

The World Turned Upside Down

The Economist: A special report on innovation in emerging markets

April 17, 2010

IN 1980 American car executives were so shaken to find that Japan had replaced the United States as the world's leading carmaker that they began to visit Japan to find out what was going on. How could the Japanese beat the Americans on both price and reliability? And how did they manage to produce new models so quickly? The visitors discovered that the answer was not industrial policy or state subsidies, as they had expected, but business innovation. The Japanese had invented a new system of making things that was quickly dubbed "lean manufacturing".

This special report will argue that something comparable is now happening in the emerging world. Developing countries are becoming hotbeds of business innovation in much the same way as Japan did from the 1950s onwards. They are coming up with new products and services that are dramatically cheaper than their Western equivalents: \$3,000 cars, \$300 computers and \$30 mobile phones that provide nationwide service for just 2 cents a minute. They are reinventing systems of production and distribution, and they are experimenting with entirely new business models. All the elements of modern business, from supply-chain management to recruitment and retention, are being rejigged or reinvented in one emerging market or another.

Why are countries that were until recently associated with cheap hands now becoming leaders in innovation? The most obvious reason is that the local companies are dreaming bigger dreams. Driven by a mixture of ambition and fear—ambition to bestride the world stage and fear of even cheaper competitors in, say, Vietnam or Cambodia—they are relentlessly climbing up the value chain. Emerging-market champions have not only proved highly competitive in their own backyards, they are also going global themselves.

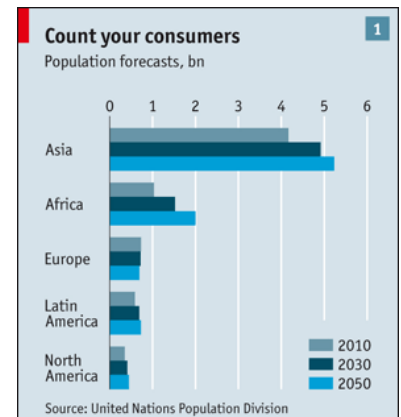
The United Nations World Investment Report calculates that there are now around 21,500 multinationals based in the emerging world. The best of these, such as India's Bharat Forge in forging, China's BYD in batteries and Brazil's Embraer in jet aircraft, are as good as anybody in the world. The number of companies from Brazil, India, China or Russia on the *Financial Times* 500 list more than quadrupled in 2006-08, from 15 to 62. Brazilian top 20 multinationals more than doubled their foreign assets in a single year, 2006.

At the same time Western multinationals are investing ever bigger hopes in emerging markets. They regard them as sources of economic growth and high-quality brainpower, both of which they desperately need. Multinationals expect about 70% of the world's growth over the next few years to come from emerging markets, with 40% coming from just two countries, China and India. They have also noted that China and to a lesser extent India have been pouring resources into education over the past couple of decades. China produces 75,000 people with higher degrees in engineering or computer science and India 60,000 every year.

The world's biggest multinationals are becoming increasingly happy to do their research and development in emerging markets. Companies in the *Fortune* 500 list have 98 R&D facilities in China and 63 in India. Some have more than one. General Electric's health-care arm has spent more than \$50m in the past few years to build a vast R&D centre in India's Bangalore, its biggest anywhere in the world. Cisco is splashing out more than \$1 billion on a second global headquarters—Cisco East—in Bangalore, now nearing completion. Microsoft's R&D centre in Beijing is its largest outside its American headquarters in Redmond. Knowledge-intensive companies such as IT specialists and consultancies have hugely stepped up the number of people they employ in developing countries. For example, a quarter of Accenture's workforce is in India.

Both Western and emerging-country companies have also realised that they need to try harder if they are to prosper in these booming markets. It is not enough to concentrate on the Gucci and Mercedes crowd; they have to learn how to appeal to the billions of people who live outside Shanghai and Bangalore, from the rising middle classes in second-tier cities to the farmers in isolated villages. That means rethinking everything from products to distribution systems.

Anil Gupta, of the University of Maryland at College Park, points out that these markets are among the toughest in the world. Distribution systems can be hopeless. Income streams can be unpredictable. Pollution can be lung-searing. Governments can be infuriating, sometimes meddling and sometimes failing to provide basic services. Pirating can squeeze profit margins. And poverty is ubiquitous. The islands of success are surrounded by a sea of problems, which have defeated some doughty companies. Yahoo! and eBay retreated from China, and Google too has recently backed out



from there and moved to Hong Kong. Black & Decker, America's biggest toolmaker, is almost invisible in India and China, the world's two biggest construction sites.

But the opportunities are equally extraordinary. The potential market is huge: populations are already much bigger than in the developed world and growing much faster (see chart 1), and in both China and India hundreds of millions of people will enter the middle class in the coming decades. The economies are set to grow faster too (see chart 2). Few companies suffer from the costly "legacy systems" that are common in the West. Brainpower is relatively cheap and abundant: in China over 5m people graduate every year and in India about 3m, respectively four times and three times the numbers a decade ago.

This combination of challenges and opportunities is producing a fizzing cocktail of creativity. Because so many consumers are poor, companies have to go for volume. But because piracy is so commonplace, they also have to keep upgrading their products. Again the similarities with Japan in the 1980s are striking. Toyota and Honda took to "just-in-time" inventories and quality management because land and raw materials were expensive. In the same way emerging-market companies are turning problems into advantages.

Until now it had been widely assumed that globalisation was driven by the West and imposed on the rest. Bosses in New York, London and Paris would control the process from their glass towers, and Western consumers would reap most of the benefits. This is changing fast. Muscular emerging-market champions such as India's ArcelorMittal in steel and Mexico's Cemex in cement are gobbling up Western companies. Brainy ones such as Infosys and Wipro are taking over office work. And consumers in developing countries are getting richer faster than their equivalents in the West. In some cases the traditional global supply chain is even being reversed: Embraer buys many of its component parts from the West and does the assembly work in Brazil.

