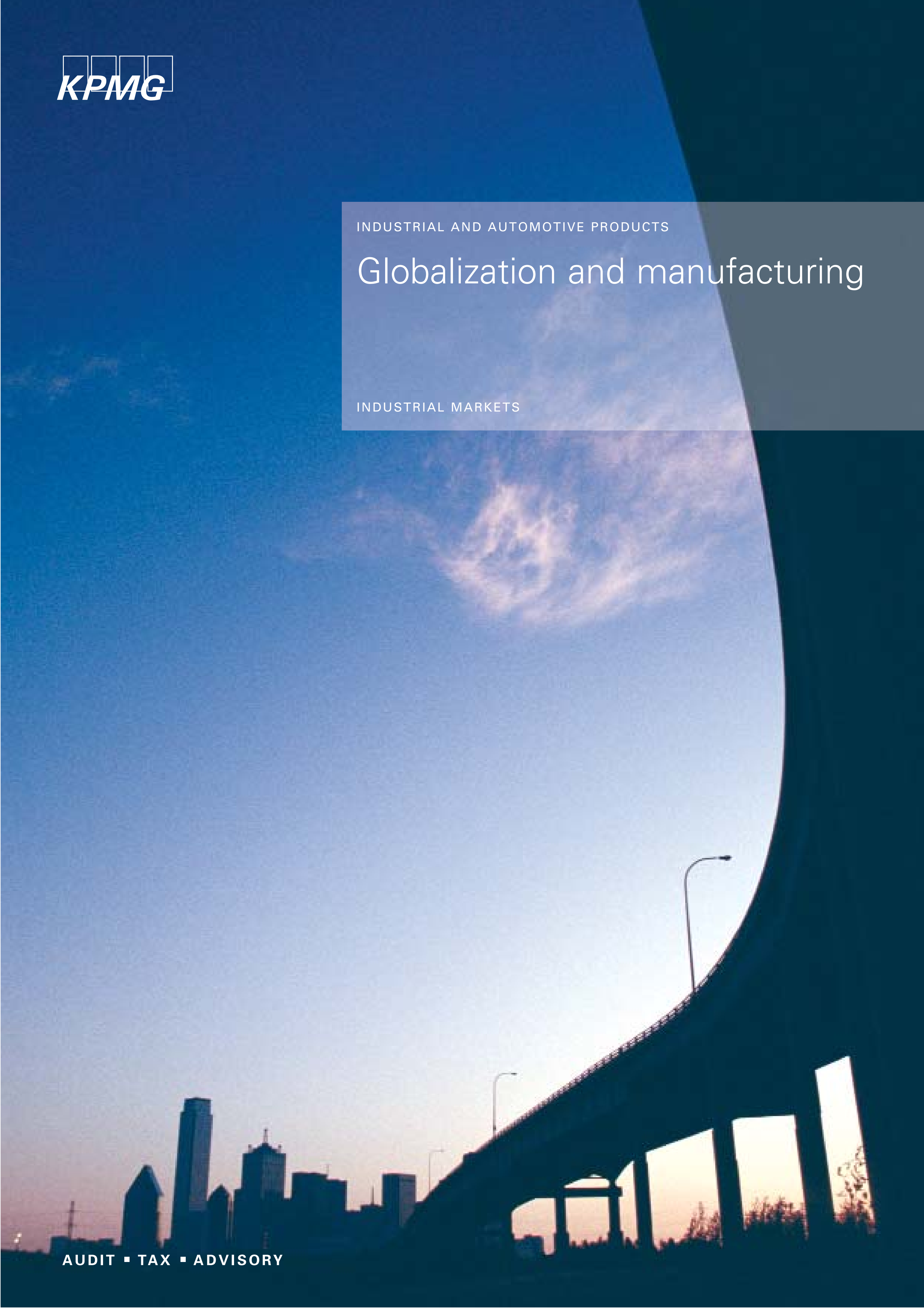
INDUSTRIAL AND AUTOMOTIVE PRODUCTS

Globalization and manufacturing

INDUSTRIAL MARKETS



AUDIT ▪ TAX ▪ ADVISORY

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Preface

KPMG International commissioned the Economist Intelligence Unit (EIU) to produce this report, which explores some of the key challenges facing manufacturers globally and is based on the following research activities:

- **The Economist Intelligence Unit conducted a wide-ranging survey of 232 senior executives of manufacturing companies globally about the challenges facing their industries. The survey was conducted in September and October 2005.**

- **To supplement the survey results, the Economist Intelligence Unit conducted in-depth interviews with senior executives of companies operating across a range of manufacturing sectors, with a particular focus on managers in electrical and mechanical engineering companies.**

Introduction

KPMG International commissioned the Economist Intelligence Unit (EIU) to produce this report on Globalization and Manufacturing with the aim of providing some insight into the opportunities and challenges global manufacturers are being faced with. The EIU canvassed the views of over 230 large manufacturing companies from around the world.

