The future of the life sciences industries: Aftermath of the global recession
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Equity markets are trending upward, GDP is growing again in many regions of the world, and consumer confidence appears to be returning — all positive developments after the shock waves of 2008 and 2009. And it should be good news for the life sciences industries as well. After all, no major players in these industries went bankrupt or needed a bailout. The recovery should simply return life sciences to business as usual, right?

Well, the answer might not be so simple. To be sure, the challenges facing the life sciences industries before the “great recession” still remain — patent expiration, product development challenges, the unknown impact of health reform and other legislation, and changes in the competitive landscape. Only now companies must confront these challenges against a backdrop of economic uncertainty, skittish capital markets, and an intensified drive to cut costs.

So what is the real impact, then, of the global economic downturn on life sciences? In seeking the answer, the Deloitte Touche Tohmatsu (Deloitte) Life Sciences and Health Care (LSHC) Industry Group, in collaboration with the Economist Intelligence Unit (EIU), conducted research involving senior life sciences industry executives as well as leaders from the business and regulatory communities and academia. The resulting white paper, The future of the life sciences industries: Aftermath of the global recession, reveals that, while the impact of the recession may not seem monumental on the surface, there are long-term implications that may affect the industry landscape for years to come.

Even as the rate of change in the industry accelerates, our research indicates that one thing remains clear: companies will continue to look to innovation to drive their strategy and future success. Economic uncertainty cannot be allowed to encroach on this reality. Because only with innovative new technologies and products — driven by robust research and development — can a full recovery be achieved — and sustained.

Robert Go
Dtt Life Sciences and Health Care Industry Group Leader
The future of the life sciences industries: Aftermath of the global recession is a Deloitte Touche Tohmatsu (Deloitte) white paper developed in collaboration with the Economist Intelligence Unit (EIU). The findings and views expressed in this report are drawn from a global survey and individual interviews conducted with industry leaders.

To assess the short- and long-term impact of the global recession on the life sciences industries, the Economist Intelligence Unit, in collaboration with Deloitte’s Global Life Sciences and Health Care Industry Group, conducted an online survey of 281 senior industry executives during September-October 2009. Of the respondents, 133 are board members or C-level executives.

Geographically, 33 percent of respondents are from Western Europe; 26 percent are from North America; 28 percent are from Asia-Pacific; and the remainder is from the Middle East, Africa, and Latin America. Forty-six percent of respondents work for companies with global annual revenue exceeding US$500 million. Respondents all hail from the life sciences industries, led by pharmaceuticals at 30 percent (R&D, manufacturing, or wholesale distribution), medical devices (16 percent), biotechnology (14 percent), and contract research organizations (6 percent). The remainder is from health care services, distribution, and health insurance.

Our thanks are due to all survey respondents and industry interviewees for their time and insights. The EIU bears sole responsibility for this report, which was written by Alexandra Wyke, in collaboration with Reynold W. (Pete) Mooney, DTT Global Life Sciences and Health Care Consulting Leader.
The future of the life sciences industries — which comprise pharmaceutical, biotechnology, and medical device manufacturers, as well as their service providers and distributors. The question is whether the impact is temporary or more strategic and long-lasting. In a survey of life sciences executives conducted by the Economist Intelligence Unit in collaboration with Deloitte Touche Tohmatsu’s (Deloitte) Global Life Sciences and Health Care Industry Group, a majority of industry executives believe the effect of the downturn has been moderate and will only be temporary. Yet they also predict the demise of a large portion of the biotech segment and other more entrepreneurial enterprises. Also, a sizeable minority of 17 percent believe their company’s strategy will change significantly as a result of the recession.

That said, the survey results suggest the recession has created a new dynamic that will have long-term implications. Health plans, whether public or private, are focused intensively on curbing cost. The industry faces the imminent expiration of many patents, which has significant revenue implications for the whole system. Evolving generics legislation, including the drive toward biosimilars, will encourage the continued push toward generic drugs. All of these trends were in play before the recession, but the downturn appears to have accelerated their impact.

The unpredicted near-collapse of the capital markets has had a chilling effect on the entrepreneurial side of the market, which has all but ground to a halt. Survey respondents believe this is likely to have longer-term implications on where and how innovation occurs. Not only have smaller players been affected by the capital crunch, but the increased sensitivity of financial markets to large corporate debt is also inhibiting some companies from embarking on larger-scale mergers and acquisitions. Taken together, these factors will drive the direction of the life sciences industries for the foreseeable future.

Notsurprisingly, companies have focused on cutting costs. Those that had cost-cutting initiatives under way stepped them up; others initiated new programs as an immediate response to the downturn. What is surprising is that cutbacks have included downsizing research and development (R&D) expenditures. Ironically, this is the one area that survey respondents indicate will determine longer-term success post-recession.

The situation appears critical for the biotechnology segment. Forty-four percent of survey respondents believe that 20 to 40 percent of existing biotech companies won’t exist in five years as a result of the global recession. The equivalent figure for biotech executives surveyed was a more pessimistic 68 percent. In addition, nearly one-third (32 percent) of respondents predict an outflow of scientists from smaller companies to larger ones. With the dearth of new entrepreneurial entries, the future for this sector looks grim.

Although it is difficult to assess the long-term impact of the recession on the life sciences industries, the survey results indicate that the following outcomes — to a greater or lesser extent — seem clear:

• Companies that can sustain their focus on innovation will be the eventual “winners” in the marketplace. The paradox is that while survey respondents acknowledge this fact, nearly one-third (32 percent) say that their company is reducing R&D spend and 43 percent indicate that their company is focusing on products with immediate returns, more likely to be extensions of existing products rather than fundamental new-product research.

• For the foreseeable future, the trend toward smaller, more entrepreneurial ventures has been reversed. Innovation will shift back toward larger and better-capitalized competitors.
Because of the current state of the financial markets, moves to consolidate are on hold, besides those that were initiated before the recession. But as capital market pressure eases, the drive to cut costs and gain operational efficiency will re-emerge strongly. Companies will look for opportunities to gain synergies across their sales forces, in operations and in overhead areas. Cross border transactions will accelerate and the “global big” are likely to get bigger.

The ongoing emphasis on cost from health plans will have a profound and lasting impact on life sciences companies. The recession has dramatically increased the use of new tools like comparative effectiveness. Companies will increasingly be forced to justify the value of their products in terms of patient outcome.

A slow recovery of the capital markets, particularly in venture capital and private equity, will influence the growth and resilience of the biotechnology sector. The lines between biotech and pharmaceuticals, already blurred, will become fuzzier as the major pharmaceutical players use their capital to expand more aggressively into large molecule research, which was previously the prerogative of biotech.

The decline in R&D spending has had severe repercussions for the services sector of the industry, most notably among contract research organizations (CROs). Nearly one-third (31 percent) of CRO executives who responded to the survey say that the recession had a major impact on their organization. Winners in the CRO space will likely be those that can move from a transactional to a relationship/risk-sharing model with their customers.

Generics manufacturers are likely to be major beneficiaries of the recessionary fallout. With healthcare costs in the spotlight and legislation changing to favor generics globally, generics producers will be able to make greater inroads into areas that proved resistant pre-recession. Legislation regarding biosimilars is now even opening the biotech arena to generics competition. Companies like Novartis, Daiichi Sankyo and Sanofi-aventis, acknowledging the trend, have hedged their bets by acquiring generics manufacturers. The trend is bound to continue.

Emerging markets will become the life sciences battleground of the future, not just as regions where low-cost processes can be performed, but as growing, affluent markets in their own right. According to 35 percent of survey respondents, emerging markets will become the most profitable geographic areas for life sciences. With China, India, Brazil, Russia, Mexico, and Turkey — which together account for 45 percent of the world’s population — recovering faster than the more fully developed markets, the emerging markets have gained in importance as a result of the recession.

According to conventional wisdom, it would seem that the life sciences industries were largely immune to the global recession of 2008-10. Unlike industries such as automotive, none of the large pharmaceutical manufacturers faced bankruptcy or needed large government bail-outs. Most companies even maintained profit margins that would be the envy of competitors in other industry segments.