Old assumptions about innovation are also being challenged. People in the West like to believe that their companies cook up new ideas in their laboratories at home and then export them to the developing world, which makes it easier to accept job losses in manufacturing. But this is proving less true by the day. Western companies are embracing "polycentric innovation" as they spread their R&D centres around the world. And non-Western companies are becoming powerhouses of innovation in everything from telecoms to computers.

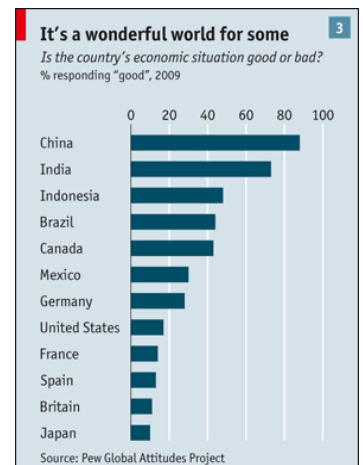
Rethinking innovation

The very nature of innovation is having to be rethought. Most people in the West equate it with technological breakthroughs, embodied in revolutionary new products that are taken up by the elites and eventually trickle down to the masses. But many of the most important innovations consist of incremental improvements to products and processes aimed at the middle or the bottom of the income pyramid: look at Wal-Mart's exemplary supply system or Dell's application of just-in-time production to personal computers.

The emerging world will undoubtedly make a growing contribution to breakthrough innovations. It has already leapfrogged ahead of the West in areas such as mobile money (using mobile phones to make payments) and online games. Microsoft's research laboratory in Beijing has produced clever programs that allow computers to recognise handwriting or turn photographs into cartoons. Huawei, a Chinese telecoms giant, has become the world's fourth-largest patent applicant. But the most exciting innovations—and the ones this report will concentrate on—are of the Wal-Mart and Dell variety: smarter ways of designing products and organising processes to reach the billions of consumers who are just entering the global market.

No visitor to the emerging world can fail to be struck by its prevailing optimism, particularly if his starting point is the recession-racked West. The 2009 Pew Global Attitudes Project confirms this impression. Some 94% of Indians, 87% of Brazilians and 85% of Chinese say that they are satisfied with their lives. Large majorities of people in China and India say their country's current economic situation is good (see chart 3), expect conditions to improve further and think their children will be better off than they are. This is a region that, to echo Churchill's phrase, sees opportunities in every difficulty rather than difficulties in every opportunity.

This special report will conclude by asking what all this means for the rich world and for the balance of economic power. In the past, emerging economic leviathans have tended to embrace new management systems as they tried to consolidate their progress. America adopted Henry Ford's production line and Alfred Sloan's multidivisional firm and swept all before it



until the 1960s. Japan invented lean production and almost destroyed the American car and electronics industries. Now the emerging markets are developing their own distinctive management ideas, and Western companies will increasingly find themselves learning from their rivals. People who used to think of the emerging world as a source of cheap labour must now recognise that it can be a source of disruptive innovation as well.

First break all the rules

The charms of frugal innovation

GENERAL ELECTRIC'S health-care laboratory in Bangalore contains some of the company's most sophisticated products—from giant body scanners that can accommodate the bulkiest American football players to state-of-the-art intensive-care units that can nurse the tiniest premature babies. But the device that has captured the heart of the centre's boss, Ashish Shah, is much less fancy: a hand-held electrocardiogram (ECG) called the Mac 400.

The device is a masterpiece of simplification. The multiple buttons on conventional ECGs have been reduced to just four. The bulky printer has been replaced by one of those tiny gadgets used in portable ticket machines. The whole thing is small enough to fit into a small backpack and can run on batteries as well as on the mains. This miracle of compression sells for \$800, instead of \$2,000 for a conventional ECG, and has reduced the cost of an ECG test to just \$1 per patient.

In Chennai, 200 miles (326km) farther east, Ananth Krishnan, chief technology officer of Tata Consultancy Services (TCS), is equally excited about an even lower-tech device: a water filter. It uses rice husks (which are among the country's most common waste products) to purify water. It is not only robust and portable but also relatively cheap, giving a large family an abundant supply of bacteria-free water for an initial investment of about \$24 and a recurring expense of about \$4 for a new filter every few months. Tata Chemicals, which is making the devices, is planning to produce 1m over the next year and hopes for an eventual market of 100m.

These innovations are aimed at two of India's most pressing health problems: heart disease and contaminated water. Some 5m Indians die of cardiovascular diseases every year, more than a quarter of them under 65. About 2m die from drinking contaminated water. The two companies are already at work on "new and improved"—by which they mean simpler and cheaper—versions of these two devices.

Budget-minded

There is nothing new about companies adapting their products to the pockets and preferences of emerging-market consumers. Unilever and Procter & Gamble started selling shampoo and washing powder in small sachets more than two decades ago to cater for customers with cramped living spaces and even more cramped budgets. Nike produces an all-enveloping athletic uniform to protect the modesty of Muslim women athletes. Mercedes puts air-conditioning controls in the back as well as the front of its cars because people who can afford a Mercedes can also afford a driver.

But GE and TCS are doing something more exciting than fiddling with existing products: they are taking the needs of poor consumers as a starting point and working backwards. Instead of adding ever more bells and whistles, they strip the products down to their bare essentials. Jeff Immelt, GE's boss, and Vijay Govindarajan, of the Tuck Business School, have dubbed this "reverse innovation". Others call it "frugal" or "constraint-based" innovation.

