

# The Great Leap

## Driving Innovation From the Base of the Pyramid



Billions of poor people aspire to join the world's economy. Disruptive innovation can pave the way, helping companies combine sustainable corporate growth with social responsibility.

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**G**lobal companies today are struggling with a Catch-22. On one side is the legacy of the 1990s, when investors became accustomed to double-digit annual growth. While investors are no doubt revising their expectations now that the bubble has burst, they are not ready to give up on demands for rapid, steady growth in

the companies they fund. This need to find new markets or products is in itself a huge challenge.

Add to that the second part of the dilemma: Antiglobalization demonstrations have made it apparent that if corporate expansion is seen to come at the expense of the poor and the environment, it will encounter vigorous resistance. This is not just an issue for a few thousand protesters. As multinationals unrelentingly seek new growth to satisfy shareholders, they increasingly hear concerns from many quarters about environmental degradation, labor exploitation, cultural hegemony and local autonomy. What is to be done? Must corporations' thirst for growth and profits serve only to exacerbate the antiglobalization movement?

On the contrary, a solution to this dilemma does exist. Companies can generate growth *and* satisfy social and environmental stakeholders through a "great leap" to the base of the economic pyramid, where 4 billion people aspire to join the market economy for the first time.<sup>1</sup> This is not a question simply of doing the right thing in order to lift people out of poverty — although that will surely be a result of the leap we have in mind. From a senior executive's point of view, it's a matter of finding the most exciting growth markets of the future, an especially important task for major corporations considering that 69% of the S&P 500 had below-average growth in 1999 and that turnover in the S&P 500 has

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increased over the years to 10% annually. The majority of large companies seem to be mired in saturated markets that have few significant growth opportunities.<sup>2</sup> The base of the pyramid is, so to speak, completely unsaturated.

It is also where the technologies that are needed to address the social and environmental challenges associated with economic growth can best be developed. So far, technological advances in the developing world have been under the radar of executives in the industrialized economies. We've learned, however, that companies are profitably disrupting traditional approaches to business problems in such industries as telecommunications, consumer electronics and energy production, to name just a few. These and many other opportunities are ready to explode in the coming years.

### **Creative Creation**

Economist Joseph Schumpeter's term "creative destruction" has become justifiably well known in recent years, but it tells only half the story. Before the destruction of industry leaders occurs as a result of disruptive innovation, a long period of "creative creation" typically can be discerned.

Keep in mind the fundamental conditions that lead to the success of a disruptive innovation.<sup>3</sup> The product or service must be one that initially isn't as good as those being used by customers in mainstream markets; as a result, it can take root only in new or less demanding applications among nontraditional customers. Because well-managed companies are under pressure to pursue innovations in markets that can sustain corporate growth rates and enhance overall profit margins, they conclude that investing in disruptive innovations is irrational. Potential disrupters are thus able to incubate their businesses in the safety of markets that resource-rich competitors are motivated to ignore; upstarts will then seek to grow upmarket by successively attacking market tiers that are the least attractive of the investment options facing the industry leaders.

Disruptive innovations allow many more people to begin doing things for themselves that could only be done either with the help of skilled intermediaries or by the wealthy before the disruptions (examples include the tabletop copier and online trading). The social good is well served through disruption which has, over the decades, created millions of jobs, generated hundreds of billions of dollars in revenues and market capitalization, and raised standards of living by making available cheap, high-quality products. The magnitude of creative creation in the disruptive process has dwarfed the extent of creative destruction.

And yet that progress has taken place almost exclusively at the peak of the population pyramid. That is, disruptive innovation has at first benefited the poorer and less-skilled people in

developed countries before shifting upward toward members of higher tiers in those same countries. It has improved the quality of life of just a small fraction of the world's population — at most, 1 billion of the world's 6.1 billion people. (See "Disrupting the Pyramid.") In much of the world, people's basic needs go unmet. In these circumstances, new waves of disruptive technology deployed by companies making a great leap down the pyramid have an extraordinary potential to generate growth.