Yet this recession will likely be remembered as one of the defining moments in the history of life sciences. That is the finding of a survey of 281 senior life sciences executives from September to October 2009, conducted by the Economist Intelligence Unit (EIU) in collaboration with Deloitte Touche Tohmatsu’s (Deloitte) Global Life Sciences and Health Care Industry Group. Their responses reveal that, while the immediate financial hit of the recession has been mostly absorbed, industry forces already in play will only be intensified by this most recent downturn and may permanently reshape the look of the industry.
Pharmaceuticals, medical devices, and biotechnology firms were already facing extraordinary challenges before the downturn, driven by significant changes to underlying fundamentals in these industries. Chief among these are the unprecedented expiration of blockbuster drug patents over the next several years, which by some estimates could cost the industry almost US$60 billion in revenue for the drugs going off patent in 2010 and 2011. The drive toward wholesale healthcare reform in the United States — not to mention elsewhere around the world — is another major driver of change. In many cases, the recession has accelerated these and other changes that were already under way.

The recession has also created a new dynamic that, while subtle, is likely to have significant longer-term implications for the overall shape of the industry and the nature of competition. As the recession deepened, two specific factors had immediate impact. First, public and private health plans around the world sought ways to reduce their costs through pricing pressure. Drugs and device manufacturers, already under pricing pressure, were squeezed ever-harder as the recession took hold. Health plans pushed back on pricing, looking for outright reductions and more actively promoting the use of generics. Governments explored new legislation that contemplated new taxes on the industry and also promulgated new tools such as comparative effectiveness.

The second trend was the near-collapse of the global capital markets. This had immediate implications for even the largest competitors in the industry, several of which had initiated major transactions just prior to autumn 2008. For example, Roche, which announced its intention to acquire the part of Genentech it did not already own during the summer of 2008, took nearly ten months to complete the US$46.8 billion transaction. Venture-capital funding and private equity all but dried up, leaving the biotechnology sector and other smaller companies struggling to fund their operations or development activities. Many did not and will not survive.

According to the EIU/Deloitte survey, more than 65 percent of respondents indicated that their company has been moderately to significantly negatively affected by the recent global recession. More than half of respondents also adopted a “this too shall pass” attitude, stating that the recession will have a moderate or only temporary impact on the fundamental restructuring of the industry that was already under way. Fully 50 percent indicate that changes to their overarching strategy pre-recession will be minor.

However, a significant minority of 17 percent of respondents say that the recession will cause major changes to their pre-recession strategy. On close examination of the data, the companies affected most significantly are the more entrepreneurial ventures and start-ups, precisely the companies that the larger players have used to help them drive innovation. The biotech community — in the United States, Europe, and Asia — is struggling mightily and appears to be in survival mode. Scientific talent, which historically was able to find seed capital necessary to form start-ups, appears to be flocking back to the “safe ports in the storm,” that is, the better-capitalized, larger-scale competitors.
The sales revenue pinch
Just over half (51 percent) of survey respondents report a downturn in sales revenue as a result of the recession. Although there is an expectation that medical products are still required even in a recession — and that volume at least would remain stable — this appears not to be the case. Twenty-seven percent note a decline in product volume and 23 percent acknowledge a fall in pricing, with the service provider segments of the industry showing particular declines. These results are surprising, especially on the volume side of the equation.

Downward pricing pressure was a fact of life prior to the recession and it has clearly intensified. Global health systems, whether governments, private insurers or provider organizations, are aggressively seeking ways of reducing costs, driving continued pressure on drugs and medical devices. In addition to hard-nosed negotiating, health plans are leveraging the potential of generic drugs and new tools such as comparative effectiveness, forcing manufacturers to justify the value of their products in terms of patient outcomes.

Comparative effectiveness, pioneered by organizations like the National Institute for Health and Clinical Excellence (NICE) in the United Kingdom and included in the recently passed healthcare reform legislation in the United States — albeit at the back end of the legislation’s implementation cycle — is increasingly being used to ensure value for money and to put pressure on pharmaceutical and device prices. Amit Roy, head of healthcare research equities at Nomura Securities, a Japanese securities and investment banking company, says, “During 2009, cash-strapped governments and insurers in developed world markets increased efforts to rein in medical expenditures by looking into introducing more rigorous assessment procedures to ensure that approved technologies generate value for money.”

From a geographic standpoint, nearly 60 percent of North American respondents say that the recession affected their sales revenue compared with 47 percent and 40 percent in Western Europe and Asia-Pacific, respectively. Many of the respondents from Asia-Pacific indicated that their companies are still in a growth mode as the life sciences markets develop and companies drive to increase market share. The 11 percent gap between North American and Western European respondents may be a reflection of the relative importance of biotechnology and services in the North American market and the degree to which these sectors have been affected.
Biotechnology and start-ups: capital starved

The recession has wreaked particular havoc on the biotechnology sector. The virtual collapse of global capital markets, particularly the pull-back of venture capital and private equity, has had an immediate and significant impact, especially in the area of start-ups or any of the more entrepreneurial ventures in the sector. Two-thirds (66 percent) of biotech executives say that access to capital was hit hard, particularly angel investment, venture-capital funding, and equity financing. As the initial public offering (IPO) market has also dried up, those firms that have the available funds are reluctant to invest given the absence of any certain value-capture exit strategy. Dan Zabrowski, global head of pharmaceuticals partnering at Roche, says, "Venture-capital financing of biotechnology has decreased radically because investors are no longer certain they will be able to exit through an IPO or sale. In the absence of this flow of funds, a vast number of biotech firms face bankruptcy."

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<th>Geographic area</th>
<th>Percentage of respondents who say the recession has affected revenue</th>
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<td>Western Europe</td>
<td>47</td>
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<td>Asia-Pacific</td>
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<td>Middle East and Africa</td>
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Echoing Zabrowski’s point, when asked what proportion of the biotechnology sector, in terms of numbers of organizations, is likely to disappear as a result of the global recession, 44 percent of all respondents say that 20-40 percent of biotech firms are likely to fail. Worryingly, 68 percent of biotech executives surveyed agree. Seventy-four percent of biotech executives also note that the recession has led to a slowdown in biotech start-ups. This trend appears to have affected Europe dramatically, given funding issues for biotechnology even prior to the recession. According to the European Biopharmaceutical Enterprises (EBE), a trade entity that represents the interests of both large pharmaceutical companies and smaller biotech firms, the percentage of European firms facing extinction could be much higher if the financial crisis lasts much longer. The EBE’s executive director, Emmanuel Chantelot, says, “The European biotech sector has been hit especially hard, because in general there is less venture-capital funding available than in the United States. Small biotechs are especially cash-consuming, as they do not yet have revenue-generating capacity.”

In the country in which you are based, which of the following are occurring in the biotechnology sector as a result of the global recession? (Respondents selected all that applied. % of biotech executives.)

- Slowdown in the formation of biotech start-ups: 74%
- The biotech industry’s R&D cost base has been slashed: 45%
- Significant increase in acquisitions of smaller biotech firms by larger biotech companies: 32%
- Talented research scientists are leaving biotech and returning to big pharma: 29%
- Increase in public-private partnerships: 26%
- Biotech researchers becoming more market-oriented and less focused on basic research: 24%
- Governments enacting policies to foster innovation in life sciences: 24%
- Significant increase in acquisitions of biotech firms by pharma companies: 18%
- Tougher reimbursement rules for biotech products: 18%
- Withdrawal of government tax concessions to the biotech sector: 5%
- Regulatory reform of financial markets to stimulate funding of biotech: 5%
- Biotech acquisition by government: 3%
- Don’t know: 5%
Is selling generics easy business?

It would be logical to assume that in an economic downturn, generic drugs manufacturers would thrive. The desire of payers to cut costs ought to play to the strengths of generics, driving the lower-cost substitution for the high-priced branded product. That is the theory, at least. In practice, it would appear there is far more to the business.