There is more to this than simply cutting costs to the bone. Frugal products need to be tough and easy to use. Nokia's cheapest mobile handsets come equipped with flashlights (because of frequent power cuts), multiple phone books (because they often have several different users), rubberised key pads and menus in several different languages. Frugal does not mean second-rate. GE's Mac 400 ECG incorporates the latest technology. Many cheap mobile handsets allow users to play video games and surf the net. Frugal often also means being sparing in the use of raw materials and their impact on the environment.

The number of frugal products on the market is growing rapidly. Tata Motors has produced a \$2,200 car, the Nano. Godrej & Boyce Manufacturing, one of India's oldest industrial groups, has developed a \$70 fridge that runs on batteries, known as "the little cool". First Energy, a start-up, has invented a wood-burning stove that consumes less energy and produces less smoke than regular stoves. Anurag Gupta, a telecoms entrepreneur, has reduced a bank branch to a smart-phone and a fingerprint scanner that allow ATM machines to be taken to rural customers.

Frugal innovation is not just about redesigning products; it involves rethinking entire production processes and business models. Companies need to squeeze costs so they can reach more customers, and accept thin profit margins to gain volume. Three ways of reducing costs are proving particularly successful.

The first is to contract out ever more work. Bharthi Airtel, an Indian mobile company that charges some of the lowest fees in the business but is worth \$30 billion, has contracted out everything but its core business of selling phone calls, handing over network operations to Ericsson, business support to IBM and the management of its transmission towers to an independent company. To make this work, Bharthi had to persuade its business partners to rethink their business models too. For example, Ericsson had to agree to be paid by the minute rather than for selling and installing the equipment, and rival mobile companies to rent their towers rather than own them outright.

The second money-saver is to use existing technology in imaginative new ways. TCS is looking at using mobile phones to connect television sets to the internet. Personal computers are still relatively rare in India but televisions are ubiquitous. TCS has designed a box that connects the television to the internet via a mobile phone. It has also devised a remote control that allows people who have never used keyboards to surf the web. This idea is elegant as well as frugal: by reconfiguring existing technology it can potentially connect millions of people to the internet.

The third way to cut costs is to apply mass-production techniques in new and unexpected areas such as health care. Devi Shetty is India's most celebrated heart surgeon, having performed the country's first neonatal heart surgery on a nine-day-old baby, and numbered Mother Teresa among his patients. Yet his most important contribution to medicine is not his surgical skill but his determination to make this huge industry more efficient by applying Henry Ford's management principles. He believes that a combination of economies of scale and specialisation can radically reduce the cost of heart surgery. His flagship Narayana Hrudayalaya Hospital in the "Electronics City" district of Bangalore, not far from GE, Infosys and Wipro, has 1,000 beds (against an average of 160 beds in American heart hospitals), and Dr Shetty and his team of 40-odd cardiologists perform about 600 operations a week.

The sheer number of patients allows surgeons to acquire world-class expertise in particular operations, and the generous backup facilities allow them to concentrate on their speciality rather than wasting their time on administration. Dr Shetty has performed more than 15,000 heart operations and other members of his team more than 10,000. The hospital charges an average of \$2,000 for open-heart surgery, compared with \$20,000-100,000 in America, but its success rates are as good as in the best American hospitals.

Dr Shetty has devoted much of his energy to boosting his customer base, largely for humanitarian reasons but also because he believes that higher volumes lead to better quality. He has established video and internet links with hospitals in India, Africa and Malaysia so that his surgeons can give expert advice to less experienced colleagues. He also sends "clinics on wheels" to nearby rural hospitals to test for heart disease. He has created a health-insurance scheme, working with various local self-help groups, that covers 2.5m people for a premium of about 11 cents a month each. About a third of the hospital's patients are now enrolled in the scheme. A sliding scale of fees is used for operations so that richer customers subsidise poorer ones. The entire enterprise is surprisingly profitable given how many poor people it treats. Dr Shetty's family-owned hospital group reports a 7.7% profit after taxes, compared with an average of 6.9% in American private hospitals.

The group has recently built three other hospitals next to the heart clinic—a trauma centre, a 1,400-bed cancer hospital and a 300-bed eye hospital. They all share central facilities such as laboratories and a blood bank. Dr Shetty is also setting up "medical cities" in other parts of the country. Over the next five years his company plans to increase its number of beds to 30,000, making it the largest private-hospital group in India and giving it more bargaining power when it negotiates with suppliers, thus driving down costs further.

From jugaad to shanzhai

Indians often see frugal innovation as their distinctive contribution to management thinking. They point to the national tradition of *jugaad*—meaning, roughly, making do with what you have and never giving up—and cite many examples of ordinary Indians solving seemingly insoluble problems. But China is just as good as India at coming up with frugal new ideas. Mindray, for example, specialises in cheap medical products such as ECG devices, and BYD has radically reduced the price of expensive lithium-ion batteries by using less costly raw materials and learning how to make them at ambient temperatures rather than in expensively heated "dry rooms". This has reduced their price from \$40 to \$12 apiece and made them competitive with less powerful nickel-cadmium batteries.

The Chinese have made two distinctive contributions to frugal innovation. The first is the use of flexible networks—powered by *guanxi* or personal connections—to reduce costs and increase flexibility. Li & Fung, a Hong Kong-based company, has long been a pioneer, working closely with a network of about 12,000 companies operating in more than 40 countries. It puts together customised supply chains from its vast network of associates and keeps an eye on quality and order fulfilment. Similarly, Dachangjiang, a motorcycle-maker in China's Guangdong province, works with hundreds of parts suppliers.

These post-modern *guanxi* have several powerful qualities. They can contract or expand with demand. Li & Fung and Dachangjiang seldom have problems with excess capacity when times are hard or with waiting lists when times are flush. And they can be turned into engines of innovation. Li & Fung relies on its partners to help solve problems, not just fulfill orders. Dachangjiang provides its suppliers with rough sketches rather than detailed blueprints and encourages them to innovate.