### **Disruptive Potential**

Developing countries are ideal target markets for disruptive technologies for at least two reasons. First, business models that are forged in low-income markets travel well; that is, they can be profitably applied in more places than models defined in high-income markets. Honda's success with motorcycles provides an example. In the 1950s, Honda began selling motorized bicycles to small distributors in the crowded and impoverished Japanese cities that were rebuilding from the ruins of World War II. The company developed a business model in which it could make money selling its products at very low price points. When Honda entered the U.S. market in the early 1960s with the Supercub, the product's simplicity and low price meant that people who lacked the money or boldness to own a Harley Davidson could buy and drive motorcycles. Honda's base in impoverished Japan gave the company a huge competitive advantage in disrupting U.S. motorcycle makers because it could make money at prices that were unattractive to the established leaders.

Toyota and Sony followed the same recipe and enjoyed decades of success while taking on the market leaders in developed countries. In fact, the industries that constituted the engine of Japan's economic miracle from the 1960s to the 1980s all followed the disruptive strategy of attacking markets that established competitors wanted to avoid because their likely revenues and profits were unattractive to them. Disruption was the nation's strategy of national economic development. The reason that Japan's economy has suffered from no growth for a decade is that its institutions will not permit new waves of disruptive innovation to be launched against today's multinational giants — the very companies that were yesterday's disrupters.<sup>4</sup>

In addition to having more adaptable business models, disruptive innovators also compete against nonconsumption — that is, they offer a product or service to people who would otherwise be left out entirely or poorly served by existing products and who are therefore quite happy to have a simpler, more modest version of what is available in high-end markets. That is the second reason why developing countries are often better markets initially for new growth businesses. When companies searching for growth fight against capable competitors to win



the business of savvy customers in established markets, the barriers to success are formidable.<sup>5</sup>

General Motors must answer questions about consumption versus nonconsumption in China, where it recently opened a Buick assembly plant. GM's apparent strategy of competing against consumption pits the Buick against prestige brands like Mercedes, BMW and Lexus in a battle to win the business of China's wealthiest and most sophisticated consumers. Even if GM succeeds in winning over this segment of the Chinese market, the plant would have a very difficult time producing cars for export. China lacks the infrastructure of quality materials and suppliers needed to make vehicles with the functionality and consistency that are expected in the markets of western Europe and North America. In short, GM faces an uphill climb on two fronts.

Now consider the possibilities inherent in GM's recently announced joint venture with a Chinese company to produce and sell "minivehicles." If the venture were able to figure out how to profitably make and market a small, simple, fuel-efficient \$4,000 car to the Chinese middle class (for whom automobile ownership has not yet been possible), the potential upside would be enormous. As it begins to sell millions of vehicles in China, GM would likely find its Chinese business unit to be an ideal platform from which to export slightly bigger, slightly more powerful and sophisticated cars to emerging markets in eastern Europe and Russia. Ultimately, it could begin attacking the low end of the U.S. market. If GM were to follow a strategy of creative creation (as it seems to be doing in making a \$1 billion commitment to build a hydrogen-powered car within a decade) and were to compete against nonconsumption in China's domestic market first, it could make money selling to customers whose demands for performance constitute a readily surmountable hurdle, even as it builds a business that has extraordinary growth potential.

### **Microwaves for the Masses**

Although the arrival of the minivehicle still lies in China's future, other disruptive products are already available. A Chinese company called Galanz has achieved extraordinary growth through a first great leap downward, and it is poised to replicate the formula. In 1992, Galanz decided to enter the market for microwave ovens, even though it was a textile and garment manufacturer at the time. The global market for microwaves was mature and shrinking, and it was hard to differentiate products because most of them were good enough to do what people wanted them to do. Manufacturing had migrated to countries where labor costs were low, and consumption was concentrated in developed

countries. In China, only 2% of all households owned a microwave oven. Most families did not have kitchens large enough to accommodate the available models, which had been designed to fit into homes in the West.

Rather than pursue the obvious strategy of using inexpensive Chinese labor to make lower-cost ovens for export, Galanz's founder Qingde Liang chose to compete against nonconsumption in the domestic market. Galanz introduced a simple, energy-efficient product at a price that was affordable by China's middle class and small enough to fit in their kitchens. As sales

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steadily climbed, Liang stimulated demand by using the company's ever-declining cost per unit to reduce the product's price. Galanz's domestic market share rose from 2% in 1993 to 76% of a much larger market in 2000. Armed with a business model that could earn attractive profits at low price points, Galanz moved upmarket to manufacture larger machines that had more features. It began to disrupt the microwave-oven markets in developed countries: By 2002, its global market share was 35%.