Their findings show that in the short to medium term at least, manufacturers in developed markets have plenty to be optimistic about. While they do have to confront new competitors in their home markets and face intense competition in foreign markets, there exist however substantial opportunities to expand both on the domestic and overseas front. For the survey respondents, globalization is more about market access than low cost manufacturing.

This positive picture however is tempered by serious warning signs. With the exception of Germany, Sweden and Denmark, organizations in many of the developed economies show signs of serious under-investment in R&D and just 26 percent of survey respondents are hoping to improve profitability by becoming more innovative over the next three years. For manufacturers in developed markets, the continuous innovation is likely to be one of the primary defenses in maintaining their competitive position. To maintain this position it appears essential that they continue to develop their ability to deliver high value, relative to competitor manufacturing centers and to innovate. Organizations in the more mature economies have also tended to take an instinctive approach to risk management, often lacking a formalized risk management program. This could potentially leave them exposed if they follow the same approach when they seek to gain a foothold in another less regulated economy.

I would like to extend our thanks to the Economist Intelligence Unit for their work and to all those who freely offered their knowledge and opinions to benefit of this report.

Harald von Heynitz
Global Chair Industrial & Automotive Products practice
and partner in KPMG in Germany

Globalization and manufacturing

Executive summary
(by Economist Intelligence Unit)

Manufacturers are globalizing rapidly against a background of exceptionally fast growth in world trade. While the market opportunities are enormous, they are likely to face intense competition both in their home markets and in the foreign markets into which they need to expand. This study from the EIU reveals, however, that the nature of these challenges may not what conventional wisdom assumes – it is not all about low-cost manufacturing. While low-cost labor has a role to play, many manufacturers are going global to access a range of opportunities and resources available in different international markets.

The findings in this report are based on the EIU's global survey of 232 senior executives in the manufacturing sector, together with a number of in-depth interviews conducted with some of the leading figures in the industry. The EIU's main conclusions include the following:

Nearness to developed markets, infrastructure and a high skill base still yield results as long as they are harnessed effectively to deliver innovative production solutions

- **Globalization is about market access, not just low costs:** The rapid growth of manufacturing in Asia is leading to declines in the relative dominance of North American and Western European companies, but manufacturing in developed markets is not doomed. Although a lot of new money is going into facilities in emerging economies, this is at least partly a strategy of having production close to new customers rather than simply a flight from high labor costs. Indeed, the survey shows home bases remain attractive locations for investment in production, with local facilities set to account for 54 percent of new North American funding and 59 percent of funding in Western Europe (66 percent if you include factories in the new EU states). Nearness to developed markets, infrastructure and a high skill base can still yield results as long as they are harnessed effectively to deliver innovative production solutions.

- **Emerging markets are not the whole story:** Many manufacturers are looking to move away from dependence on home sales. Emerging markets are an important part of this, with 30 percent of companies worldwide expecting growing wealth there to contribute to their strategy.* China's share of respondents' sales is expected to grow very substantially, as is that of new EU states. It is important not to write off mature markets, however. North American manufacturers still expect growth in Western Europe and vice versa. Manufacturers are diversifying their markets worldwide, not just to fast-growing emerging markets.

- **Asian manufacturers are closing the gap:** The challenge from Asian competitors is likely to continue to intensify. For now, many Asian companies, with the exception of those based in Japan, are still playing catch-up in many areas, but they appear to be pushing hard to close the gaps. Even in areas where they have been relatively weak, such as corporate governance, Asian companies are now investing heavily to establish trust with their developed-market customers. As one executive interviewed for this report notes, "The speed of development in Asia is almost unbelievable."