A second area where the Chinese excel is in “bandit” or “guerrilla” innovation, known as *shanzhai*. The original bandits lived in isolated villages and carried out raids on upright citizens. Today’s bandits live at the margins of official society but are much in evidence: in Shanghai’s People’s Square you will be offered a cheap watch or phone at every step.

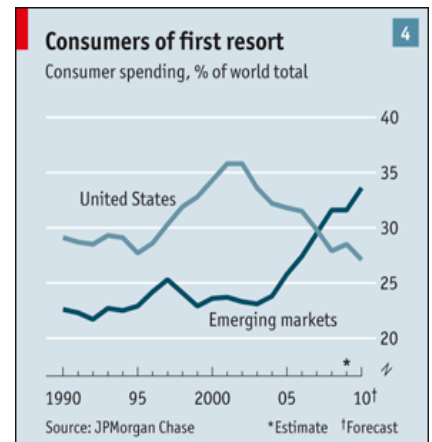
These bandits are parasites who profit from China’s weak property rights, but they are also talented innovators, quickly producing copies of high-tech gadgets that are cheap enough for migrant workers to be able to afford them but also fashionable enough for young professionals to covet them. Some of the more exotic phones are designed to look like watches or packets of cigarettes (they even have room for a few real ones) and often have striking new features, such as solar chargers, superloud speakers, telephoto lenses or ultraviolet lights that make it easier to detect forged currency. In their own way the bandits deploy as much innovation and ingenuity as their legitimate counterparts.

Grow, Grow, Grow

What makes emerging-market companies run

THE view from the 87th-floor lobby of Shanghai’s Grand Hyatt hotel is a wonder to behold (if you can behold it through the ever-threatening smog). Lesser skyscrapers glow with the logos of global giants such as Citi and HSBC. The river carries ships loaded with the riches of the world’s workshop. High-rise housing projects stretch into the distance: the city’s population, already 19m, is forecast to grow to 45m by 2025.

The emerging world is enjoying the most spectacular growth in history. Its share of global GDP (at purchasing-power parity) increased from 36% in 1980 to 45% in 2008 and looks set to grow to 51% in 2014. Emerging-market consumers have been outspending the Americans since 2007; by last year their share of global consumption had gone up to 34% against America’s 27% (see chart 4).



This dynamism shows no signs of waning. Emerging countries are shaking off the recession as developed countries continue to struggle. In the last quarter of 2009 Thailand grew at an annual rate of 15.3% and Taiwan at 18%. Many economists expect growth in emerging markets to be four percentage points higher than growth in the rich world for at least the next five years.

Thanks to such rapid advances, many of the developing world’s champions have risen from zero to hero in just a couple of decades. In 1990 Mittal was an unknown producer making steel in Indonesia. Today, as ArcelorMittal, it is the world’s largest steel company, bigger than the next three combined. Lenovo, which did not exist in 1990, bought IBM’s personal-computer business five years ago and is now the world’s fourth-largest PC-maker, after Hewlett-Packard and Dell. South African Breweries in 1990 was a local brewer confined to its home country by anti-apartheid laws. Today it is one of the world’s three largest beer companies.

That sort of growth is not confined to local champions. The current boss of L’Oréal’s Chinese operations, Paolo Gasparrini, arrived in the country in 1996 with just a briefcase full of cosmetics. Now L’Oréal’s Chinese operations represent \$150m-worth of investment and the company treats China as a manufacturing hub, producing cosmetics for most of Asia, as well as one of its most important markets.

Growth shapes the outlook of the corporate world. There is a buccaneering spirit abroad that is rare in the West, born from a mixture of optimism and arrogance. The business news buzzes with stories of acquisitions and start-ups. The corporate go-getters love to explain that if you can make it here, despite the poverty, the dismal infrastructure and the unpredictable politicians, you can make it anywhere.

The growth is driven as much by companies’ internal dynamics as by the abundance of opportunities. The importance of volume means they have to keep expanding in order to justify their investments. The ambitions of their relatively youthful

workforce push in the same direction. Their up-and-coming managers have never experienced anything but hypergrowth, and their lower ranks are staffed by young men in a hurry who expect to be given their heads.

To flourish in this atmosphere, it helps to have the spirit of a frontier settler, not a corporate bureaucrat. Companies are obsessed with grabbing their share of the frontier, both geographical and technological, before somebody else does. This puts a premium on both speed and flexibility. But businesses also sometimes engage in lateral moves that make little sense to Western managers. A property company, say, might suddenly move into computers. Rather than worrying about synergies or core competences, they see opportunities and seize them.

The pursuit of growth is forcing firms to engage in relentless innovation, nowhere more so than in two of the basic building blocks of corporate management: mergers and acquisitions (M&A) and recruitment and retention. Even as Western companies reeled from the recent recession, emerging-market giants went on a shopping spree. India's Tata Consultancy Services bought Citigroup Global Services, the outsourcing division of the American bank, for \$512m in October 2008. HCL, another Indian technology group, snapped up Britain's Axon Group for \$672m two months later. Reliance Industries, yet another Indian company, is pursuing LyondellBasell Industries, a chemical company, in a \$14.5 billion bid, and Bharti Airtel is in the process of gobbling up Zain, a leading African telecoms company, for \$9 billion.

Nirmalya Kumar, of the London Business School, says that two things are allowing emerging-market giants to rewrite the rules of M&A: money and flexibility. The combination of rapid growth and extensive internal restructuring has left many companies with plenty of cash in their pockets. Profit margins of 10% are common, double the average in the West. And because ownership is concentrated, companies find it easier to take risks. Business families and founding entrepreneurs, with large shareholdings in their companies, are willing to make long-term bets on growth and do not have to worry about losing control of their companies if their stocks take a nosedive.

