

# Schumpeter's Children

*Even when big business was incontestably king, entrepreneurial forces drove the American economy and powered its periodic renewals. Today, there are worrisome signs that the game is up.*

BY MARGARET B. W. GRAHAM

A RIP VAN WINKLE AWAKENED TODAY FROM A 35-year slumber would be amazed to see such exemplars of “creative destruction” as Bill Gates and Steve Jobs lionized as popular heroes and corporate leaders. A generation ago, entrepreneurs were marginal, faintly disreputable figures and the corporation was a comfortingly solid if boring institution run by sober industrial statesmen. For most of the 20th century, the large corporations they ran—including such emblematic behemoths as General Motors and AT&T—dominated the U.S. economy, providing the slow but steady technical innovation and the reliable if not exciting returns that ensured the nation’s economic progress, until they faltered and downsized toward the end of the century.

That, at least, is the popular view. In this telling, the emergence of Gates, Jobs, and legions of other innovating entrepreneurs was a sudden, almost heaven-sent eruption

MARGARET B. W. GRAHAM is a professor at the Desautels Faculty of Management, McGill University, Montreal, and a founding director of Winthrop Group Inc., a professional firm of archivists and historians. An extended treatment of many of the ideas presented here can be found in her essay “Entrepreneurship in the United States, 1920–2000,” in *The Invention of Enterprise: Entrepreneurship From Mesopotamia to Modern Times*, edited by David S. Landes, Joel Mokyr, and William J. Baumol, published by Princeton University Press.

of creativity that came just in time to save a stagnating U.S. economy from ruin. The more complex reality is that while large corporations did increasingly dominate the economy after the turn of the 20th century, beneath the surface there was a complex and evolving set of relationships among big corporations, enterprising individuals, and smaller firms. The corporation itself became entrepreneurial. These “hidden” relationships have provided the American economy with its special capacity for renewal—its entrepreneurial edge—distinguishing it from those of many other developed nations, with their government-blessed national champions or zaibatsu-like groupings of companies and banks.

The emergence of the entrepreneur-hero in the late 1970s was less a radical break with this history than another turn of the wheel. A decade into the new century, the wheel is still turning, propelled by several underlying forces that shape the potential for entrepreneurship: access to capital through financial innovation, the patent system, intellectual property law, research and development, and antitrust policy. But in none of these areas can recent developments be called favorable. Financial innovation, which supplies new ways to raise precious capital,

is the essential ingredient in nurturing entrepreneurship, but today most of the energy in finance is pouring into the creation of instruments designed chiefly to enrich the intermediaries. Increasing amounts of investment capital are flowing into these and other high-yield investment vehicles. Foreign markets are also attracting more capital. Even venture capitalists are struggling. We may have seen the end of the entrepreneur-hero for at least a generation, and no revival of the innovative large corporation of the mid-20th century is in sight. America is in danger of losing its entrepreneurial edge.

**N**ever in American history have entrepreneurs enjoyed greater prestige than during the period that culminated in the second industrial revolution of the late 19th century, when railroads, steel, electricity, chemicals, and other businesses grew into vast national enterprises, and iconoclastic figures such as Thomas Edison and Henry Ford amassed great fortunes by bringing remarkable new products to the American public. By World War I, however, this revolution had already entered a phase of consolidation, and the war effort only strengthened the new emphasis on the systematic application of scientific management and increased coordination between government and the corporate world.

There was still room in the 1920s for the celebrity tycoon and the upstart business enterprise, but the envi-