As companies move into new markets where their experience is limited, the need for a more focused approach to risk management will become acute

- **Expansion raises the bar on risk management:** It appears that manufacturers have tended to take an instinctive approach to risk management, often relying on the experience of the CEO or CFO to lead the response to emerging threats. Few manufacturers have a dedicated head of risk at board level, with less than 3 percent of respondents in the survey saying they have a chief risk officer (CRO). This is in stark contrast with the 60 percent of financial services companies that have already appointed a CRO, according to another recent survey by the Economist Intelligence Unit.[1] As companies move into new markets where their experience is limited, the need for a more focused approach to risk management will become acute. A strategy for enterprise risk management, supported by integrated risk management tools, is likely to be one of the hallmarks of a well-run manufacturing business.

- **Manufacturers must innovate to survive:** Faced with intense price pressures, manufacturers in high-cost locations may be able to insulate themselves from price pressures. Some companies do not seem to be doing enough in this area. Just 26 percent of the survey respondents intend to improve their innovation capacity to boost profitability. Of most concern to EIU are manufacturers in Western Europe: with the exception of Sweden, Denmark and Germany, Western European countries are investing too little in R&D to ensure that they will be able to compete on the basis of innovation and technology.

As China and other countries in the Asia-Pacific region grow wealthier and more active in manufacturing, their relative importance as markets and production centers is likely to increase, sometimes spectacularly so given low starting points. It does not mean, however, that manufacturing in North America and Western Europe is destined to die out. Manufacturers that can learn to continuously innovate across their operations may find that there are opportunities to be had in developed, as well as developing, markets.

1 *The Evolving Role of the CRO*, Economist Intelligence Unit, 2005

Challenges

The global economy is expanding quickly, driven largely by strong growth in emerging markets and rapid growth in world trade. Global GDP growth reached 5 percent in 2004,* the best performance in a decade, and the Economist Intelligence Unit expects it to average 4 percent per annum over the next five years. The distribution of GDP growth is likely to be very uneven, however, with much of the expected growth set to take place in emerging markets, in particular China and India. It is a similar story with world trade growth, with trade by emerging economies set to expand almost twice as fast as that of developed ones.

The relentless pace of globalization: growth by region

	2001 (%)	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)	2010 (%)
Growth in the world	2.3	2.7	3.7	5.0	4.3	4.0	3.9	3.9	4.0	3.9
North America	0.8	1.7	2.6	4.2	3.6	2.9	2.9	3.0	3.1	3.1
Western Europe	1.8	1.3	1.3	2.6	1.7	2.0	2.3	2.3	2.3	2.2
Japan	0.2	-0.3	1.4	2.6	2.2	1.3	1.1	1.2	1.1	1.2
China	7.5	8.0	9.3	9.4	9.3	8.0	7.5	7.0	7.0	6.9
India	5.2	4.1	8.6	6.9	7.6	7.0	6.5	6.6	6.6	6.5
Growth in world trade	-0.4	3.5	5.5	10.8	6.7	6.8	7.1	7.7	7.9	7.8
Developed economies	-1.0	1.6	2.9	8.1	5.2	5.1	5.6	6.0	6.3	6.2
Developing economies	1.2	8.6	12.0	16.9	9.9	10.1	10.1	10.7	10.8	10.7

Source: Economist Intelligence Unit

The emergence of China in particular as a manufacturing colossus is certainly having a major impact on all industrialized economies. This is most obvious in the case of the electronics and IT industry, where China's virtual monopoly in the production of computers and other electronic products such as flat-screen TVs, MPC players and cellular phones is forcing down prices in these areas. "If a technology can be commoditized, it will be commoditized," states Andrew Coward, Asia Chief Technology Officer (CTO) of Juniper Networks, one of the world's largest suppliers of routers and other telecom network infrastructure.

"If a technology can be commoditized, it will be commoditized"

Andrew Coward
Asia Chief Technology Officer,
Juniper Networks

China's hi-tech skill base is also rising rapidly. Last year China produced 21 percent of the world's software graduate engineers, against 7 percent for India and 5 percent for the United States.* China is also expected to produce more graduates and PhDs in science and engineering than America by 2010. Nortel Networks is just one example of a company that sees China as a vital source of