Eyal Desheh, the chief financial officer (CFO) of Israeli-based Teva — the world’s biggest generic drug manufacturer, with 75 percent of its US$11 billion-plus revenue in off-patent products — says the generics business is very different from other life sciences segments.

To begin with, the scale of the generics market in any given country is not solely determined by the cost pressures felt within the market, but by that country’s regulatory environment. The 1984 Hatch-Waxman Act, which liberalized the regulation of generics in the United States, in effect created today’s US$59 billion market there. Pharmacists in the United States are required to change branded prescriptions to generics when filling a prescription unless the branded product is explicitly indicated. Conversely, in Japan, for example, a presumption still exists that generic products are inferior and exactly the opposite is the case; a pharmacist may only dispense a generic product if it is specified in the prescription. Thus, where legislation does not favor generics, there are no measurable shifts in sales to generics even in a downturn.

The generics industry is also highly competitive. Just a decade ago, the industry comprised a multitude of small companies. Several rounds of consolidation have led to a handful of big players, however. These players also compete within the generics market, driving down price in the segment itself. Unless manufacturers are alert to fluctuating market prices, they will lose out on market share.

As Teva illustrates, it is possible to amass a respectable fortune out of generics. Teva’s net sales of US$3.9 billion in the quarter ending on 31 December 2009 were 25 percent higher year-on-year. However, Desheh says the reason is that his company “invests more of its revenue back into the development of new generics than any other company around…and Teva always expects to be the first to file a new generics application with the United States Food and Drug Administration. Teva’s product portfolio of more than 400 drugs makes it bigger than the next three competitors combined.”
Looking to survive

According to survey results, consolidation and cost-cutting are two ways companies are looking to survive the downturn. Despite tight credit markets, consolidation allows those players with strong balance sheets to expand their portfolio and position themselves for the future. And though the pace is slower, the M&A trend that began before the recession is expected to continue.

Even more pressing, however, are cost-cutting efforts, with life sciences executives responding quickly to declining sales volume and pricing pressure. Many of the major companies had ambitious cost-reduction programs in place before the recession, and these went into overdrive as they sought to wring out further savings. Other companies that had been less focused on cost reduction initiated programs of their own in response to the worsening economy. During 2009 the top-ten major global pharmaceuticals manufacturers announced layoffs in excess of 60,000 people. Sales and marketing were the main targets for these headcount reductions, but operations and overhead areas have also been fair game. Paradoxically, a number of organizations that participated in the survey aggressively cut research and development activity, even though they recognize that R&D is critical to their longer-term success. Perhaps in keeping with John Maynard Keynes’ sentiment that “in the long run, we’re all dead,” cutting to survive today at least ensures the opportunity to address the R&D problem in the future.

Consolidation

The three major transactions of 2009 — Merck/Schering-Plough, Pfizer/Wyeth, and Roche/Genentech — were all initiated prior to the turmoil of late 2008. The recession may have complicated the completion of these deals, but they were driven by underlying industry fundamentals, according to 76 percent of survey respondents, rather than expediency of the recession.

The recession actually seems to have cooled merger and acquisition (M&A) fever, at least in the short term. Only 17 percent of survey respondents say that their companies have increased acquisition activity as a result of the recession. There seem to be several reasons for the decline in acquisitions. First (and most obviously), the dwindling credit market has impeded the ability of even well-capitalized companies to finance deals. Traditional capital sources have generally become unavailable. Companies with balance sheets to support acquisitions have resorted to tapping the public markets directly. Roche, for example, ultimately resorted to three separate bond tranches to finance the Genentech transaction — a U.S. issue, a European issue, and a Swiss issue. Even if companies manage to finance their transactions, they are often faced with higher financing costs.

Second, despite smaller companies being under stress, there is little evidence of a “fire sale” environment at this time. Larger players engaging in transactions are being strategic rather than opportunistic and are acquiring companies that fit within their portfolio or are new platform plays for the future. For example, there have been a spate of deals in the diagnostics area as pharmaceuticals companies acquire biomarkers that align with their drugs portfolios. RNAi (RNA interference) also continues to be a hot area for transaction activity.
However, there are indications that investors have not totally adjusted their expectations to the realities of the new market environment. According to Pete Mooney, Deloitte’s Global Life Sciences and Health Care Consulting Leader, “In general, investors are overvaluing what they have from the perspective of today’s markets and there is a real miss-match between what acquirers are willing to pay and what investors would like to be paid.”

The post-recessionary perspective seems to be very different. While the debate about economies of scale in the industry still rages, 26 percent of respondents believe that by 2015 the pharmaceuticals sector will be dominated by a handful of global players. Nearly 40 percent indicated that the consolidation trend has been accelerated by the recession. Daiichi Sankyo’s acquisition of Ranbaxy, the general global acquisitiveness of the Japanese pharmaceuticals sector, Novartis’ pending acquisition of the remainder of Alcon and other activity would seem to indicate that many of the big players’ ardor for consolidation has not been quenched.

Cost-cutting

More than half of survey respondents indicated that they had cost-cutting activities under way prior to the recession (58 percent), with the main focus on the rationalization of supply chains (35 percent) and consolidation of offices and disposal of non-core assets (31 percent).

The figure for sales force reduction (17 percent) is initially puzzling, particularly in light of the high-profile sales cuts announced throughout 2009 by the major pharmaceutical manufacturers. In looking deeper into the data, this can be explained by the mix of survey respondents, many of whom represent smaller companies and businesses in segments other than big pharma. These segments tended to be less aggressive in reducing their sales force pre-recession and are now stepping up reductions in this area.

Cost-cutting efforts support the acceleration of a productivity trend that existed pre-recession, but which is likely to continue in earnest post-recession. Indeed, 61 percent of life sciences executives say their companies have either stepped up or initiated cost-cutting efforts in response to the downturn. The industry appears to finally be adopting many of the cost-management and continuous improvement tools which other manufacturing segments have employed for years. Lean, Six Sigma, and other cost-effectiveness programs are now prevalent in the industry.

If your organization has recently undertaken (or is planning) a cost-cutting exercise, in which areas have they been focused? (% of all respondents.)

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<th>Area</th>
<th>Instituted before the recession</th>
<th>Instituted after the recession</th>
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<td>Headcount reductions focused in specific areas</td>
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<td>Headcount reductions throughout the organization</td>
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<td>32</td>
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<tr>
<td>Reduction in R&amp;D investment</td>
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<td>31</td>
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<tr>
<td>Consolidation of offices and disposition of non-core assets</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Supply-chain rationalization, supplier consolidation, and cost reduction</td>
<td>35</td>
<td>28</td>
</tr>
<tr>
<td>Sales force reductions</td>
<td>17</td>
<td>23</td>
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<tr>
<td>Increasing outsourcing activity</td>
<td>29</td>
<td>21</td>
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<tr>
<td>Manufacturing asset closure &amp; consolidation</td>
<td>17</td>
<td>18</td>
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<tr>
<td>Involvement in a merger or acquisition aimed at achieving cost synergy/economies of scale</td>
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During and post-recession, though, the areas selected for attrition have shifted toward headcount reductions, which provides more rapid payback than supply-chain rationalization, asset restructuring, or outsourcing. Post-recession, 32 percent of respondents say that their companies have reduced headcount throughout the organization and 41 percent say they have initiated headcount reductions in specific areas. This contrasts with 26 percent and 25 percent, respectively, pre-recession.

According to survey results, the recession’s effect on headcount reductions has been most strongly felt in the pharma R&D, medical device, and distribution areas, as nearly one-third of these companies have instituted headcount reductions as a result of the recession. From a geographic standpoint, most of the workforce reductions are taking place in the United States and Europe, where the recession has been most severe. Emerging markets have escaped this action, as they continue to be an investment area. In addition, some of these companies may have had skeleton workforces in the area, so reducing headcount was not an option.