Galanz has not been content to rest on its accomplishments with one product. In 2000, the company launched an effort to replicate its disruptive success in the home air conditioning industry — again, competing against nonconsumption by making a simple, low-cost, energy-efficient product that is good enough to cool the small homes and apartments in which most middle-income Chinese live. The results are not yet in, but the potential for this business is extraordinary.

### **Connections for the Poor**

Galanz's success demonstrates the possibilities for disruptive change affecting people in the middle of the pyramid. But the feasibility of disruptive business models has also been demonstrated in numerous experiments at the very bottom, where more than 4 billion people earn less than \$1,500 annually in terms of purchasing power parity. Perhaps the best known experiment involves the Grameen family of enterprises in Bangladesh. The original Grameen Bank, one of the originators of microcredit in the developing world more than 20 years ago, has since spawned several spinoff ventures, including Grameen Telecom, which brings information and communication technology to rural Bangladesh.



## Disrupting the Pyramid

In the past, major waves of growth have been created by innovations that have had an impact only on the bottom of developed markets. Disruptive innovations at the base of the pyramid — home to billions of the aspiring poor — have much greater potential than those that begin and end in developed markets.



More than 3 billion people around the world lack reliable telecommunications service. A big part of the reason is the cost involved in extending wire-line infrastructure from urban to rural areas. In rural Bangladesh, average per capita income is \$286 per year, a level that makes the existing business model for telephone service unfeasible. Only a disruptive model could change the situation.

Accordingly, Grameen Telecom has focused on bringing wireless service to the country's poor. Initially, few gave the venture much hope since only the richest city dwellers in Bangladesh could afford their own mobile phones. But Grameen Telecom, following the bank's microcredit model, came up with an innovative approach. It lent up to \$175 to women in rural villages — independent entrepreneurs who became known as the “wireless women of Grameen.” The loan amount covered the cost of a mobile phone, a small solar recharger unit, and the training needed to use and service the equipment. Once equipped and trained, the entrepreneurs could then sell phone usage on a per-call basis at an affordable price to others in their villages.

The pilot project started with 950 villages, and the results were impressive.<sup>6</sup> Village phone operators increased their income on average by about \$300 per year. They spent much of this additional income on their children's education and health care, another boost for Bangladesh's future development. The women of Grameen also saw their status in the villages rise considerably as a result of their role in providing the new service.

Users of the service benefited greatly as well. They no longer

had to endure time-consuming, expensive travel to secure information about, for example, crop prices; nor did they have to place orders with distributors through a slow, unreliable postal system. Each call saved the average user between \$2.70 and \$10, a figure representing up to 10% of household monthly income. Environmental advantages also became clear, in the forms of reduced vehicle usage for travel and the avoidance of construction associated with a wire-line infrastructure.

The business model also proved to be highly profitable for Grameen. In comparison with their urban counterparts, the rural phones booked three times the revenue per phone: \$100 per month for a village phone versus about \$30 per month in the city. If extended to all of

rural Bangladesh, the business could generate revenues in excess of \$100 million per year. (If a similar model were applied to rural India and China, tens of billions of dollars of revenue would be at stake.) Recently, Grameen Telecom began offering rural Internet access via kiosks. An emerging telecom company in India, n-Logue, has adopted a similar business model; it has developed new technology to dramatically lower connection costs in rural areas using “wireless local loop” technology that separates voice and data traffic. The revenue and profit potential for this business are enormous.<sup>7</sup>

Meanwhile, telecommunications giants in developed countries have spent billions on 3G technology and spectrum licenses, hoping to provide enough bandwidth so that current customers can use wireless devices to do things that they now do on the wire-line Internet. Those investments have crippled many companies and are unlikely ever to produce adequate returns. Far better to compete against nonconsumption at the base of the pyramid, and then to migrate from that profitable base toward successively more sophisticated customers and applications in global markets.

## Power to the People

Beyond the mandate to sustain corporate growth lurks another challenge that increasingly will vex multinationals: the extent to which they contribute to, or detract from, sustainable development.<sup>8</sup> Affluent countries account for more than 75% of the world's energy and resource consumption and create the bulk of the industrial, toxic and consumer waste; if the developed



world's model of commerce and consumerism were to become the standard everywhere, it would require the equivalent of more than four Earths to supply the raw materials, fossil fuels and waste sinks that would be needed.<sup>9</sup> Clearly, a different model is called for.