**Iconoclasts such as Apple's Steve Jobs have defined the modern entrepreneurial era, but new and daunting obstacles stand in the way of the generation that is striving to succeed them.**

ronment was changing. The railroads and other free-wheeling enterprises of the earlier era were renowned breeders of political corruption, and the glittering wealth of the moneyed classes glared ever more harshly in con-

trast to the hardships of the nation's farmers and urban poor. In this atmosphere, large centralized corporations headed by industrial statesmen such as Owen D. Young, chairman of General Electric from 1922 to 1939, increasingly took center stage. Unlike the entrepreneurs of the past, the typical new corporate leader was an establishment figure, often college educated, always socially and politically well connected. The term *entrepreneur* took

tunities for new enterprises of all sizes. Suburbanization, rising incomes, and increased leisure time created new consumer markets for big-ticket items. Buying was made easier by low interest rates and, toward the end of the decade, the widespread availability of installment plans for purchases of furniture, cars, and other consumer durables. In Hollywood and beyond the new entertainment industries boomed, encouraging movie

entrepreneurs such as Mary Pickford and Mae West. Rising automobile ownership increased Americans' mobility and their sense of personal freedom.

The iconic growth business was wireless radio, a science-based industry that crossed over from the military to the consumer market.

During World War I the federal government assumed control of the wireless industry for military purposes, placing American Marconi under GE. Then, in 1919, at the behest of the U.S. Navy, the Radio Corporation of America (RCA) was endowed with near-monopoly control of radio patents and spun out from GE as a private company. In the decade after Pittsburgh's KDKA took to the air with the nation's first commercial broadcast in 1920, the number of households with radios climbed to 14 million, creating opportunities for entrepreneurs in every field from the design and production of radio sets to advertising and enhanced retailing.

The pace of change—a popular book of 1927 called it “the new American tempo”—was frenetic, forcing even the most established firms to develop nerve endings more attuned to the public's shifting tastes. Even Ford Motor Company was forced to react, finally replacing the Model T it had promoted as durable and changeless—available in any color a customer wanted “so long as it is black,” as Henry Ford famously declared—with the newly redesigned Model A to better compete with GM's varied offerings. A new symbiosis developed between large and small enterprises, with bigger firms striving to return to settled patterns as quickly as possible while smaller ones rushed to introduce fresh product lines and businesses and to find new ways to mediate the

**THE CHALLENGE FOR entrepreneurs in the 1930s was to anticipate science-based inventions and use them to shape the path of technological change for profit.**

on a negative connotation, signifying the eccentric individual who was all too likely to be disruptive to the well-integrated organizational system. For decades, that connotation would stick. A whole generation would pass before baby boomers and their children would forget the appeal of job security and embrace the excitement of risk taking, along with the higher returns associated with financial insecurity.

Beneath the shallows of public opinion, however, fundamental forces were remaking the entrepreneurial role. As economist Joseph Schumpeter (who gave currency to the phrase “creative destruction”) observed in the 1930s, individual entrepreneurs in the past had mainly sought business opportunities by exploiting particular inventions that came to them or the changes they stimulated; now the challenge was to anticipate science-based inventions, combine them, and use them to shape the path of technological change for profit. *Innovation* had become the essential entrepreneurial act. And Schumpeter saw in the emergence of innovation-oriented corporations such as the Aluminum Company of America (Alcoa) and a new breed of corporate managers such as Alfred P. Sloan of GM that, increasingly, entrepreneurship would be the business of large organizations.

Still, the Roaring Twenties offered abundant oppor-

relationship between large firms and their customers. Auto companies benefited from the rise of independent dealer networks and garages; radios were sold and repaired by independent dealers and repair shops; huge national department store chains found their voices through advertising firms such as J. Walter Thompson that specialized in new forms of market research.

On Wall Street, financial innovation opened doors for many companies, fostering growth in emerging industries such as aviation and radio along with mergers and consolidation in more established fields. The rise of more sophisticated capital markets was a boon to both lone entrepreneurs and their corporate counterparts, freeing the former from the need to raise money on their own and providing large companies with the wherewithal to gobble their competitors. According to one study, the 1920s saw more new stock issues than any other period in the century. Mutual funds were another important financial innovation of the decade. They made it possible for a whole new set of investors to contribute to pools of available capital while enjoying the benefits of diversified portfolios at affordable prices.

All of this, of course, changed after 1929. With the onset of the Great Depression, Washington stepped in to coordinate and fund major pieces of the economy in order to combat joblessness, restore economic stability, and, later, mobilize industry for war. The Depression reduced the chances of survival for start-up firms and killed off many existing ones.