*Source: Economist Intelligence Unit, January 2005

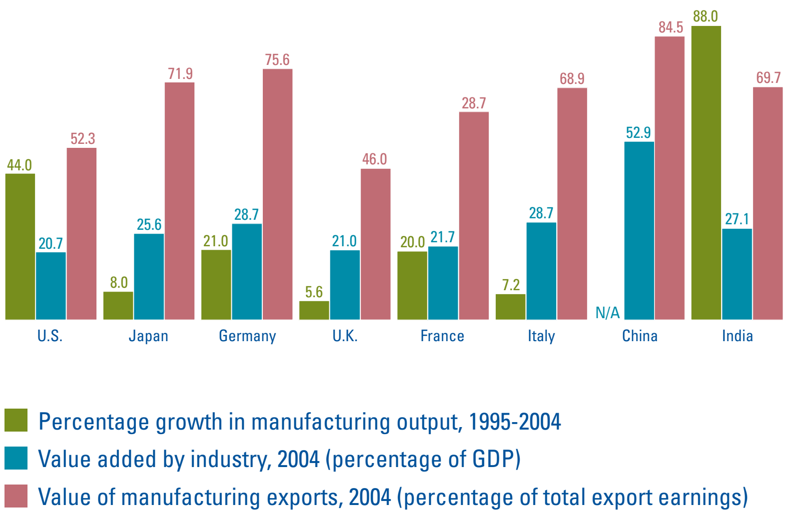
R&D expertise. The Canadian telecoms equipment vendor will open a huge campus for researchers in Beijing in 2006, centralizing many of its global R&D functions. Michael Pangia, Nortel's President and Chief Operating Officer of the company's Asia-Pacific business, believes that "Asia will be the center of high-technology manufacturing for the foreseeable future". Gerard Ruizendaal, Head of Corporate Strategy at Philips, observes after many trips to China that "the speed of learning is almost unbelievable", and that there is now "more knowledge on how to do consumer electronics in China (and Taiwan) than there is in Europe".

"Asia will be the center of high-technology manufacturing for the foreseeable future"

Michael Pangia
President and COO,
Nortel Asia-Pacific

Does it matter if developed markets lose out to Asia as locations for manufacturing? The EIU believes the answer is yes. The continued importance of manufacturing as a source of wealth generation in developed markets should not be underestimated – productivity growth in manufacturing accounts for much of the overall productivity growth in developed economies, and hence for increases in living standards. What's more, manufacturing accounts for large shares of export earnings, even in economies with large service sectors such as the U.S. and U.K. The future of the manufacturing industry is therefore of paramount importance to all major economies.

The significance of manufacturing



Source: Economist Intelligence Unit

Going global

Sluggish growth in their home markets will be a further factor driving manufacturers in the developed world to pursue growth in emerging markets over the coming years. Thirty percent of companies worldwide are looking to these markets to drive growth

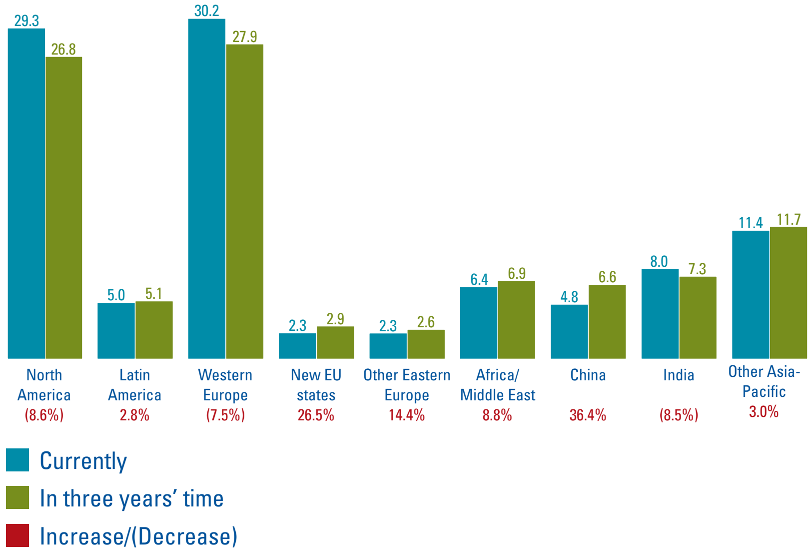
It would be wrong to conclude, however, that China's economic expansion sounds the death knell for manufacturers in developed markets. If anything, Asia's expanding markets are seen as an opportunity more than a threat by many manufacturers in the survey. Sluggish growth in their home markets may be a further factor driving manufacturers in the developed world to pursue growth in emerging markets over the coming years. The survey found 30 percent of companies worldwide are looking to these markets to drive growth.