For most corporations, environmental management and clean technology efforts are driven by the demands of their established markets. They would do better to focus on developing countries, which constitute the best initial markets for environmentally friendly technologies. When environmental innovations are targeted at developed markets from the outset, they are pitted against wasteful but inexpensive and entrenched technologies and aimed at customers who are extremely unforgiving. Again, competing against nonconsumption is the better route.

Consider the problem of electric power generation and distribution. In rich countries, the existing power infrastructure is made up of large, centralized facilities and an extensive grid system for transmission and distribution. But there is also growing investment in disruptive innovations based on what is called the "distributed generation" of power; these include such technologies as solar photovoltaics, wind turbines, fuel cells and micro-turbines. In addition to taking advantage of renewable fuels, these technologies generate small quantities of electricity (under 1 megawatt) near the actual point of use, thereby avoiding the need for expensive distribution infrastructure. In 2000, global venture-capital investment in distributed generation surpassed \$800 million (up from about \$100 million in 1996).

In the developed world, the difficulty facing innovators is the existence of a well-developed, sunk-cost grid system, which (at least for now) wipes away any cost advantages associated with distributed generation. In these markets, cost-accounting systems and rate structures that are tailored to the centralized generation of power make it difficult for such technologies to gain a foothold.

But distributed generation has much more promise in the developing world. Consider that more than 2 billion people in the world have no access to dependable electric power. For people in distant rural areas, no grid system exists, and the massive capital investments needed to build such systems mean that it could be decades before they are built. As a consequence, the rural poor now spend much of their income on candles, kerosene and diesel in order to have periodic electrical service and lighting at night. If offered a viable substitute, these people might abandon dangerous and polluting fuels in favor of clean and efficient electric power. The potential market is huge and made up of people who would welcome innovations that

cannot now compete in developed markets. Yet few producers of distributed-generation technologies have targeted the rural poor at the base of the pyramid as their initial market.

The crucial breakthrough for sustainable energy technologies will not take place in a laboratory. Instead, such technologies must be incubated and refined where they can be profitably deployed through disruptive strategies, in markets where they do not compete against established systems. Pioneering companies will have to optimize a new technology for use in poor rural areas and develop production, sales, service and microfinancing packages that enable nonconsumers to gain access.

Rolltronics, a start-up in Menlo Park, California, may be just such a pioneer.<sup>10</sup> The company has devised a method of producing semiconductor circuits on a flexible substrate such as plastic or foil, using a continuous roll-to-roll production process, similar to that used in printing on paper. The technology has important implications for power consumption at the base of the pyramid.

The roll-to-roll process is a classic disruptive technology: It can produce certain low-end types of semiconductor circuits at markedly lower costs. Compared with the current approach, in which chips are produced in billion-dollar fabrication facilities using millions of gallons of water and toxic chemicals, roll-to-roll processing is modular and clean. Low capital costs (as low as \$10 million per facility) make it possible to locate smaller production facilities closer to end markets.

Another pioneer in this area, Iowa Thin Film Technologies of Ames, Iowa, is already making roll-to-roll solar photovoltaic cells that could be used for the rural, off-grid market in the developing world. These solar cells don't generate a lot of power, but the homes of potential customers aren't filled with

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power-hungry appliances. And while photovoltaics can't be relied upon at night or on cloudy days, the technology still promises a substantial improvement to those who would otherwise have no electric power at all.

To make this disruptive innovation competitive in developed markets and even more useful in poor countries, local production and low-cost power storage will be needed. Rolltronics is



piloting roll-to-roll technology capable of producing the solar cells and low-cost, thin-film batteries that will make such storage feasible. Eventually, both the cells and the batteries could be made in small, relatively inexpensive factories located directly in the countries they would serve, helping to foster a fully integrated, indigenous, distributed solar industry. Other companies have begun to recognize the magnitude of the opportunity: Shell, through a joint venture with Akzo Nobel, has made investments in the development of roll-to-roll solar capability.

Sustainable energy pioneers who focus on the base of the pyramid could set the stage for one of the biggest bonanzas in the history of commerce, since extensive adoption and experience in developing markets would almost certainly lead to dramatic improvements in cost and quality. If companies such as Rolltronics create a business model that can be profitable in those markets, solar energy has a chance. But that is the only strategy that can possibly succeed in this area — absent massive and perpetual government subsidies.