For large companies that survived, however, the 1930s offered a chance for a technology-enhanced form of corporate entrepreneurship. Freed from the overheated demands of the Roaring Twenties' carnival marketplace, they were able to pursue long-term business opportunities built on a foundation of organized invention: BF Goodrich investigated artificial rubber; RCA strove to achieve a working television system; DuPont pushed ahead with nylon and other artificial fibers. With the advent of science- and capital-intensive technologies, such as sound and later Technicolor in films, the freewheeling days were over. Practical entrepreneurs found themselves shut out of this more corporatized economy, and the door would remain closed for 50 years.

At the heart of the more consolidated corporate entrepreneurship was the corporate research labora-

tory. Only a handful of pioneering research laboratories had existed before World War I, but more than 500 firms set up such institutions in the decade after it. DuPont, Alcoa, Kodak, GM, RCA, and many other companies turned to research and development (R&D) for new product ideas and ways to execute them. Their corporate godfathers had high hopes. If the modern corporation was going to succeed on the basis of efficiency, rationality, and orderly technical innovation, then what better institution to put at its center than the well-managed laboratory, stocked with degree-bearing engineers and scientists? In many cases the laboratory was to act as the company's standard-setter and the arbiter between different divisions of the corporation formerly controlled by stubborn and unruly craftsmen. It also tied the corporation to other laboratories, university-based researchers, scientific societies, and government agencies such as the National Bureau of Standards and the Patent Office. The day when amateurs and basement tinkerers could play a developmental role in high-growth industries seemed clearly in the past.

**T**hat wisdom was confirmed by America's experience in World War II. With Washington as maestro, the nation rapidly produced vast quantities of K rations, B-29 bombers, and everything in between, while researchers marshaled by the government from industry and the universities designed and built the atomic bomb and made rapid technological strides in fields such as radio and radar.

For American policymakers, the war offered a powerful example of what the economy could accomplish if directed and optimized by the federal government, and they believed they could most efficiently accomplish their goals through large corporate entities. At the heart of the shift was the Cold War agenda of exploiting designated technologies to maintain and improve the nation's defenses—avionics, electronics, new materials, aeronautics. If there was room for smaller entrepreneurial companies in this grand design, it was chiefly as second- or third-tier contractors to now giant firms.

The wartime cooperation of administrative government, university, and private industry coalesced in the troubled peace of the Cold War decades under a decidedly military command-and-control model. Prewar cor-

porate laboratories had mainly focused on industrial and consumer products—artificial fibers, telephone systems, lighting, photography, and glassware. In the postwar era, a much-expanded portion was allocated to defense applications, with the Defense Department controlling the research agenda. Nonmilitary agencies of the federal government were also expanding, and the Social Security Administration, the Internal Revenue Service, and other agencies generated huge demand for data-processing systems. For most high-tech companies, government was a significant and lucrative part of their business.

A few areas remained open to freelance entrepreneurs, but even here the federal influence was strong. Residential construction was one such industry, but it was stimulated by government programs aimed at housing returning servicemen. Large developments such as New York's Levittown and California's Daly City were the norm. The new postwar domesticity, with mothers at home tending large families, created demand for mass entertainment, with opportunities in television advertising, production, and recording, as well as in retail television dealerships and repair services. For the most part, however, the economy revolved around large corporations, and entrepreneurship was the business of big organizations.

**I**t was, nevertheless, in this seemingly unpromising soil for smaller enterprise that the seeds of the post-1970s entrepreneurial era were sown. A big window of opportunity opened with the coming of computer technology, first known as the calculator. During World War II, several teams of inventors at different universities had developed analog versions of the “electromechanical calculator” designed to do the challenging computational tasks required to control modern weaponry. Few of the inventors recognized that the new devices might also have commercial applications. The exception was the team of electrical engineer J. Presper Eckert and physicist John W. Mauchly at the University of Pennsylvania, creators of the famous wartime ENIAC (Electronic Numerical Integrator and Computer), who saw that these machines could be used to automate the information-processing tasks facing large corporations and government bureaucracies.