Reverse M&A

Mr Kumar points out that emerging-market firms have a different approach to M&A from their Western counterparts. They are less interested in cutting costs—through synergies, greater efficiency and lower head count—because they know that they can deal with those issues by plugging their acquisitions into their low-cost production machines at home. What is much more important to them is to acquire the skills, brands and distribution channels that will enable them to join the club of world-class companies. In many ways this is “reverse M&A” to complement reverse innovation: instead of Western companies buying cheap manufacturing in the developing world, emerging-market companies are buying sophisticated corporate machinery in the West.

India's Hindalco is a good example. The aluminium company used a succession of well-planned acquisitions to turn itself into a global force, boosting its revenues from \$500m to \$15 billion in seven years. It was not just trying to achieve rapid growth (which it already enjoyed) or deal with overcapacity (which was not an issue). Instead it identified internal weaknesses and systematically eliminated them.

Perhaps Mr Kumar is being a tad bullish. The Tata Group's two big acquisitions of British companies—Jaguar Land Rover for \$2.3 billion and Corus Group for \$12 billion—have not lived up to expectations. The company paid too much at the height of the boom. Some emerging-market acquisitions are driven by a combination of hubris and frontier mentality. Bharti Airtel bid for Zain because it was looking for virgin territory for its low-cost business model as the Indian market became saturated. But with emerging markets continuing to surge, local champions will be on the prowl for more acquisitions.

Touting for talent

The maharajah's palace in Mysore is one of the architectural wonders of southern India, built to awe the local population as well as to delight a succession of princes. Yet it is tiny compared with Infosys's 335-acre campus nearby, which houses one of the world's largest corporate universities. It has a permanent faculty of 250, trains some 10,000 new “Infosysians” a year and provides advanced instruction for thousands of existing employees. It is awash with swimming pools, gyms, tennis and badminton courts, a multiplex cinema, a cricket pitch, an enormous laundry and 5,000 bicycles.

Everything about the campus is designed to underline the company's claim that it is world-class, not just an Indian company that happens to have had a good run. Its mantra is “No caste, no creed, only merit”. The buildings are a strange mixture of international styles. One of the training centres looks like a Disneyland version of Washington's Capitol, and the multiplex resembles a giant glass golf ball. The Taj Mahal meeting room sits next to the John Pierpont Morgan lecture hall. To a young Indian on the way up all this says that the world is his oyster. No wonder most Infosysians like to bring their extended families to tour the campus.

Infosys grasped from the start that to challenge global companies such as IBM it would have to attract India's best and brightest. In 1993 it decided to go public, even though it did not need the cash, in large part in order to be able to build a campus that could rival anything America could offer. It not only paid more than its rivals, it was also one of the first Indian companies to issue stock options to its employees, so they had a much better chance of becoming a millionaire than if they worked for a foreign multinational.

This investment in talent has paid huge dividends over the past two decades of pell-mell growth. The company's workforce has swollen from 10,000 in 2001 to more than 105,000 today, and its market capitalisation has risen to \$35 billion. Other companies are now imitating its model. India's office parks and electronic cities are full of training campuses churning out the bright and ambitious citizens of a new and more meritocratic India.

Emerging countries in general, and China and India in particular, boast a huge number of relatively cheap brainworkers. Between them these two countries produce twice as many people with advanced degrees in engineering or computer sciences as the United States every year (more if you allow for the fact that 50% of American engineering degrees are awarded to foreigners, most of them Indians or Chinese). This is one of the main reasons why Western companies have started to move their R&D activities to the emerging world—and why companies such as Infosys and Huawei are challenging the Western giants.

Yet staff turnover in India and China's high-tech sector has continued to average 25-30% during the recession. One reason is that companies are growing much faster than the education infrastructure. Infosys and Huawei increased their sales by more than 40% last year. Another reason is that the region is so new to world-class competition: challenging the West on quality is much harder than on price. Moreover, the available talent pool is much smaller than the raw numbers suggest. Senior managers of high quality are rare because the Indian economy was closed until the early 1990s and China sacrificed an entire generation to the Cultural Revolution. Many of the millions of graduates churned out by the local universities lack the skills to compete with the world's best. McKinsey reckons that only 25% of India's engineering graduates, 15% of its finance and accounting professionals and 10% of those with degrees of any kind are qualified to work for a multinational company.

Emerging-market companies are thus confronted with two huge interconnected problems: recruiting and retaining workers at a time of rapid growth, and producing a world-class workforce virtually overnight. This is producing a flurry of innovation in what is infelicitously known as "human-resource management". Companies not only need to think more imaginatively about recruitment than Western companies do, they also have to devote more effort to continuing training. The combination of rapid growth and high staff turnover means that they are always in danger of losing the very skills that have made them successful.

Companies have made vigorous use of two tried-and-trusted tools—sticks and carrots—to turn themselves into world-class employers. Everybody has heard stories of Asian bosses who stopped the conveyor belt and smashed the products coming off it to show that they would not tolerate substandard output. But there are also plenty of stories of extravagant bonuses being handed out freely.

China's Haier is a market leader in the vigorous use of sticks and carrots. The company has made pay 100% performance-related. It also makes extensive use of naming and shaming. Photographs of local managers are prominently displayed in every workplace and marked with a magnetic badge (a red smiley face for good performance, a yellow frowning one for doing badly). The company also celebrates outstanding innovators in public ceremonies and names new products and business innovations after the people who think them up.

Other companies reach deep into local traditions to motivate their workers. Brian Gu left school at 16 and started repairing air-conditioning systems. He is now the boss of Yongguan, one of China's largest shelving companies. One of his biggest problems when he started his business in 1988, he recalls, was the attitude of his workers: they spat on the floor and generally behaved in a disrespectful manner. Mr Gu used a combination of relentless exhortation and Buddhist philosophy to make them more disciplined.