What are your company's strategic priorities over the next three years?
(percentage respondents)

Source: Economist Intelligence Unit survey, 2005

The survey results reveal that Western European manufacturers expect the proportion of sales generated in their home markets to drop from 64 percent to 57 percent; North American manufacturers expect this proportion to decline from 69 percent to 63 percent. The significance of this should not be exaggerated, however. North American companies, for example, expect Western Europe to account for a higher proportion of their sales in three years, whereas Western European companies have similar expectations for their U.S. sales. Companies are diversifying geographically, but there are opportunities for growth in developed as well as developing markets.

Sales by region (percentage respondents)



Source: Economist Intelligence Unit survey, 2005

"Although we have built major operations with major revenue streams in Brazil, China, India, and Russia, many of our biggest opportunities for sales growth still lie in the developed world where there is huge scope for infrastructure renewal"

Robert Blackburn,
VP Corporate Strategies,
Siemens A.G.

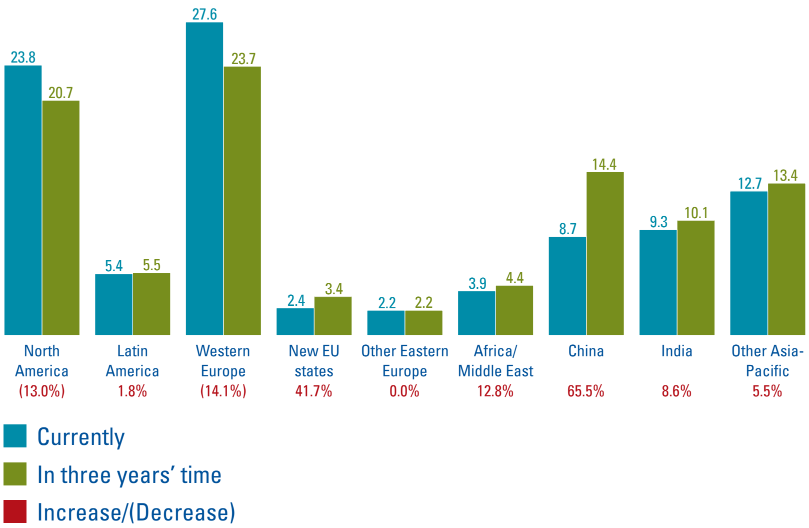
"A truly global business – global in terms of customers and global in terms of development and manufacturing and R&D"

Joseph T. Lower,
VP Corporate Development,
Boeing

Manufacturers are therefore going truly global rather than turning their backs on their traditional markets. "Although we have built major operations with major revenue streams in Brazil, China, India, and Russia, many of our biggest opportunities for sales growth still lie in the developed world where there is huge scope for infrastructure renewal," says Robert Blackburn, VP of Corporate Strategies at Siemens.

The same applies to production strategies. "A truly global business – global in terms of customers and global in terms of development and manufacturing and R&D," is how Joseph Lower, VP of Corporate Development at Boeing, the U.S. aerospace and defense company, describes his company. Boeing used to manufacture a substantial portion of its aircraft in its own captive facilities, employing a vertically integrated approach. However, the increasingly competitive and global marketplace has driven Boeing to pay greater attention to the cost and efficiency of its production process. The company's latest jet airliner, the 787, uses components from a global network of suppliers, making it a far more international product than previous generations of aircraft.

Percentage of company production by region



Source: Economist Intelligence Unit survey, 2005

Which of the following criteria are important to your company when deciding where to locate production? (percentage respondents)

Source: Economist Intelligence Unit survey, 2005

"Manufacturing in China is only fully cost-effective if you are able to source some high value-added components in China"

Robin Beran
Director of Corporate Tax, Caterpillar

Companies are making use of globalization to produce where it is most cost-effective. For example, Philips has kept its high-tech lighting factories, which it considers an asset and a competitive advantage, in Western Europe, and has no plans to relocate this production. However, the company has moved its consumer electronics manufacturing, which Mr Ruizendaal describes as "low end commodity", to China. Indeed, according to Robin Beran, Director of Corporate Tax at the U.S.-based construction equipment manufacturers, Caterpillar, "Manufacturing in China is only fully cost-effective if you are able to source some high value-added components in China."

When deciding how to distribute their manufacturing activities, companies weigh up three main considerations: market access; costs and skills.