The experience of the Eckert and Mauchly Computer Corporation demonstrates the difficulties that faced small entrepreneurs of all kinds, even high-tech entrepreneurs. Chief among them was financing. Needing vast and unpredictable amounts of money, early computer developers of all sizes took on a combination of military contracts and commercial orders to fund the initial development of their machines. Eckert and Mauchly could raise only shoestring financing, and that for a mere fraction of the development needed for the UNIVAC, the commercial version of their famous wartime creation. In 1950 the company was sold to Remington (later Sperry) Rand.

Much of the early innovation in computers was the work of large firms such as RCA, GE, and Sperry Rand. The company that ultimately dominated the computer industry during the 1950s and '60s, IBM, prevailed not because it was the inventor or even the technology leader, but because it offered an additional innovation, designing a managerial and technological support system that gave customers what they needed to make computer investments profitable. For decades, IBM's approach gave it a virtual monopoly, impenetrable by competitors and closed to outside suppliers.

In historical terms, however, Big Blue's reign was brief, and early stumbles pointed to the kinds of opportunities that would become more common for individuals of an independent inclination with the right expertise and a taste for risk. In 1962, H. Ross Perot, who was for several years IBM's leading salesman, left to set up a competing data-processing company, Electronic Data Systems, which subsequently made him a multibillionaire. Even as IBM dominated mainframe computers, partly through its spectacular success with the novel System/360, it stumbled against more nimble competitors such as Digital Equipment Corporation in the next-generation minicomputer market of the 1970s. In its haste to play catch-up after the debut of the Apple II personal computer in 1977, IBM outsourced the development of the operating system for its own PC to Harvard dropout Bill Gates and his partner Paul Allen at fledgling Microsoft. Simultaneously it handed the microchip design to Intel, only recently launched by Gordon Moore and other defectors as a spinoff from Fairchild Semiconductor. Both Microsoft and Intel soon grew bigger than Big Blue, which, like many other estab-



**John W. Mauchly tends to the ENIAC, one of the world's first working computers, which he and J. Presper Eckert built during World War II. The pair later blazed an information age pathway by launching their own computer company, which they were eventually obliged to sell to a larger firm.**

lished high-tech companies, subsequently went through a period of downsizing and restructuring before emerging as a technology and services company.

IBM was not alone in its travails. By the 1970s, successful innovation by large corporations had become more the exception than the rule. The postwar business system, with its foundation of guaranteed returns for companies based on cost-plus contracts in the defense sector, eventually encountered diminishing returns. Companies that controlled fundamental patents, such as the spectacularly successful corporate innovator Xerox, hid behind patent protection, while others found ways to turn regulations to their advantage. Lacking serious competition in a world of oligopolies and plush government contracts, high-tech companies seemed to show

that the rewards of corporate entrepreneurship could be had without the risks. Investors fell in love with this picture, but there was one problem: cyclicity. Profits could be “lumpy” in a system built on big contracts that expired and major products with limited life spans. Wall Street had a solution: the corporate conglomerate.

It was the conglomerate movement of the 1960s and '70s that effectively put an end to the entrepreneurship of large corporations. Technology-based companies that had suffered from volatile stock prices because of the uncertainties of innovation were seduced by investment banks into acquiring unrelated businesses with different risk characteristics. Owning a portfolio of countercyclical businesses would even out their returns, the bankers said.

As corporations such as Ling-Temco-Vought and ITT transformed themselves into conglomerates, they soon found that unrelated acquisitions with different management characteristics and capital requirements undercut their ability to carry out the steady product innovation they needed to renew their core businesses. In the 1960s even mighty RCA acquired a variety of unrelated firms, then stumbled badly in consumer electronics and other areas in the 1980s. RCA's tattered remnants were reabsorbed into GE. Other once reliable corporate entrepreneurs also faltered, including Eastman Kodak with its disc camera, AT&T with its picture phone, and Polaroid with its repeated attempts to innovate in electronic cameras.