Now they listen to Western classical music as they work. Posters list the times of the next quality-circle training sessions. The walls are plastered with improving notices such as "Quality is our life" and "Concept innovation leads to innovation in management". The factory is laid out according to *feng-shui* principles, with the buildings arranged so that they are full of sunlight. Mr Gu's *pièce de résistance* is the Buddhist garden next to the factory. The best workers have trees planted in their name. Poor performers are sent to spend time in a temple to contemplate a giant statue of the Buddha.

The best companies in emerging markets treat "talent" as a supply chain that needs to be relentlessly managed, not an isolated problem that can be solved on a piecemeal basis. The glitzy training centres are only the beginning. Firms also

invest heavily in creating “educational ecosystems”. They dispatch managers to give speeches at universities. GE, for instance, has charged each of its top ten managers in China with cultivating relations with a particular university. They spot bright youngsters and treat them to tours of their campuses and scholarships.

This enthusiasm for education and training is not limited to high-tech companies. Pantaloon, a huge Indian retailer that is opening new shops at the rate of one a week, invests in local business schools. Nor is it confined to first-tier cities such as Shanghai and Bangalore. Intel decided to deal with the problem of labour shortages by setting up an operation in Chengdu, an industrial city that has not so far attracted brain-intensive companies, and improving the quality of local education. The company works closely with the schools and universities in the area. The price of high growth is continuous investment in human capital.

Here be dragons

The emergina world is teemina with new business models

IN DECEMBER 1872 *HMS Challenger* sailed from Portsmouth to conduct the most ambitious survey of the oceans ever. During the ship’s four-year journey the crew discovered over 4,000 unknown species and provided invaluable material for the raging debate about evolution.

Business travellers in today’s emerging markets often feel a bit like the *Challenger’s* crew. They constantly come across what to Western eyes look like exotic corporate species and new, unfamiliar kinds of business which raise profound questions about the evolution of companies and business models.

Most emerging countries have a penchant for highly **diversified conglomerates**. India’s Tata Group, which accounts for almost 6% of the country’s GDP, has subsidiaries in carmaking, agricultural chemicals, hotels, telecommunications and consulting. Reliance Industries’ range sprawls from petrol products and clothes to fresh food. But such diversification is not confined to giant organisations. China is full of small and medium-sized companies that have fingers in many pies, taking advantage of opportunities as they arise.

Many emerging countries also rely heavily on **state-owned enterprises**. These organisations are peculiar hybrids that have never been seen before; the closest relatives are the European trading companies of the 16th-19th centuries, such as Britain’s East India Company. They are not old-fashioned nationalised companies run by the government and designed to control chunks of the national economy, but nor are they classic private-sector companies that sink or swim. Instead they are amphibious creatures that flit between sea and land, borrowing money from governments at subsidised rates one moment, plunging into the global market the next.

China and Russia are the main exponents. Thousands of Chinese companies have convoluted ties to central or local government. Russia has created a large class of state companies that enjoy various legal privileges. But countries in Latin America and the Middle East are jumping onto the hybrid bandwagon.

Hybrid organisations are particularly prominent in the energy sector. The world’s 13 largest oil companies, as measured by reserves, are all controlled by governments, and three-quarters of the world’s crude-oil reserves are in the hands of state-backed companies. Many of China’s best high-tech companies, such as China Telecom and Lenovo, are also state-backed. But such organisations are active in lots of other areas too. Like the developing world’s private giants, they are often diversified.

Adapt and survive

In their different ways both of these corporate forms are creative responses to their circumstances, much like the exotic ocean creatures that the *Challenger’s* crew dredged up from the depths. Diversified conglomerates can adapt to environments rife with political and financial risks. Tarun Khanna, of the Harvard Business School, argues that they are also good at dealing with shortages of vital resources such as capital and talent. The Tata Group can use capital from established businesses to support growth in new ones, and has the resources to attract and train the best people. It can also use its brand name to sell all sorts of products. Indians who have grown up enjoying Tata tea might be more inclined to buy the latest Tata electric car.

State-owned companies also draw on long traditions. Authoritarian governments can use them to direct economic activity (and also to preserve their economic power). Local entrepreneurs can use them to seize business opportunities. And even Western multinationals can use them to gain access to difficult markets. Looked at one way, a huge organisation such as China Mobile is a throwback to an earlier era; looked at another way, it is an attempt by those in charge to embrace a more dynamic economy—an evolutionary change.

How are these companies likely to fare as they compete in a global marketplace? Most Westerners have little time for diversified conglomerates; they expect a “conglomerate discount” when they buy such shares on the stockmarket, and regard them as a primitive corporate form that will tend to disappear as local stockmarkets improve and investors rather than companies get to do the diversifying. But the inefficiency of capital markets is only one of the reasons for diversification. Two of the others—talent shortages and brand-building—are likely to be around for a long time yet. Conglomerates may have an enduring advantage in attracting and training talent in rapidly growing markets, and in building brands in regions where brand recognition is low and potential consumers are numbered in their billions rather than millions. The Tata Group reckons that its brand is worth about 100 billion rupees (\$2.2 billion).

The case for state-owned companies is less robust. Hybrid companies are inherently confused organisations: unclear whether they are responsible to the state or the marketplace, and buffeted by contradictory pressures. They are subject to political meddling, often called upon to save “strategic” jobs and regularly used to oil the state patronage machine. Outsiders often find it hard to know whether to treat them as a business or an arm of government. And the OECD says that state-owned enterprises have significantly lower levels of productivity than private firms. But the road to real privatisation will be a long one, and the recent financial meltdown has hardly made emerging-market governments more favourably disposed towards the Anglo-Saxon model.

It would be foolish for Western companies to dismiss these new corporate life forms as evolutionary dead ends, but there is little scope for emulating them. The same is not true of many of the business models that the emerging world has come up with. They are not only important innovations in their own right but have serious implications for the way that Western companies run their affairs.