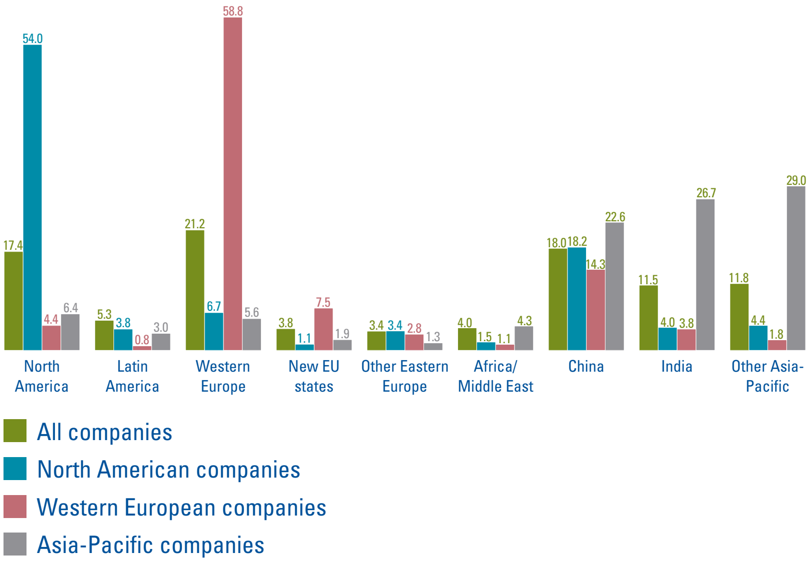
"Manufacturing has to be where the markets are. Countries are saying, if you want to sell it in our country, you have to come and make it here"

Lord Bhattacharyya
Warwick University's Manufacturing Group

Market access

Lord Bhattacharyya of Warwick University's Manufacturing Group argues that the motive for going global is not so much about offshoring production but rather the desire to enter new, fast-growing markets. "Manufacturing has to be where the markets are. Countries are saying, if you want to sell it in our country, you have to come and make it here," he explains. A good example of this is ThyssenKrupp, a German engineering conglomerate. When the company started manufacturing escalators and elevators in China, this had more to do with demonstrating its commitment to the Chinese authorities. Neither were low labor costs the primary motivation for the company's investment of over US$2 billion in new manufacturing facilities in Latin America. "We are going into Brazil in order to be close to the source of raw materials," explains Dr Stefan Kirsten, the company's CFO.

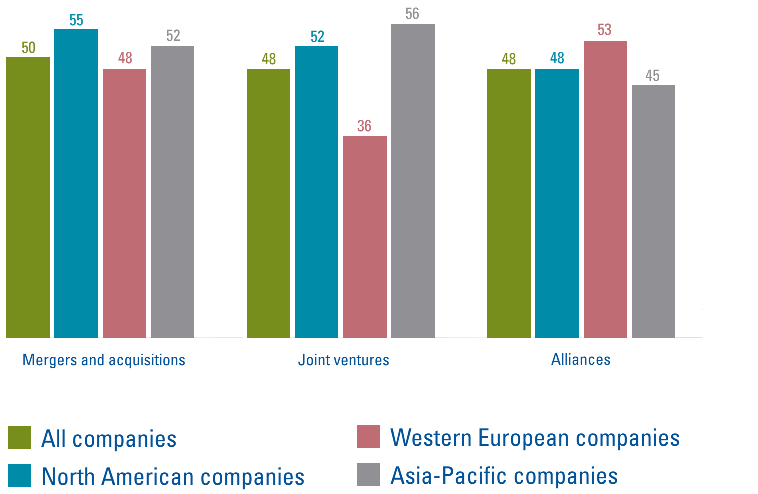
Investment in new manufacturing capacity by region over the next three years. (percentage respondents)



Source: Economist Intelligence Unit survey, 2005

There is no single way of entering new markets, of course. Establishing production facilities and distribution networks in a new market can be very time-consuming and costly. An alternative strategy is to pursue mergers and acquisitions in target markets. Indeed, half of the respondents to the survey intend to do this over the next three years, with North American companies especially enthusiastic. Almost as many companies intend to pursue alliances and joint ventures. These strategic priorities point to ongoing consolidation and rapid globalization.