Ironically, the corporate laboratory itself also began to undermine the entrepreneurial capacities of many larger firms. Government-funded research, with its onerous reporting requirements, fostered bureaucratization in the big labs. And the increasingly cumbersome Cold War control and security provisions attached to military R&D contracts sharply restricted the circulation of scientific knowledge. At the same time, corporate structural reforms originally designed to strengthen the labs by putting them on an equal footing with other divisions of the corporation had the opposite effect. Caught up in bureaucratic struggles for resources, laboratories tended to focus on patenting and licensing at the expense of innovation in order to put a hard dollar value on their contribution to the corporate weal. For many large technology-based companies, such as Texas Instruments and RCA, licensing revenues for proprietary technologies became more important than the innovations the technologies were supposed to support.

Eventually, these practices made formerly innovative corporations vulnerable to smaller and more creative competitors. At AT&T's fabled Bell Labs, researchers looking for ways to radically increase telecommunications bandwidth, for instance, proved no match for the smaller and more agile Corning Glass Works, which in 1984 supplied the fruits of its research to AT&T's mortal enemy, MCI Communications. The optical fiber revolution thus began some 20 years earlier than AT&T had planned. The smaller MCI, emboldened by the breakup of AT&T on antitrust grounds, used the new fiber optics to give AT&T the first serious competition it had faced.

Despite the generous pay and big budgets of corporate laboratories, many of the most brilliant inventors and scientists, especially those with entrepreneurial leanings, began

pursuing their ideas and aspirations in less comfortable surroundings. Most started out with financial help from friends, family, and others, and the successful ones eventually secured procurement contracts from larger enterprises. In cases that were rare at first, start-ups gained support from a new form of financing, venture capital. In Silicon Valley, more than a few garage shrines mark the spots where famous high-tech companies got their start. William Hewlett and David Packard, Steven Jobs and Steve Wozniak, Paul Allen and Bill Gates, along with less well known experimenters such as Ed Roberts, designer of the Altair computer kit, laid the groundwork for new high-tech enterprises in driveways, garages, and college dorm rooms.

These new inventor-entrepreneurs stepped into a world undergoing several extraordinarily helpful transformations. Some of these changes were the products of purposeful business decisions and government policy choices, but many arose from less predictable sources, not the least of which was the maturing of the baby boom generation. Having come of age resisting the war in Vietnam, boomers associated big business with destructive uses of technology, such as napalm, and rejected both its bureaucratic structure and the boring sameness of its products. From this countercultural generation would come a new kind of consumer—and a new kind of entrepreneur.

**T**he boomers were receptive to cheaper, foreign-made, and just plain different goods, from Volkswagen Beetles to Japanese-made transistor radios. Their skepticism about Cold War verities led to demands for reduced military budgets, and they rejected the excesses of military procurement symbolized by such urban legends as the Pentagon's infamous \$5,000 toilet seat. Baby boomers demanded cleaner air and water, consumer protection, product safety, and environmental controls. As the federal government shifted the focus of regulation to these areas, newly deregulated industries such as airlines, communications, and utilities attracted individual entrepreneurs, giving rise to major ventures such as MCI and Southwest Airlines.

Another transformational force came in the late 1970s, when the information revolution got a fortuitous second wind as it swept from institutional to consumer products. Independent software and peripherals, home computers, and computer games took the entire computer business

in such different directions that by the end of the century, many of the industry's early powers—GE, RCA, and AT&T—were out of the game altogether, leaving plentiful opportunities for newcomers. And a decade later, the end of the Cold War gave consumer industries a jolt of fresh energy when new technologies of extraordinary power were released from the government laboratories where they had been sequestered—database technologies, computer imaging for animation and gaming, supercomputers, satellite technologies, and spacecraft.