Learning from the masters

Three of them are particularly powerful. The first concerns rethinking economies of scale, which usually involves **scaling up**. Companies reduce unit costs by centralising their manufacturing and producing long runs of standardised items. But centralised production adds expensive layers of bureaucracy, and it is hard to make it work in emerging markets where populations are often widely scattered and distribution systems abysmal.

The Boston Consulting Group notes that a growing number of entrepreneurs in the emerging world are replacing scaling up with **scaling out**, which means involving a wider range of people in the process of production and distribution, something that has been made much easier by mobile phones and the internet. The most successful examples of this are clinics on wheels, but there are plenty of others. Nutriset, a French manufacturer of fortified food for malnourished children, has outsourced production to local franchises in Africa. The company maintains quality control and the franchises are close enough to the children to make distribution quick and easy. Kenya’s Child and Family Wellness Shops offer shares in the company to the nurses who operate the clinics, which encourages them to serve more children and helps stem the brain drain from rural areas.

A second business model takes an equally contrarian approach to production. John Hagel and John Seely Brown, who run Deloitte’s Centre for Edge Innovation, argue that Western companies have spent the past century perfecting “push” models of production that allocate resources to areas of expected demand. But in emerging markets, particularly those where the Chinese have a strong influence, a very different “**pull**” model often prevails, designed to help companies mobilise resources when the need arises. Hong Kong’s Li & Fung or China’s Chingqing Lifan Group can use their huge supply chains to produce fashion items or motorcycles in response to demand. Taiwan’s Quanta and Compel can produce cheap computers and digital cameras for a fashion-conscious digital marketplace.

These pull models fundamentally change the nature of companies. Instead of fixed armies looking for opportunities, firms become loose networks that are forever reconfiguring themselves in response to a rapidly shifting landscape. Such models are not peculiar to emerging markets: Dell builds computers to its Western customers’ specifications, and Western management gurus have been advocating networks for decades. But according to Messrs Hagel and Seely Brown they are far more widespread in emerging countries.

The developing world’s most innovative business model may be the **application of mass-production techniques to sophisticated services**. This started with India’s outsourcing firms, which demonstrated that economies of scale and scope could be reaped from services that used to be highly fragmented and geographically rooted. These outsourcers are still expanding and moving upmarket. Indian consultancies are now challenging Western ones in complex services, not just dealing with customer complaints.

Emerging-market entrepreneurs want to apply these techniques beyond IT and the back office. For example, they see a huge market for legal services requiring a high level of expertise. Dr Shetty is only one of many Indians who are applying Henry Ford’s principles to health care. LifeSpring has reduced the cost of giving birth in a private hospital to \$40 by

looking after many more mothers. Aravind, the world's biggest eye-hospital chain, performs some 200,000 eye operations a year. It takes the assembly-line principle literally: four operating tables are laid side by side and two doctors operate on adjacent tables. When the first operation is done, the second patient is already in place.

The power to disrupt

Business innovations from emerging markets will change the rich world too

DURING the long boom of the 1950s and 1960s the Marxist intelligentsia in the rich countries, furious at their proletariat's refusal to rise up in revolt, turned to the third world instead. Frantz Fanon celebrated anti-colonial revolutionaries in "The Wretched of the Earth" (1961). A generation of student radicals wore Che Guevara T-shirts and chanted "Ho, Ho, Ho Chi Minh" at any passing university dean.

These days the third world is known as the emerging markets, the Che Guevara T-shirts are made in China and the wretched of the earth are enjoying growth rates that are the envy of the former colonial powers. Moreover, these emerging markets are likely to shake things up not only in their own backyards but in rich countries too. Clayton Christensen, of the Harvard Business School, has coined the term "disruptive innovation" for new products that slash prices and new processes that radically change the way they are made and delivered. Today many of these disruptive innovations hail from the emerging markets. They will make a bigger difference to life in the West than lean production, the previous great disruptive management innovation from the East.

There are four reasons why things will move faster and further this time. The first is that the markets for corporate control and for senior managerial talent are much more liquid than they were 20 years ago. The great Japanese and South Korean giants grew organically, whereas emerging-market champions are keen on mergers and acquisitions. They have access to highly developed capital markets, both public and private, and to armies of experienced investment bankers and consultants. In 2007, before the crisis struck, Chinese companies did \$30 billion-worth of outbound deals, 60% more than the previous year and \$5 billion more than inbound deals. The figure for Indian companies was \$35 billion, five times more than the previous year and \$10 billion more than inbound deals. The gold rush continues. This year has already produced two mega-bids by Indian giants: Bharti Airtel's for Zain and Reliance's for LyondellBasell.

The second factor is the sheer size of the emerging markets. The Japanese export machine was powered by just a few engines, notably cars and electronics. By contrast, the emerging-market export machine has engines in almost every industry. ArcelorMittal is the world's biggest steel company. Infosys and TCS are among the world's biggest IT companies. Haier is the fourth-largest manufacturer of home appliances. ZTE, which started foreign operations only in 1997, looks set to become one of the world's top five mobile-handset maker. Just a decade ago not a single emerging-market company could be considered world-class. Today such companies are among the world's leaders in 25 big industries, according to the Boston Consulting Group.

The third reason to expect a big impact is the emphasis on volume. Emerging-market companies are obsessed by finding new markets to make up for their slim profit margins. Indian and Chinese mobile-phone companies have been adding 8m-10m new subscribers a month for the past few years. Emerging-world giants such as Infosys and ZTE have been growing at more than 40% a year.