Which of the following strategies, if any, does your company intend to undertake over the next three years? (percentage respondents)



Source: Economist Intelligence Unit survey, 2005

"Labor costs are certainly an important factor for less sophisticated components, but are less relevant for highly engineered products and components"

Robin Beran
Director of Corporate Tax, Caterpillar

Costs are important, but not everything

The debate over the impact of globalization on the manufacturing sector is often couched in terms of labor costs, as though this is always the determining factor in decisions about where to locate production. While clearly labor costs are a crucial factor for commoditized sectors such as electronics, they are much less of an issue in the mechanical and electrical engineering sectors. Says Robin Beran of Caterpillar: "Labor costs are certainly an important factor for less sophisticated components, but are less relevant for highly engineered products and components."

Indeed, lower labor costs do not emerge in the survey as a factor likely to deliver higher profits, with only 22 percent of companies hoping to boost the bottom line through outsourcing and 20 percent through lower labor costs. The survey found that while there are regional differences – 30 percent of Western European companies see high labor costs as an obstacle to improved profitability – it is the availability of skilled labor rather than labor costs that is of most concern to manufacturers. Indeed, companies should be wary of shifting production to low cost locations in order to leverage cost efficiencies, as these are not likely to persist. According to Lord Bhattacharyya, the "whole business of low cost base is only transitory. If you set up a factory solely for the low cost base, you are going to come unstuck."

The EIU believes costs in China could rise significantly in the near future. The country's currency, the renminbi, is hugely undervalued against the dollar and the euro, which is one of the reasons for China's competitiveness as an industrial location and its huge trade surplus. While the Chinese authorities have been successful in holding the renminbi down by purchasing large volumes of U.S. treasuries – Chinese international reserves have risen by US$200 billion over the last 12 months* – a major realignment of exchange rates is needed to address the underlying trade imbalances. This implies a potentially very sizeable revaluation of the renminbi, which is likely to make China a much more expensive place to produce for foreign manufacturers. The expectation that costs in China will increase sharply has been one of the reasons that Canon, the Japanese camera maker, has decided to move production back from China to highly automated plants in Japan.

"We're seeing fewer and fewer students in Europe in maths and science. We have to show our young people that these are wonderful areas to work in"

Robert Blackburn,
VP Corporate Strategies,
Siemens A.G.

Skills – the critical importance of human capital

When asked to rank the biggest challenges facing their companies, 45 percent of the survey respondents cited the difficulties of acquiring employees with the right skills, making this the second most pressing challenge after controlling costs. Central to their ability to be more innovative and responsive is recruiting and retaining the right personnel. It is in this area that countries in Western Europe as well as North America and Japan will need to work hard if they are to retain their attractiveness as locations for mechanical and electrical engineering. By contrast, China and India offer large numbers of engineering graduates, who cost a fraction of the amount to hire than their counterparts in developed markets. The dearth of these skills in the West worries some observers. According to Robert Blackburn, VP of Corporate Strategy at Siemens, "We're seeing fewer and fewer students in Europe in maths and science. We have to show our young people that these are wonderful areas to work in." Failure to meet this challenge may only accelerate the loss of high-value manufacturing from developed to developing economies.

Which of the following pose the biggest challenges for your company?
(percentage respondents)

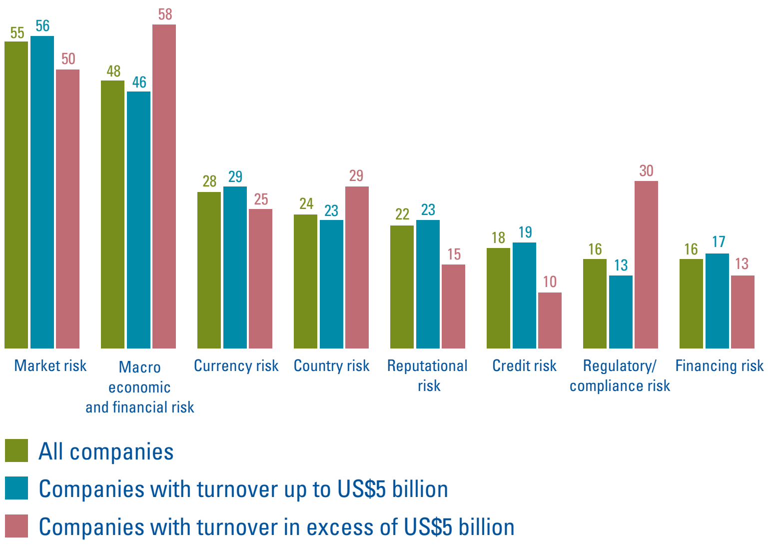
Source: Economist Intelligence Unit survey, 2005