Other shifts in government policy also played a significant transformational role. The Bayh-Dole Act of 1980 released universities from the requirement that they cede control of discoveries made with federal funding to the government, unleashing a new generation of entrepreneurial researchers. More help

came from the patent system. For a variety of reasons, the number of patents filed in the United States had dropped dramatically in the 1960s and '70s. One cause was federal antitrust policies dating as far back as the New Deal, when federal regulators began targeting corporations that were hoarding and trading their own intellectual property while buying up and suppressing patents that threatened their control of technological change in their industry. The remedies won by antitrust lawyers often required companies such as AT&T and RCA to license patents to their competitors, and some corporations simply refrained from patenting, resorting to secrecy instead. In the early 1980s, however, rising foreign economic competition prompted a change in federal antitrust enforcement and a reform of the patent system. The patent downturn of the previous decades was reversed.

Yet even the remarkably favorable conditions of the 1970s and '80s would not likely have yielded the great flowering they did without one crucial element: access to new sources and forms of capital. A wave of financial innovation began in the 1970s, that notorious decade of “stagflation,” or slow growth and high inflation. A dearth of capital coupled with very high interest rates starved new ventures and hampered even established firms.

Michael Milken emerged in the early 1970s with a solution that would make him one of the most controversial entrepreneurs in Wall Street history. His employer, Drexel Burnham Lambert, was a minor player on Wall Street and willing to give something novel a try. Milken's innovation was to create a market for newly issued high-yield bonds, known as “junk” bonds. Now companies with low credit ratings and little hope of securing financing on the corporate bond market could find other investors hungry for riskier but higher-yielding invest-

**MICHAEL MILKEN'S innovation was to create a market for “junk bonds,” and that market gave birth to another innovation, the leveraged buyout.**

ments. Milken famously wound up in jail on securities and tax charges and Drexel was forced to shut its doors, but, after a short pause during the stock market crash of 1987, the junk bond market thrived.

That market gave birth to another innovation, the leveraged buyout, often masterminded by specialized firms such as Kolberg Kravits Roberts, in which borrowed money was used to take over companies, strip their assets, and conduct layoffs, with the streamlined firms then sold at eye-popping profits to other investors. The vast sums of money accumulated in private hands through this process in the 1980s and early '90s provided pools of capital that could be used to finance new enterprises. Many large bureaucratic companies—some lethargic, others just unlucky—either disappeared or were downsized and reorganized, releasing expertise and other resources to be picked up by more entrepreneurial leaders of high-growth companies.

Venture capital supplied yet another powerful financial force. Banks and wealthy individuals had always invested in business start-ups, but their resources and taste for risk were limited. Between 1968 and 1975 as many as 30 venture capital firms formed or reformed in Silicon Valley, just in time for the semiconductor revo-





In the 1970s, Michael Milken created the “junk” bond market that financed many entrepreneurial ventures, but he later ran afoul of the law. He is shown here leaving a New York City court in 1989.

lution and the shift from transistors to integrated circuits. With hugely successful deals such as the launch of Intel (which went public in 1971), venture capital established itself as an important power. The industry also got significant boosts from a reduction in the federal capital gains tax in 1978 and a 1979 federal law that declared it “prudent” for pension funds to devote a portion of their portfolios to riskier investments, opening the way for them to put money into venture capital.

Cash wasn’t the only thing of value venture capitalists supplied. They also sat on the boards of the compa-

nies they invested in, guiding them through the business thickets until they could go public. Needing tangible evidence of achievement—and something to sell if an investment went sour—venture capitalists often insisted that companies they invested in develop a patent portfolio, which was one reason why so many patents were filed in the 1980s and ‘90s.

More than a few stunning venture capital successes had a transformative effect on the economy, from companies such as Apple and Genentech in the early years to Google 20 years later. Enabled by the commercialization of the Internet, venture capital-supported companies such as Amazon and eBay developed business models that supported the efforts of thousands of smalltime entrepreneurs to reach new markets. Unfortunately, by the late 1990s the allure of the Internet as a catalyst for new enterprises attracted huge amounts of unwary money into venture capital funds at just the time when the first generation of professional fund managers

were retiring. Not surprisingly, when their young, inexperienced successors poured the new money into fields they considered “hot,” the casualty rate among new companies was high. In the latter stages of the stock market’s “irrational exuberance,” dot-com firms that did *not* receive venture capital financing were more likely to survive than those that did.