Fourth, the West's best companies have grasped the potential of emerging markets. Henry Ford II, who ran the Ford Motor Company for decades after the second world war, continued into the 1980s to dismiss Japanese cars as "those little shitboxes". By contrast, the best Western companies are now looking to emerging markets as sources of innovation and growth. Cisco expects 20% of its best people to work in its "Cisco East" centre in the future. Britain's Prudential, a financial-services company, has recently bid \$35.5 billion for the Asian assets of American International Group. If the bid goes through, the company will be earning more than half its overall profits from Asia.

The West is ripe for frugal innovation. Western consumers and governments have been on a debt-fuelled spending spree for many years. American household debt rose from 65% of GDP in the mid-1990s to 95% in 2009. The American government was cutting taxes and raising public spending even before the recession struck. The British government increased public spending from 35% of GDP in 2000-01 to 43% in 2009-10.

Look at my new hair shirt

Now the age of profligacy is giving way to an age of austerity. Governments are having to put their fiscal houses in order and consumers are cutting back on their spending, worried about unemployment and shrinking wealth (American household wealth dropped by 22% between 2007 and 2009). An annual survey of consumer spending by Booz &

Company suggests that two-thirds of Americans are trading down and buying cheaper items. Andy Bond, the boss of Asda, a British retailer, says the frivolous is now unacceptable and the frugal is “cool”.

But these spending cuts will inevitably dampen growth in the West, creating yet more demand for frugality. Historically, big financial crises have been followed by long periods of slow growth and economic malaise, and the recent crisis has been bigger than most. Olivier Blanchard, the IMF’s chief economist, predicts that painful retrenchment in Europe could last for 20 years.

Moreover, the need for such retrenchment comes at a time when demand for welfare services is rising as the baby-boomers start to retire and medical innovations push up health-care costs. By 2050 one in three people across the rich world will be drawing a pension. America’s Congressional Budget Office predicts that spending on entitlements will grow from 10% of GDP today to 16% in 2035. Many European countries, particularly in the south, will come under even greater pressure. The search for cutbacks in public spending will become ever more urgent. According to Thomson Reuters, America’s health-care system wastes \$600 billion-850 billion every year because of inefficient administration, unnecessary treatment and litigation costs. (On the other hand it has proved to be a huge job-creation machine.)

Dr Shetty first started thinking about the dismal management of health care when, as a trainee doctor at Guy’s hospital in London, he had to spend hours sitting around doing nothing. Most Western bureaucrats try to deal with such problems with successive rounds of cost-cutting. But the experience of the emerging markets suggests that “cost innovation”—redesigning both products and processes from scratch to take out costs—is a much more productive strategy.

A growing number of Western company bosses have become aware of the potential for such innovations to change the way business is done in the West. Carlos Ghosn of Renault has praised India’s frugal innovation. Jeff Immelt of GE has backed the idea that his company should disrupt itself with cheap products from India and China. When Arun Sarin was boss of Vodafone, he sent his top executives to India to learn about its low-cost business model.

Shifting the centre of gravity

The same message can be heard from management gurus. Peter Williamson, of the Judge Business School at the University of Cambridge, regards emerging markets as repositories of “value-for-money strategies for recessionary times”. John Hagel and John Seely Brown have even predicted “blowback” from emerging-world innovations: the Western companies that exported capitalism to developing countries in the first place may soon find themselves humbled by more innovative companies from that part of the world.

Frugal innovation is already beginning to make itself felt in the West, particularly in health care. GE’s cheap ultrasound device, originally developed for the Chinese market, has become the basis of a global business, with eager customers in the developed as well as the developing world. This year 6m Americans are expected to travel to developing countries such as India in search of affordable health care, up from 750,000 in 2007. At the same time Dr Shetty is building a 2,000-bed hospital in the Cayman Islands, a short flight from Miami, where he will offer surgery at half the price charged by American hospitals.

But the trend is apparent in consumer goods too. Haier has become the market leader in the West for cheap fridges. Most Western carmakers are producing small, inexpensive vehicles that have been influenced by the Nano. Mahindra & Mahindra’s nifty little tractors are popular with hobby farmers and gardeners in America.



Westerners have long been less enthusiastic about globalisation than people in emerging markets. According to the 2009 Pew Global Attitudes Project, only 65% of Americans think that external trade and business ties are good for their country, compared with more than 90% of Indians and Chinese. Hostility to globalisation in the developed world is likely to grow as emerging giants disrupt one product market after another. Yet such disruption will bring benefits as well as problems for rich countries. Re-engineered medical devices could slash health-care costs without reducing the quality of care. Compact cars will allow people to keep driving but cause less damage to the environment.

The developed world still has some powerful weapons in its arsenal. The average Western company is much better managed than the average emerging-world company (see chart 6): for every Infosys and Haier there are plenty of poorly managed and uncompetitive firms in developing countries. America in particular is remarkably good at encouraging entrepreneurial start-ups and allowing them to grow. Michael Gibbert, of Italy’s Bocconi University, notes that the West also has a long tradition of inventiveness in hard times, demonstrated during the second world war. Mr Williamson points out that Western companies such as Wal-Mart are already making a success of value-for-money strategies. And some of

the most articulate promoters of reverse engineering and frugal innovation from emerging countries run Western companies or teach in Western business schools.

Even so, the new management paradigm now taking shape in the emerging world has big implications for the global balance of power. The world's creative energy is shifting to the developing countries, which are becoming innovators in their own right rather than just talented imitators. A growing number of the world's business innovations will in future come not from "the West" but "the rest".

Anand Mahindra, vice-chairman of the eponymous family firm, says that these days when Indians go to bed at night their dreams about their country's future "are not just colourful but steroidal". His compatriots are at last beginning to believe that "the sandcastles we build in our minds are not going to be simply washed away by the morning tide." The same is true across the emerging world, whose "sandcastles" are now being built on the solid foundations of business innovation. They will endure, changing not just emerging markets but the rest of the world as well.