### Percentage of respondents that stated their company was reducing headcount as a result of the recession

**By segment.**

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<th>Industry</th>
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<td>Pharmaceutical R&amp;D</td>
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<td>Medical devices</td>
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<td>Distribution</td>
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<tr>
<td>Pharmaceutical: manufacturing</td>
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<td>Biotechnology</td>
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<td>Contract research</td>
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<td>Healthcare services</td>
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### Percentage of respondents that stated their company was reducing headcount as a result of the recession

**By geographic area.**

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<td>Asia Pacific</td>
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How important are emerging markets?

Well before the recession took hold, life sciences companies were focusing on geographic expansion — and the BRIC (Brazil, Russia, India and China, as coined by Goldman Sachs in 2001) markets, in particular. Thirty-two percent of survey respondents say they plan to accelerate geographic diversification post-recession. In addition, 35 percent of respondents say that one of the main legacies of the recession on the size and shape of life sciences industries in the next five years will be the rise of emerging markets as profitable areas in which to operate.

In July 2009 Sanofi-aventis made a presentation to investors about its long-term commitment to move into emerging markets in which it outlined the rationale of its strategy. It stated that while China, India, Brazil, Russia, Mexico, and Turkey represent 45 percent of the world’s population, they account for only some 10 percent of global prescription drugs sales. As these economies grow more prosperous, chronic disease — and demand for highly lucrative drugs that treat them — are expected to increase. Emerging nations should be among the fastest-growing life sciences market worldwide in the future. Sanofi-aventis, which has a large portfolio of prescription brands, over-the-counter products, generics, and vaccines, is positioning itself to take advantage of that opportunity by increasing its focus on these markets.

But emerging markets are not a sure bet. The Economist’s 1 October 2009 “Special Report on the World Economy” observed that to reap the benefits of the new wealth of emerging nations, companies will first have to persuade thrifty individuals in these markets to spend more and save less. Stefano Pessina, executive chairman of Alliance Boots, a European retail pharmacy and pharmaceutical wholesaler, says, “Alliance Boots is in China collaborating with state-owned partners in wholesaling. The relationship works well and the business is growing well overall. China’s healthcare spend is steadily rising by 8-9 percent a year. But this is largely due to state investment and is not led by the private citizen, who spends very little.”

Also, taking products designed for Western markets and merely trying to sell them in developing countries can be a recipe for disaster. Markets are different and local R&D matters. Sanofi-aventis is de-emphasizing its global brand in developing markets, preferring to go to market under a series of sub-brands with local meaning. The company is also working hard to drive local R&D activities, so that products are specifically aimed for the local populations. General Electric is also driving local product development in the medical devices space. It calls its process reverse innovation compared with its traditional approach, which the company labeled globalization. Products like hand-held ECG devices and PC-based ultrasound were developed in India, specifically for the Indian market, and are now being back-streamed to GE’s developed world markets.

The largest companies are most likely to be making headcount reductions as a result of the recession. Fully 48 percent of respondents in companies with revenue over US$15 billion reported headcount reductions. This contrasts with companies of less than US$1 billion in revenue, where less than 10 percent indicated headcount reductions. According to Nomura Securities’ Roy, the reductions in personnel have actually been going on for at least three years. Some large life sciences companies are in their third round of workforce reductions, he says. Roy notes, however, that headcount reductions are far from over. He estimates that a further 15 percent of personnel could be laid off by 2012.

Indeed, in November 2009 Johnson & Johnson announced it would cut its workforce by 6 to 7 percent, that is, about 8,000 people. On the same day Merck completed its US$41 billion takeover of Schering-Plough. According to market analysts, the Merck/Schering-Plough merger could result in a further 16,000 job losses, 15 percent of the combined workforce. The story is similar at Pfizer, which acquired Wyeth in October 2009. In total, the top ten pharmaceuticals manufacturers reduced their workforce by more than 60,000 people in 2009. And at the end of January 2010 AstraZeneca (AZ) unveiled its plans to cut another 8,000 jobs by 2014, in addition to the 15,000 already announced. Many of AZ’s losses will be made in R&D, as the company intends to take US$1 billion out of its R&D budget by 2014.

<table>
<thead>
<tr>
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</tbody>
</table>

How important are emerging markets?

Well before the recession took hold, life sciences companies were focusing on geographic expansion — and the BRIC (Brazil, Russia, India and China, as coined by Goldman Sachs in 2001) markets, in particular. Thirty-two percent of survey respondents say they plan to accelerate geographic diversification post-recession. In addition, 35 percent of respondents say that one of the main legacies of the recession on the size and shape of life sciences industries in the next five years will be the rise of emerging markets as profitable areas in which to operate.

In July 2009 Sanofi-aventis made a presentation to investors about its long-term commitment to move into emerging markets in which it outlined the rationale of its strategy. It stated that while China, India, Brazil, Russia, Mexico, and Turkey represent 45 percent of the world’s population, they account for only some 10 percent of global prescription drugs sales. As these economies grow more prosperous, chronic disease — and demand for highly lucrative drugs that treat them — are expected to increase. Emerging nations should be among the fastest-growing life sciences market worldwide in the future. Sanofi-aventis, which has a large portfolio of prescription brands, over-the-counter products, generics, and vaccines, is positioning itself to take advantage of that opportunity by increasing its focus on these markets.

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This recession clearly holds enormous implications for the future of innovation. With R&D the victim of cost-cutting measures and biotech start-ups foundering due to lack of financing, intellectual capital may start drying up — posing a threat to innovation throughout the industry.

**An R&D paradox**
A puzzling, and important, aspect of the survey concerned R&D. When asked which strategies would be important for longer-term success, most survey respondents seemed to recognize that cost-cutting, while expedient, was not the path to sustained success. Indeed, for those companies where R&D activities are relevant (that is, excluding services companies and distributors), a full 30 percent of respondents say that developing a robust R&D pipeline is important to their longer-term success. Similarly, 21 percent say that forming alliances and partnerships for R&D purposes is important for their future. Overall, 30 percent of respondents indicated that the winning companies post-recession will be those that refocus on innovation. More than half (54 percent) of all the respondents indicated that large companies will continue to expand the number of joint ventures/alliances/outsourced R&D agreements they had in place.

### Which of the following strategies will be the most important in securing your company’s future success?

(\% of respondents, excluding services and distributors.)

- Developing a robust R&D pipeline: 30\%
- Forming alliances and/or partnerships with pharma/biotech/medical device firms: 21\%
- Developing a closer relationship with our customers: 12\%
- Acquiring strategic businesses: 11\%
- Recruiting and retaining top-tier managers and scientists: 8\%
- Fueling growth of core businesses with volume and price increases: 5\%
- Streamlining and shortening the commercialization process: 5\%
- Cutting operating costs: 3\%
- Focusing on in-house product discovery: 2\%
- Developing information networks (e.g., data on patients’ profiles): 2\%
- Improving the company’s ethical and financial reputation: 1\%
The paradox is this: fully 32 percent of survey respondents indicated that they were reducing their R&D spend in light of the recession and 43 percent said that they were focusing on products that would provide a more immediate return. These figures are slightly higher (35 and 46 percent, respectively), when excluding the responses from distributors health care services and companies.

The results are more acute in the biotechnology segment, where 58 percent of respondents say the recession has led to a reduction in R&D spend. In fact, according to 45 percent of the biotech executives surveyed, “the biotech industry’s R&D cost base has been slashed,” with 74 percent saying there has been a slowdown in biotech start-ups as a consequence of the recession. Dan Zabrowski, who is responsible for partnering at Roche, including activities with biotechnology, is concerned about the reductions in R&D spend and the slowdown in start-ups: “We usually see a lot of innovation coming from more entrepreneurial ventures and smaller biotech. With this source of intellectual capital drying up, we are concerned there will be a significant impact on overall industry innovation.”

Respondents stating which activities were most important regarding R&D in light of the global recession
(\% of respondents, excluding services and distributors.)

