.pdf>.
20. **Hollings, Ernest and Charles McMillion**. China Threatens America's Lead In Technology. *Financial Times*. [Online] January 14, 2007. [Cited: August 14, 2008.] [http://www.ft.com/cms/s/0/b355aaee-a40e-11db-bec4-0000779e2340.html?nclick\\_check=1](http://www.ft.com/cms/s/0/b355aaee-a40e-11db-bec4-0000779e2340.html?nclick_check=1).
21. **Interagency Working Group on Manufacturing R&D, Committe on Technology and National Science and Technology Council**. Manufacturing the Future. *Manufacturing.gov*. [Online] March 2008. [Cited: December 2, 2008.] [www.manufacturing.gov/pdf/NSTCIWGMFGRD\\_March2008\\_Report.pdf](http://www.manufacturing.gov/pdf/NSTCIWGMFGRD_March2008_Report.pdf).
22. **Holloway, Alistair and Nightingale, Alaric**. Commodity Shipping Index Advances the Most Since at Least 1985 . *Bloomberg.com*. [Online] Bloomberg L.P., February 4, 2009. [Cited: February 7, 2009.] <http://www.bloomberg.com/apps/news?pid=20601102&sid=aiE9Cavy3HzY&refer=uk>.
23. Commodity Futures. *Bloomberg.com*. [Online] Bloomberg L.P., February 7, 2009. [Cited: February 8, 2009.] <http://www.bloomberg.com/markets/commodities/cfutures.html>.
24. **Albrecht, Stefan, Beyer von Morgenstern, Ingo and Xia, Xiaoyu**. China's High-Tech Companies Go Global. *Forbes.com*. [Online] July 8, 2008. [Cited: February 8, 2009.] [http://www.forbes.com/2008/07/08/china-high-tech-lead-cx\\_saimxx\\_0708mckinsey.html](http://www.forbes.com/2008/07/08/china-high-tech-lead-cx_saimxx_0708mckinsey.html).
25. The New World Of Innovation. *Emerald Group PUBLISHING Strategic Direction Journal*. [Online] 2007. [Cited: January 9, 2009.] [www.emeraldinsight.com/10.1108/02580540710779762](http://www.emeraldinsight.com/10.1108/02580540710779762).
26. **OECD**. OECD Science, Technology and Industry Outlook 2008 Highlights. *Organization for Economic Co-operatin and Development (OECD)*. [Online] 2008. [Cited: January 8, 2009.] <http://www.oecd.org/dataoecd/18/32/41551978.pdf>.

27. **Swanson, Bret.** “Techno-Nationalism”: Debating the “Where” of Innovation. *The Technology Liberation Front*. [Online] December 1, 2008. [Cited: December 3, 2008.] <http://techliberation.com/2008/12/01/techno-nationalism-debating-the-where-of-innovation/>.
28. **The Economist.** A Gathering Storm? *Economist*. [Online] November 20, 2008. [Cited: December 3, 2008.] [http://www.economist.com/business/displaystory.cfm?story\\_id=12637160](http://www.economist.com/business/displaystory.cfm?story_id=12637160).
29. **Bhide, Amar.** Venturesome Consumption, Innovation and Globalization. *Amar Bhide*. [Online] July 21-22, 2006. [Cited: January 9, 2009.] [http://www.bhide.net/bhide\\_venturesome\\_consumption.pdf](http://www.bhide.net/bhide_venturesome_consumption.pdf).
30. **Schine, Eric.** Q: Is the U.S. Losing Its Economic Edge? *Inc.com*. [Online] November 2008. [Cited: December 3, 2008.] <http://www.inc.com/magazine/20081101/q-is-the-us-losing-its-economic-edge.html>.
31. Entrepreneurship Vital For Regional Growth. *Office of Advocacy*. [Online] April 19, 2005. [Cited: February 8, 2009.] <http://www.sba.gov/advo/press/05-18.html>.
32. Bill Gates. *Wikipedia, the free encyclopedia*. [Online] February 7, 2009. [Cited: February 9, 2009.] [http://en.wikipedia.org/wiki/Bill\\_Gates](http://en.wikipedia.org/wiki/Bill_Gates).
33. Economic Crisis Breeds Opportunities for Entrepreneurship. *Business Wire*. [Online] January 15, 2009. [Cited: February 10, 2009.] [http://www.businesswire.com/portal/site/home/permalink/?ndmViewId=news\\_view&newsId=20090115005116&newsLang=en](http://www.businesswire.com/portal/site/home/permalink/?ndmViewId=news_view&newsId=20090115005116&newsLang=en).
34. **Organisation for Economic Co-Operation and Development.** *OECD Science, Technology and Industry Scoreboard 2007*. 2007. ISBN 978-64-03788-5.
35. —. Dataset: Indicators of international co-operation. *OECD.StatsExtracts*. [Online] 2008. [Cited: February 9, 2009.] <http://stats.oecd.org/WBOS/Index.aspx?DatasetCode=CSP2008>.
36. **Kay, John.** The East’s Innovators Are No Threat To The West. *Financial Times*. [Online] December 2, 2008. [Cited: December 3, 2008.] <http://www.ft.com/cms/s/0/b7fa53b0-c095-11dd-9559-000077b07658.html>.
37. **Neece, Terry.** What Will The Obama Administration Do For Small Business? *Terry Neece's Blog*. [Online] January 6, 2009. [Cited: January 26, 2009.] <http://terry-neece-blog.com/>.
38. **McDowell, John.** CORRECTED: Economic Recovery Depends on Small Business. *U.S. Small Business Administration Office of Advocacy*. [Online] January 26, 2009. [Cited: January 27, 2009.] <http://www.sba.gov/advo/press/09-02rev.html>.
39. **SBA Office of Advocacy.** *Small Business Profile*. Washington, DC. : U.S. Small Business Administration, 2008.
40. **Sildon, Steve.** Tips for small business owners struggling amidst the credit crisis. *Credit Writedowns*. [Online] January 22, 2009. [Cited: February 9, 2009.] <http://www.creditwritedowns.com/2009/01/tips-for-small-business-owners-struggling-amidst-the-credit-crisis.html>.
41. **Waldeck, Andrew and Callahan, Renee H.** Innovation Lessons From Small Business. *Forbes.com*. [Online] February 3, 2009. [Cited: February 9, 2009.] [http://www.forbes.com/2009/02/03/apple-innovation-customers-leadership-clayton-christensen\\_0203\\_small\\_business.html](http://www.forbes.com/2009/02/03/apple-innovation-customers-leadership-clayton-christensen_0203_small_business.html).
42. **Suttmeier, Richard P. and Yao Xiangkui.** China’s Post-WTO Technology Policy: Standards, Software, and the Changing Nature of Techno-Nationalism. *The National Bureau of Asian Research*. [Online] May 2004. [Cited: January 23, 2009.] <http://www.nbr.org/publications/specialreport/pdf/sr7.pdf>.