By the turn of the 21st century, venture capital had matured into an industry. In the geographical areas where the firms were concentrated—Silicon Valley, Austin, and Boston—they supplied up to a third of all

capital used for start-ups. But the excesses of the dot-com boom were still working their way through the system. Venture capital firms that did not fail outright faced not only a backlog of prior investments that required continued infusions of cash but a client base of investors who now wanted greater and more secure returns than the firms were able to offer. In important areas such as biosciences, would-be entrepreneurs found it harder and harder to raise early-stage money, while recent start-ups faced difficulties in refinancing for the growth phases of their businesses. Venture capital, it turned out, had become a misnomer, its practitioners risk averse, seeking the same secure returns and high yields as other investors. Initial public offerings plummeted from the hundreds a few years ago to fewer than 10 in 2008 and 2009.

If past patterns were a reliable guide to the future, today's capital scarcity would favor large corporate entrepreneurs. In the wake of the worst financial downturn since the Great Depression, most of the smaller entrepreneurial companies that avoided bankruptcy have been running for cover. Many biotech start-ups and medical device companies, for example, have welcomed their own takeover, even at heavily discounted prices, by large pharmaceutical companies. But few large U.S. corporations are in a good position to vigorously pursue innovation. They are under intense shareholder pressure to produce bigger profits as they compete for investor dollars with higher-yielding leveraged investments available through hedge funds and private equity outfits. In a development uncomfortably reminiscent of the 1920s, low interest rates have allowed such firms to use cheap money to increase their leverage and funnel dollars into investments with more certain or much higher returns than technology-based start-ups. Some of the pension funds and endowments that suffered most in the financial crisis reportedly are trying to make up their losses by taking on even riskier investments. None of this is good news for entrepreneurs.

The intense pressure for higher yields on investments threatens to stifle entrepreneurial behavior in all its forms. Only a few companies, such as Google, and large foundations, such as Skoll or Gates, have preserved the independence to follow their own investment agendas. In a few high-priority domestic areas for government funding, such as alternative energy and

information technology systems for medical applications, resources are still available for individual entrepreneurs and small firms. Certain Internet-enabled fields, especially social networking, are attracting private funding and individual entrepreneurs. But while the Internet is shoving aside venerable businesses, from newspapers to the recording industry, many of its leading companies are still trying to figure out how to get their customers to pay for their products.

Meanwhile, globalization and privatization are encouraging broader shifts in investment patterns. High-growth markets such as China, India, and Brazil are claiming investment capital that U.S. domestic corporations might otherwise have invested in entrepreneurial ventures. At the same time, immigrant entrepreneurs with experience and profits from earlier U.S. ventures and access to home-country networks are redeploying their assets back home, encouraged by governments eager for overseas investment. The wars in the Middle East and Afghanistan have created new business opportunities in outsourcing—which is essentially privatized government—but few of the firms in this field are giving entrepreneurship a good name.

Throughout the modern era, financial innovators have played an indispensable role in launching fresh waves of entrepreneurship, and they are once again hard at work designing novel investment vehicles. But few of today's new products are likely to foster creative enterprises. Investors can now buy shares of patent portfolios, for example. Their promoters promise that this will provide entrepreneurs with speedier returns on their intellectual property. It is even possible to invest in lawsuits involving intellectual property. One thing we know about such offerings is that they will enrich the financial intermediaries who assemble them. They will also gum up the works with endless unresolved patent suits, raise the costs of innovation, and promote even higher levels of financial risk taking. Creative finance can be the lifeblood of entrepreneurship, but today it is more like a parasite, with entrepreneurs increasingly in service to finance rather than the other way around. Unless that changes, entrepreneurs are likely to play a far smaller role in renewing the U.S. economy than they have in the past. ■