- Greater focus on products that are likely to provide a more immediate return: 46\%
- Reduction in total R&D spend: 35\%
- Expansion of R&D partnerships/networks with other firms: 28\%
- Reduction in R&D overheads: 20\%
- Expansion of the number of collaborations with non-profits/academic community: 17\%
- Increased offshore R&D and/or clinical activities: 17\%
- Increase in other outsourced research and/or development activities: 16\%
- Reduction in the number of compounds in the R&D pipeline: 15\%
- Increase in number of outsourced clinical trials: 14\%
- Acquisition of more R&D-oriented firms: 13\%
- Increase in the number of compounds in the R&D pipeline: 7\%
- Other: 2\%
- Don’t know: 8\%
Yet innovation is not an on/off switch. Says Pete Mooney of Deloitte: “Achieving innovative breakthroughs requires a sustained investment in R&D spending. When you cut R&D spend short term, you are dismantling the innovation engine. This can take years to rebuild.”

It appears that two things are occurring. The first, to a degree, is desperation. Smaller companies with limited capitalization, many in early stages and pre-launch, appear to be cutting or slowing their R&D spending because they have no other choice. It is a survival issue and, as previously indicated, many will not make it.

The second, which seems to be occurring in larger companies in the segment, is more subtle. Eighty-one percent of respondents in companies with revenue of more than US$1 billion indicated that restructuring their R&D organization to improve their internal product pipeline was a critical or very important strategy for future success. This contrasts with 74 percent indicating this same level of importance pre-recession. Apparently, one of the lessons of the recession is that the industry will need to learn to do more with less as far as R&D is concerned.

How do you believe the R&D function for pharmaceutical companies has changed in response to the negative economic climate? (Respondents selected up to three. % of respondents, excluding services and distributors.)

- Scientists are/will flock from small to larger companies: 34%
- Scientists are/will flock from larger to smaller companies: 12%
- Smaller companies will be the main source for innovation and new products: 40%
- Larger companies will be the main source for innovation and new products: 22%
- Larger companies will continue to expand the number of joint ventures/alliances and outsourced R&D agreements: 60%
- Larger companies will materially decrease the number of joint ventures/alliances and outsourced R&D agreements: 10%
- Smaller companies will continue to expand the number of joint ventures/alliances and outsourced R&D agreements: 26%
- Smaller companies will materially decrease the number of joint ventures/alliances and outsourced R&D agreements: 9%
The demise of biotech as we know it?

Biotechnology has always differed from mainstream pharmaceuticals, not only because its methods of innovation and output are so different. Historically, because the science was new, the development cycle long, and the market for any potential drugs uncertain, biotechnology lent itself to the more entrepreneurial. The sector depended on venture capital, private equity, or corporate equity infusions to fund research, often without a revenue stream. It is fair to say that as a result of the current recession and the collapse of the capital markets, the fortunes of the biotech sector have declined to an all-time low.

Consequently, the blurry line between a pharmaceuticals company, a biopharmaceuticals company and a biotechnology company is about to become blurrier. Biotech companies such as Amgen have recently started small molecule research organizations. In late 2008, Merck created a division called Merck BioVentures, focused on bringing biologics research in-house. One consequence of Roche’s acquisition of Genentech is that in June 2009 the company resigned from PhRMA (the U.S. pharmaceuticals manufacturing association) and the ABPI (the Association of the British Pharmaceuticals Industry), instead affiliating more closely with BIO (the Biotech Industry Organization). Roche clearly no longer defines itself as a pharmaceuticals company.

Where does the talent go when it can no longer raise the capital to form its own enterprise? Larger, better-capitalized companies are the “safe port in the storm” and are taking advantage of the downturn to acquire first-rate talent. Nearly one-third of survey respondents agree that scientists will flock from smaller companies to larger ones as a result of the recession.
Recovery of the capital markets will be critical if an entrepreneurial mindset is to return to the industry. The European Pharmaceutical Enterprise’s (EBE) executive director, Emmanuel Chantelot, warns, “It is very important to ensure that venture-capital companies continue to operate for the health of the biotechnology sector.”

But most industry observers believe it will be a number of years before the capital markets recover to a level that funds start to flow back into entrepreneurial life sciences. Even then, investors burned by the events of 2008-2009 may have a more guarded perception of risk and return. This does not bode well for start-ups and more entrepreneurial biotech companies.

The importance of sustaining R&D
Whether alliances prove to be the new model for R&D or not, one factor remains certain. Innovation cannot be turned off and on as new products are required. According to survey respondents, companies that have maintained their R&D efforts are in better shape than those that have cut back their R&D, seeking a short-term respite. Fewer companies that have retained their R&D investments report reductions in head count, reductions to their sales forces and manufacturing, assets closures, and consolidation (see table below).

The development of a robust R&D pipeline is the number-one strategy to achieve success through 2015, according to survey respondents. “Everything hinges on R&D productivity. The optimist would say that it is possible that science might catch up and industry may begin to capitalize on the breakthroughs made in genetics and biologics over the last decade,” says Patricia Danzon, professor of health care management at the University of Pennsylvania’s Wharton School of Business. “The pessimist would have innovative R&D as being so complex that the long-promised golden age is a long time in coming, and all the while payers continue to cut back. But all this means is that the future of the life sciences industry depends more on the state of science than it does on the state of the economy.”

### Strategies instituted since the global recession

<table>
<thead>
<tr>
<th>Strategies instituted since the global recession</th>
<th>Percentage of responses among companies that have cut back R&amp;D spend pre- or post-recession</th>
<th>Percentage of responses among companies that have not instituted cutbacks in R&amp;D spend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiated a cost-reduction effort when the recession hit</td>
<td>34</td>
<td>24</td>
</tr>
<tr>
<td>Reduced headcount across the organization</td>
<td>41</td>
<td>23</td>
</tr>
<tr>
<td>Reduced headcount in specific areas</td>
<td>56</td>
<td>29</td>
</tr>
<tr>
<td>Manufacturing asset closure &amp; consolidation</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>Reductions in sales forces</td>
<td>30</td>
<td>18</td>
</tr>
</tbody>
</table>
Are the effects of the global recession fundamentally altering the future environment of the life sciences industries and are companies adjusting their strategies to adapt? It is perhaps too early to tell. It is clear that the recession has had considerable impact on the industry. While not manifesting itself in high-profile bankruptcies or government bailouts, a sizeable proportion of industry participants have been dramatically affected. Even those players who remain secure in their strategic direction will need to rethink some basic assumptions as the future becomes clearer in the aftermath of the recession.

The life sciences marketplace was in flux before autumn 2008. The recession has accelerated many of the underlying trends, and increased the rate of change in the industry. The transformation of healthcare, use of tools such as comparative effectiveness, increased penetration of generic products and the permissibility of biosimilar products, for example, were all under way pre-recession. And as industry margins continue to feel pressure, it is likely that the time horizon has become compressed.

A new and unanticipated dynamic has been caused by the capital markets crisis, and may fundamentally alter the future of the industry for at least a generation. The scarcity of capital, particularly of the entrepreneurial sort offered by venture capitalists and private equity, will be a legacy of the recession and will be slow to recover. Even when availability eases, investors’ perceptions of risk have been reset and costs will be higher — and expectations of returns greater. This will have a chilling effect on the more entrepreneurial side of the life sciences marketplace, which has been the source of much of the industry’s innovation over the last 10 to 15 years. A great irony revealed in the survey is that most of the respondents indicated that innovation was the life blood of the industry and predicted that companies that sustained their investment and focus in R&D would be the eventual winners in the future. At the same time, a sizeable percentage of respondents indicated that they were aggressively cutting their R&D spend.

This paradox may indicate two things. On the one hand, larger competitors, particularly in the pharmaceuticals sector, have begun to understand that they need to restructure their R&D organizations to enhance productivity. These companies appear to be trying to do more with less. On the other hand, smaller companies appear to be in survival mode. They may understand that cutting R&D will adversely affect long-term success, but are really only worried about short-term survival.