## A Leap Beyond Faith

The theory of disruptive innovation suggests that existing mainstream markets are the wrong place to look for major new waves of growth. Forcing a potentially disruptive innovation into a sustaining business model — thereby putting it on a collision course with incumbents — will only ensure its early demise. Our thinking about the potential rewards resulting from a great leap to the base of the pyramid extends this concept as a framework not just for corporate growth but also for more balanced macroeconomic development. Indeed, the great leap holds the potential to address the root causes of antiglobalization sentiments.

If history is any guide, most of the growth opportunities in this vast, untapped market will be seized by entrepreneurs (like Grameen and Galanz) in developing countries — just as the opportunities in impoverished postwar Japan were captured by innovators such as Sony, Honda and Toyota. Global corporations, however, shouldn't assume that such an outcome is inevitable; they, too, can seize growth opportunities before they become threats. To do so, they will have to build new business models that include governance and organizational structures better suited to conditions at the base of the pyramid. And, as is always the case in pursuing disruptive innovation, companies will need to manage the opportunities independently from the processes and values of their mainstream global businesses.

Our research on such ventures stresses the importance of focusing technology and product-development resources directly on the needs of the poor; it also points to the need to build long-term relationships with such partners as local communities, local companies and nongovernmental organizations.<sup>11</sup> Global companies

that follow the principles of disruptive innovation and set their sights on the developing world will not simply be taking a leap of faith. By taking a great leap to the base of the pyramid, they will be giving themselves a chance for sustained corporate growth while also helping to lift the poor out of poverty and opening the way to sustainable growth for the global economy.

## REFERENCES

1. For a general discussion of this topic, see C.K. Prahalad and S.L. Hart, "The Fortune at the Bottom of the Pyramid," *Strategy+Business* 26 (January 2002): 54-67.
2. On the volatile fortunes of large companies, see G. Hamel, "Leading the Revolution" (Boston: Harvard Business School Press, 2000) and R. Foster and S. Kaplan, "Creative Destruction: Why Companies That Are Built to Last Underperform the Market — and How To Successfully Transform Them" (New York: Currency, 2001).
3. See C. Christensen, "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail" (Boston: Harvard Business School Press, 1997).
4. C. Christensen, T. Craig and S.L. Hart, "The Great Disruption," *Foreign Affairs* (March-April 2001): 80-95.
5. We have heard Professors Michael Porter and Kim Clark of the Harvard Business School independently say that manufacturers in developing countries must strive to make high-quality products at low cost — not low-quality products at low cost — in order to successfully compete in developed global markets. We agree with their assertions insofar as they are applied to competing against consumption (attacking established markets). Customers who already enjoy consuming products of a given functionality and consistency rarely jump at the chance to pay less for products that aren't as good or as reliable. But the products of disruptive innovators need not meet such stringent hurdles because nonconsumption is the alternative, and customers often prefer something to nothing, even if that something is not very good from a high-end market viewpoint. That is not to say that disruptive innovations targeted at nonconsumption are low in quality, just that they have a different (often more modest) package of functionality at the outset.
6. For details, see D. Richardson, R. Ramirez and M. Haq, "Grameen Telecom's Village Phone Programme in Rural Bangladesh: A Multi-Media Case Study" (Guelph, Ontario: TeleCommons Development Group, 2000).
7. J. Howard, C. Simms and E. Simanis, "Sustainable Deployment for Rural Connectivity: the n-Logue Model" (Washington, D.C.: World Resources Institute, 2001).
8. For a more detailed treatment of this issue, see S.L. Hart, "Beyond Greening: Strategies for a Sustainable World," *Harvard Business Review* 75 (January-February 1997): 66-76.
9. M. Wackernagel and W. Rees, "Our Ecological Footprint: Reducing Human Impact on the Earth" (Gabriola Island, British Columbia: New Society Publishers, 1996).
10. "Just Press Print," *The Economist*, March 3, 2001, 73-74.
11. The Base of the Pyramid Learning Laboratory at the University of North Carolina's Kenan-Flagler Business School has conducted extensive case study research on multinational corporations and indigenous ventures focused on the base of the pyramid.

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