The big, longer-term impact of the recession may be a shifting of the industry’s “balance of innovation.” It appears that scientific talent is moving back to larger organizations. Capital for start-up ventures does not exist as it did in the past. Traditional biotechs are failing at an alarming rate, and the more mainstream pharmaceutical companies have recognized the value of large molecule research. These larger enterprises have access to what capital is out there and are investing in proven technologies like monoclonal antibody and new platform plays such as RNAi.

A legacy of the recession may be that traditional biotech, particularly as it is perceived as an engine for industry innovation, may be fading into the background. The distinction between a biotech and a pharmaceutical company may not exist in the future. The big may get bigger, as those with the financial wherewithal to consolidate the industry do so. Margin pressure, commoditization of many products, capital shortages, and acute short-term financial need all argue for continued consolidation among the largest players.
Survey results: 2009 online survey of 281 senior life sciences industry executives, conducted by the EIU in collaboration with the DTT LSHC Industry Group.

To what extent has your organization been affected by the global economic recession?

<table>
<thead>
<tr>
<th>Effect</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant positive effect</td>
<td>2%</td>
</tr>
<tr>
<td>Moderate positive effect</td>
<td>6%</td>
</tr>
<tr>
<td>Neutral</td>
<td>25%</td>
</tr>
<tr>
<td>Moderate negative effect</td>
<td>52%</td>
</tr>
<tr>
<td>Significant negative effect</td>
<td>14%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1%</td>
</tr>
</tbody>
</table>

Which areas of your business have been most affected by the global economic recession? (Respondents selected up to three.)

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue, in general</td>
<td>51%</td>
</tr>
<tr>
<td>Volume</td>
<td>27%</td>
</tr>
<tr>
<td>Pricing</td>
<td>23%</td>
</tr>
<tr>
<td>Cash flow</td>
<td>22%</td>
</tr>
<tr>
<td>Ability to finance initiatives</td>
<td>21%</td>
</tr>
<tr>
<td>Headcount</td>
<td>20%</td>
</tr>
<tr>
<td>Investment in research and development (R&amp;D)</td>
<td>16%</td>
</tr>
<tr>
<td>Marketing and selling costs</td>
<td>10%</td>
</tr>
<tr>
<td>Raw materials costs</td>
<td>10%</td>
</tr>
<tr>
<td>Investment in mergers and acquisitions (M&amp;A)</td>
<td>10%</td>
</tr>
<tr>
<td>Other growth initiatives</td>
<td>9%</td>
</tr>
<tr>
<td>Cost of regulatory compliance</td>
<td>6%</td>
</tr>
<tr>
<td>Investment in geographic expansion</td>
<td>6%</td>
</tr>
<tr>
<td>Direct/Manufacturing costs</td>
<td>5%</td>
</tr>
<tr>
<td>Options programs</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>5%</td>
</tr>
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</table>
In your opinion, which of the following statements are most accurate for the life sciences industry? (Respondents selected up to three.)

- Created greater uncertainty and increased risk aversion: 52%
- Reduced access to capital necessary for business investment: 48%
- Created new opportunities for M&A, since many smaller companies are financially stressed: 47%
- Accelerated the mandate for health care reform in many countries: 33%
- Increased the willingness of large companies to outsource: 32%
- Made it easier for large organizations to attract scientific talent that would have historically gone to smaller organizations or start-ups: 20%
- Increased the regulatory burden and caused a higher level of government involvement: 17%
- Increased trade barriers and protectionism, making it more difficult to do business globally: 9%
- Accelerated the mandate for corporate tax reform in many countries: 6%
- Enabled smaller companies to take advantage of currency fluctuations: 5%

To what extent have the following areas within the life sciences industries been affected by the global economic recession?

- Biotechnology
  - Significant positive effect: 3%
  - Moderate positive effect: 11%
  - Neutral: 36%
  - Moderate negative effect: 31%
  - Significant negative effect: 19%
- Pharma wholesale/retail
  - Significant positive effect: 2%
  - Moderate positive effect: 7%
  - Neutral: 38%
  - Moderate negative effect: 47%
  - Significant negative effect: 6%
- Pharma manufacturing
  - Significant positive effect: 2%
  - Moderate positive effect: 7%
  - Neutral: 43%
  - Moderate negative effect: 42%
  - Significant negative effect: 6%
- Contract research organizations (CROs)
  - Significant positive effect: 3%
  - Moderate positive effect: 10%
  - Neutral: 34%
  - Moderate negative effect: 39%
  - Significant negative effect: 14%
- Distribution
  - Significant positive effect: 3%
  - Moderate positive effect: 5%
  - Neutral: 48%
  - Moderate negative effect: 40%
  - Significant negative effect: 4%
- Health care services
  - Significant positive effect: 4%
  - Moderate positive effect: 10%
  - Neutral: 46%
  - Moderate negative effect: 32%
  - Significant negative effect: 8%
- Pharma R&D
  - Significant positive effect: 3%
  - Moderate positive effect: 7%
  - Neutral: 29%
  - Moderate negative effect: 48%
  - Significant negative effect: 13%
- Medical devices
  - Significant positive effect: 2%
  - Moderate positive effect: 8%
  - Neutral: 37%
  - Moderate negative effect: 45%
  - Significant negative effect: 8%
After the global economic recession ends, which type of company is likely to emerge as the winner?

- Companies that have refocused their attention on innovation: 30%
- Life sciences companies that work closely with consumers: 13%
- Lean pharma firms with lower margins but large product portfolios: 13%
- Diversified companies: 12%
- Biotech companies that survive the recession: 10%
- Companies that have increased their globalization of major markets: 9%
- Companies that have shifted most of their investments into emerging markets: 7%
- Other: 3%
- Don’t know: 3%

In the country in which you are based, which of the following are occurring in the biotechnology sector as a result of the global recession?

(Respondents selected all that applied.)

- Slowdown in the formation of biotech start-ups: 59%
- The biotech industry’s R&D cost base has been slashed: 35%
- Significant increase in acquisitions of biotech firms by pharma companies: 26%
- Biotech researchers becoming more market-oriented and less focused on basic research: 23%
- Significant increase in acquisitions of smaller biotech firms by larger biotech companies: 19%
- Governments enacting policies to foster innovation in life sciences: 18%
- Tougher reimbursement rules for biotech products: 17%
- Talented research scientists are leaving biotech and returning to big pharma: 16%
- Increase in public-private partnerships: 15%
- Regulatory reform of financial markets to stimulate funding of biotech: 6%
- Withdrawal of government tax concessions to the biotech sector: 6%
- Biotech acquisition by government: 4%
- Other: 1%
- None of the above: 4%
- Don’t know: 11%
Many biotechnology companies require ready access to cash to survive, but with the global economic recession, the availability of ready money has been curtailed. Which areas of biotech financing do you believe have been hit hardest?

(Respondents selected up to three.)

<table>
<thead>
<tr>
<th>Financing Method</th>
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<td>Venture capital</td>
<td>51%</td>
</tr>
<tr>
<td>Debt financing</td>
<td>40%</td>
</tr>
<tr>
<td>Private or angel investment</td>
<td>34%</td>
</tr>
<tr>
<td>Equity financing</td>
<td>33%</td>
</tr>
<tr>
<td>Private endowments</td>
<td>23%</td>
</tr>
<tr>
<td>Government grants</td>
<td>16%</td>
</tr>
<tr>
<td>R&amp;D limited partnerships</td>
<td>12%</td>
</tr>
<tr>
<td>Contractual joint ventures</td>
<td>6%</td>
</tr>
<tr>
<td>Government tax concessions</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>12%</td>
</tr>
</tbody>
</table>

In your estimation, approximately what proportion of the biotech sector (in terms of number of organizations) is likely to disappear as a result of the global economic recession?

<table>
<thead>
<tr>
<th>Proportion of Companies</th>
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<tbody>
<tr>
<td>Less than 20%</td>
<td>33%</td>
</tr>
<tr>
<td>Between 20% and 40%</td>
<td>44%</td>
</tr>
<tr>
<td>Between 41% and 60%</td>
<td>9%</td>
</tr>
<tr>
<td>Between 61% and 80%</td>
<td>3%</td>
</tr>
<tr>
<td>More than 80%</td>
<td>0%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>11%</td>
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</tbody>
</table>
Please select one word from each list below to complete the sentence with the most appropriate answers: “The global recession has had (one from list A) and (one from list B) impact on the fundamental re-structuring occurring in the life sciences industry.”

**List A**
- Limited: 19%
- Moderate: 55%
- Significant: 22%
- Don’t know: 4%

**List B**
- Temporary: 58%
- Permanent: 31%
- Don’t know: 11%
What will be the main legacies of the global economic recession on the size and shape of the life sciences industries in the next five years?
(Respondents selected up to two.)

Emerging markets will become the most profitable geographic areas for life sciences 35%
The industries will be more globalized 32%
The life sciences industries will be dominated by a handful of players 26%
Barriers to entry in life sciences will accelerate 17%
Big pharma will have transferred most of its R&D to other companies 16%
The biotech sector will be largely subsumed into the rest of the life sciences industries 16%
There will be a reduction in the number of vertically integrated companies, and an increased level of company specialization 16%
R&D output from big pharma will increase 10%
Other 1%
Don’t know 4%

Has your organization initiated a major cost-reduction effort in response to the global economic recession?

Had a cost-reduction effort under way before the recession, and we scaled up the effort as the economy worsened 33%
Initiated a cost-reduction effort when the recession hit 28%
Had a cost-reduction effort under way before the recession and we have proceeded to plan 25%
Do not have a cost-reduction effort 12%
Don’t know 2%
If your organization has recently undertaken (or is planning) a cost-cutting exercise, in which areas have they been focused? (Respondents selected one per column.)

<table>
<thead>
<tr>
<th>Area</th>
<th>Instituted prior to onset of recession at end-2008</th>
<th>Instituted after recession hit at end-2008</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount reductions throughout the organization</td>
<td>26%</td>
<td>32%</td>
<td>42%</td>
</tr>
<tr>
<td>Headcount reductions focused in specific areas</td>
<td>25%</td>
<td>41%</td>
<td>34%</td>
</tr>
<tr>
<td>Manufacturing asset closure &amp; consolidation</td>
<td>17%</td>
<td>18%</td>
<td>65%</td>
</tr>
<tr>
<td>Sales force reductions</td>
<td>17%</td>
<td>23%</td>
<td>60%</td>
</tr>
<tr>
<td>Reduction in R&amp;D investment</td>
<td>14%</td>
<td>31%</td>
<td>55%</td>
</tr>
<tr>
<td>Consolidation of offices and disposition of non-core assets</td>
<td>17%</td>
<td>23%</td>
<td>60%</td>
</tr>
<tr>
<td>Supply-chain rationalization, supplier consolidation and cost reduction</td>
<td>17%</td>
<td>23%</td>
<td>60%</td>
</tr>
<tr>
<td>Increasing outsourcing activity</td>
<td>25%</td>
<td>51%</td>
<td>24%</td>
</tr>
<tr>
<td>Involvement in a merger or acquisition aimed at achieving cost synergy/economies of scale</td>
<td>5%</td>
<td>2%</td>
<td>93%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
<td>7%</td>
<td>99%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>5%</td>
<td>2%</td>
<td>93%</td>
</tr>
</tbody>
</table>

How do you believe the R&D function for pharmaceutical companies has changed in response to the negative economic climate? (Respondents selected up to three.)

<table>
<thead>
<tr>
<th>Change</th>
<th>Larger companies will continue to expand the number of joint ventures/alliances and outsourced R&amp;D agreements</th>
<th>Smaller companies will be the main source for innovation and new products</th>
<th>Scientists are/will flock from small to larger companies</th>
<th>Larger companies will be the main source for innovation and new products</th>
<th>Smaller companies will continue to expand the number of joint ventures/alliances and outsourced R&amp;D agreements</th>
<th>Scientists are/will flock from larger to smaller companies</th>
<th>Larger companies will materially decrease the number of joint ventures/alliances and outsourced R&amp;D agreements</th>
<th>Smaller companies will materially decrease the number of joint ventures/alliances and outsourced R&amp;D agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger companies will continue to expand the number of joint ventures/alliances and outsourced R&amp;D agreements</td>
<td>54%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smaller companies will be the main source for innovation and new products</td>
<td></td>
<td>36%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientists are/will flock from small to larger companies</td>
<td></td>
<td></td>
<td>32%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larger companies will be the main source for innovation and new products</td>
<td></td>
<td></td>
<td></td>
<td>28%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smaller companies will continue to expand the number of joint ventures/alliances and outsourced R&amp;D agreements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientists are/will flock from larger to smaller companies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larger companies will materially decrease the number of joint ventures/alliances and outsourced R&amp;D agreements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Smaller companies will materially decrease the number of joint ventures/alliances and outsourced R&amp;D agreements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10%</td>
</tr>
</tbody>
</table>
Do you believe that your company’s overarching strategy will change as a result of the global economic recession?

- No: 23%
- Yes, there will be minor changes: 50%
- Yes, there will be major changes: 17%
- Yet to be determined: 7%
- Don’t know: 3%

What strategic action is your organization taking to drive revenue growth in response to the global economic recession? (Respondents selected up to three.)

- Improving efficiency of processes: 46%
- Accelerating geographic diversification into new markets: 31%
- Focusing more on the end-user (patient): 30%
- Accelerating introduction of new products to market: 27%
- Strengthening relationships with payers: 25%
- Forming new distribution partnerships (including licensing deals): 24%
- Increasing speed to market: 15%
- Instituting price cuts and/or discounting: 15%
- Strengthening relationships with regulators: 13%
- Instituting price increases: 7%
- Increasing marketing budget: 6%
- Other: 5%
- Don’t know: 5%
How important were each of the following strategic initiatives to your company prior to the onset of the global recession at the end of 2008?
(Rated on a scale of 1 to 5, where 1=Critical and 5=Not important.)

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Rating 1</th>
<th>Rating 2</th>
<th>Rating 3</th>
<th>Rating 4</th>
<th>Rating 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving internal product pipeline through restructuring R&amp;D organization</td>
<td>25%</td>
<td>28%</td>
<td>21%</td>
<td>9%</td>
<td>17%</td>
</tr>
<tr>
<td>Improving product pipeline by acquiring products in phases 2 and 3 of clinical trials</td>
<td>12%</td>
<td>22%</td>
<td>23%</td>
<td>10%</td>
<td>33%</td>
</tr>
<tr>
<td>Geographic expansion into BRIC markets (Brazil, Russia, India or China)</td>
<td>18%</td>
<td>27%</td>
<td>17%</td>
<td>10%</td>
<td>28%</td>
</tr>
<tr>
<td>Other geographic expansion</td>
<td>10%</td>
<td>26%</td>
<td>28%</td>
<td>14%</td>
<td>22%</td>
</tr>
<tr>
<td>Streamlining the overall cost structure of the business</td>
<td>24%</td>
<td>36%</td>
<td>27%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Implementing a disease management framework</td>
<td>7%</td>
<td>21%</td>
<td>30%</td>
<td>13%</td>
<td>29%</td>
</tr>
<tr>
<td>Restructuring the sales and marketing model</td>
<td>12%</td>
<td>29%</td>
<td>31%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Improving product development cycle time – speed to market</td>
<td>19%</td>
<td>35%</td>
<td>25%</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>Consolidation – merging/acquiring companies for economies of scale</td>
<td>9%</td>
<td>19%</td>
<td>25%</td>
<td>19%</td>
<td>28%</td>
</tr>
<tr>
<td>Restructuring manufacturing and supply-chain operations</td>
<td>9%</td>
<td>29%</td>
<td>28%</td>
<td>12%</td>
<td>22%</td>
</tr>
<tr>
<td>Outsourcing back-office, infrastructural and other non-core business processes</td>
<td>6%</td>
<td>16%</td>
<td>31%</td>
<td>17%</td>
<td>30%</td>
</tr>
<tr>
<td>&quot;Averaging up&quot; global talent pool</td>
<td>7%</td>
<td>29%</td>
<td>30%</td>
<td>13%</td>
<td>21%</td>
</tr>
</tbody>
</table>
How important will each of the following strategic initiatives be to your company in the next five years? (Rated on a scale of 1 to 5, where 1=Critical and 5=Not important.)

<table>
<thead>
<tr>
<th>Initiative</th>
<th>1 = Critical</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 = Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving internal product pipeline through restructuring R&amp;D organization</td>
<td>15%</td>
<td>30%</td>
<td>15%</td>
<td>7%</td>
<td>13%</td>
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<td>21%</td>
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<td>15%</td>
<td>5%</td>
<td>26%</td>
</tr>
<tr>
<td>Other geographic expansion</td>
<td>11%</td>
<td>36%</td>
<td>24%</td>
<td>12%</td>
<td>17%</td>
</tr>
<tr>
<td>Streamlining the overall cost structure of the business</td>
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<td>36%</td>
<td>24%</td>
<td>12%</td>
<td>17%</td>
</tr>
<tr>
<td>Implementing a disease management framework</td>
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<td>31%</td>
<td>13%</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>Restructuring the sales and marketing model</td>
<td>24%</td>
<td>30%</td>
<td>10%</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>Improving product development cycle time – speed to market</td>
<td>29%</td>
<td>38%</td>
<td>20%</td>
<td>5%</td>
<td>8%</td>
</tr>
<tr>
<td>Consolidation – merging/acquiring companies for economies of scale</td>
<td>12%</td>
<td>30%</td>
<td>16%</td>
<td>21%</td>
<td>21%</td>
</tr>
<tr>
<td>Restructuring manufacturing and supply-chain operations</td>
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<td>32%</td>
<td>28%</td>
<td>13%</td>
<td>16%</td>
</tr>
<tr>
<td>Outsourcing back-office, infrastructural and other non-core business processes</td>
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<td>21%</td>
<td>30%</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>“Averaging up” global talent pool</td>
<td>17%</td>
<td>29%</td>
<td>28%</td>
<td>10%</td>
<td>16%</td>
</tr>
</tbody>
</table>
Which of the following strategies will be the most important in securing your company’s continued success through 2015?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing a robust R&amp;D pipeline</td>
<td>25%</td>
</tr>
<tr>
<td>Forming alliances and/or partnerships with pharma/biotech/medical device firms</td>
<td>17%</td>
</tr>
<tr>
<td>Developing a closer relationship with our customers</td>
<td>15%</td>
</tr>
<tr>
<td>Acquiring strategic businesses</td>
<td>10%</td>
</tr>
<tr>
<td>Recruiting and retaining top-tier managers and scientists</td>
<td>9%</td>
</tr>
<tr>
<td>Cutting operating costs</td>
<td>6%</td>
</tr>
<tr>
<td>Fueling growth of core businesses with volume and price increases</td>
<td>6%</td>
</tr>
<tr>
<td>Streamlining and shortening the commercialization process</td>
<td>5%</td>
</tr>
<tr>
<td>Developing information networks (e.g., data on patients’ profiles)</td>
<td>3%</td>
</tr>
<tr>
<td>Improving the company’s ethical and financial reputation</td>
<td>2%</td>
</tr>
<tr>
<td>Focusing on in-house product discovery</td>
<td>2%</td>
</tr>
</tbody>
</table>

Which of the following statements regarding R&D are relevant for your organization? “The global economic recession has led to ________.”

(Respondents selected all that applied.)

<table>
<thead>
<tr>
<th>Statement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater focus on products that are likely to provide a more immediate return</td>
<td>43%</td>
</tr>
<tr>
<td>Reduction in total R&amp;D spend</td>
<td>32%</td>
</tr>
<tr>
<td>Expansion of R&amp;D partnerships/networks with other firms</td>
<td>26%</td>
</tr>
<tr>
<td>Reduction in R&amp;D overheads</td>
<td>17%</td>
</tr>
<tr>
<td>Expansion of the number of collaborations with non-profits/academic community</td>
<td>16%</td>
</tr>
<tr>
<td>Increase in other outsourced research and/or development activities</td>
<td>15%</td>
</tr>
<tr>
<td>Increased offshore R&amp;D and/or clinical activities</td>
<td>14%</td>
</tr>
<tr>
<td>Increase in number of outsourced clinical trials</td>
<td>14%</td>
</tr>
<tr>
<td>Reduction in the number of compounds in the R&amp;D pipeline</td>
<td>14%</td>
</tr>
<tr>
<td>Acquisition of more R&amp;D-oriented firms</td>
<td>10%</td>
</tr>
<tr>
<td>Increase in the number of compounds in the R&amp;D pipeline</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>13%</td>
</tr>
</tbody>
</table>
In which region are you personally based?

- Western Europe: 33%
- Asia-Pacific: 28%
- North America: 26%
- Middle East and Africa: 6%
- Latin America: 4%
- Eastern Europe: 3%
- Other: 3%

In which country are you personally located?

- United States of America: 22%
- India: 10%
- United Kingdom: 10%
- Australia: 8%
- Canada: 5%
- Switzerland: 4%
- Belgium: 3%
- Singapore: 3%
- Germany: 3%
- Italy: 3%
- Spain: 3%
- China: 3%
- France: 2%
- Brazil: 2%
- Other: 2%
In which region is your company headquarters located?

- North America: 39%
- Western Europe: 33%
- Asia-Pacific: 19%
- Middle East and Africa: 5%
- Latin America: 3%
- Eastern Europe: 3%

In which country is your company headquarters located?

- United States of America: 36%
- United Kingdom: 10%
- India: 7%
- Australia: 6%
- Switzerland: 5%
- Germany: 4%
- Belgium: 3%
- Canada: 3%
- Italy: 2%
- France: 2%
- Other: 22%
What is your primary industry sector?

- Healthcare Services: 24%
- Medical Devices: 16%
- Biotechnology: 14%
- Pharmaceutical R&D: 9%
- Pharmaceutical Manufacturing: 8%
- Pharmaceutical Wholesale/Retail: 6%
- Contract Research: 2%
- Distribution: 8%
- Other: 13%

What are your company’s global annual revenues in US dollars?

- $15bn or more: 38%
- $5bn to $15bn: 9%
- $1bn to $5bn: 15%
- $500m to $1bn: 6%
- $100m to $500m: 17%
- Less than $100m: 7%
- Not applicable: 8%

Which of the following best describes your job title?

- Board member: 6%
- CEO/President/Managing director: 25%
- CFO/Treasurer/Controller: 9%
- CIO/Technology director: 4%
- Other C-level executive: 4%
- SVP/VP/Director: 17%
- Head of business unit: 5%
- Head of department: 6%
- Manager: 14%
- Other: 10%
What are your main functional roles?
(Respondents selected up to three.)

- General management: 41%
- Strategy and business development: 41%
- Marketing and sales: 27%
- Finance: 22%
- R&D: 15%
- Operations and production: 13%
- Customer service: 10%
- Information and research: 8%
- Human resources: 5%
- IT: 4%
- Procurement: 4%
- Risk: 4%
- Supply-chain management: 3%
- Legal: 2%
- Other: 6%
Endnotes

1 www.expresspharmaonline.com/20091130/retrospective200907.shtml
3 www.fiercepharma.com/special-reports/top-10-layoffs-2009
4 online.wsj.com/article/SB10001424052748703740004574513263672180956.html
5 www.reuters.com/article/idUSTRE5A23YZ20091103
7 tools.businessweek.com/layoffs/view?url=http%3A%2F%2Fowler.com%2Fclick%2Fhere.pl%3Fid25909351.377%26f%3D9791
8 www.fiercebiotech.com/story/az-restructuring-will-take-1b-bite-out-r-d/2010-01-28
13 www.ft.com/cms/s/0/07df879e-6427-11de-a818-00144feabdc0.html

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The future of the life sciences industries

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