*Source: Economist Intelligence Unit, January 2006

Expanding the remit of risk

Globalizing their production networks and increasing the proportion of their sales generated outside their home markets is exposing manufacturers to a broader range of risks. For example, the survey found that nearly 60 percent of companies with a turnover in excess of US$5 billion – which are most likely to put down capacity in foreign markets rather than just exporting into them – are concerned about macro-economic and country risks. Growing uncertainties over global economic prospects are also feeding these concerns. Although expanding rapidly, the global economy is characterized by huge imbalances, symbolized by the U.S. current account deficit, which is on course to reach 6.4 percent of U.S. GDP in 2005.* This is clearly unsustainable and will eventually demand a major adjustment in the value of the dollar. The Economist Intelligence Unit continues to view a dollar collapse as a real possibility, with potentially far-reaching consequences for developed and developing markets.

Which of the following risks are of most concern to your company?
(percentage respondents)



Source: Economist Intelligence Unit survey, 2005

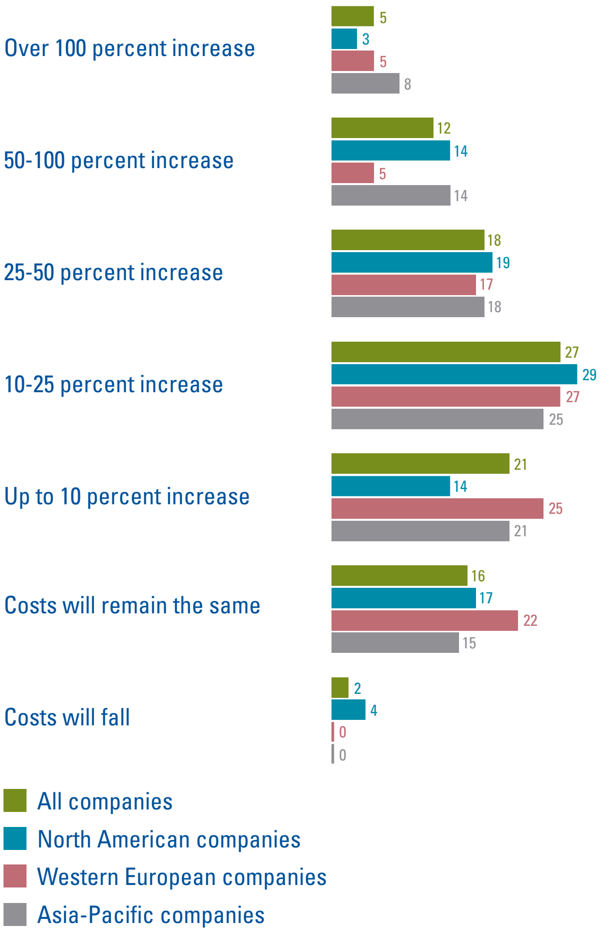
One consequence of a sharp fall in the value of the dollar would be higher long-term U.S. interest rates. Nearly 30 percent of North American respondents to the survey expect to become more dependent on short-term bank debt over the next three years, suggesting they fear a tightening of credit conditions, with higher long-term interest rates encouraging them to take on more short-term debt. By contrast, far weaker growth prospects in Western Europe mean that long-term interest rates are unlikely to increase significantly over the next two to three years, and this is reflected in the preference of Western European respondents for long-term as opposed to short-term bank debt.

*Source: Economist Intelligence Unit, January 2006

Forty percent of Asian respondents expect to spend at least 25 percent more on compliance over the next year, compared with 36 percent in North American companies and 27 percent of Western European ones.

Although the respondents to the survey seem relatively unconcerned about regulation – only 16 percent citing regulation and compliance as key risks – companies in all regions expect to significantly boost their expenditure on compliance over the next 12 months. Indeed, over 80 percent of respondents expect their expenditure on compliance to rise over the coming 12 months, with 35 percent of respondents expecting the increase to exceed 25 percent. There are significant regional differences, however, with respondents from the Asia-Pacific appearing to be more focused on these issues than their counterparts in North America and Western Europe. Forty percent of Asian respondents expect to spend at least 25 percent more on compliance over the next year, compared with 36 percent in North American companies and 27 percent of Western European ones.

By how much do you expect the cost of compliance (excluding audit fees) to change over the next 12 months?



Source: Economist Intelligence Unit survey, 2005

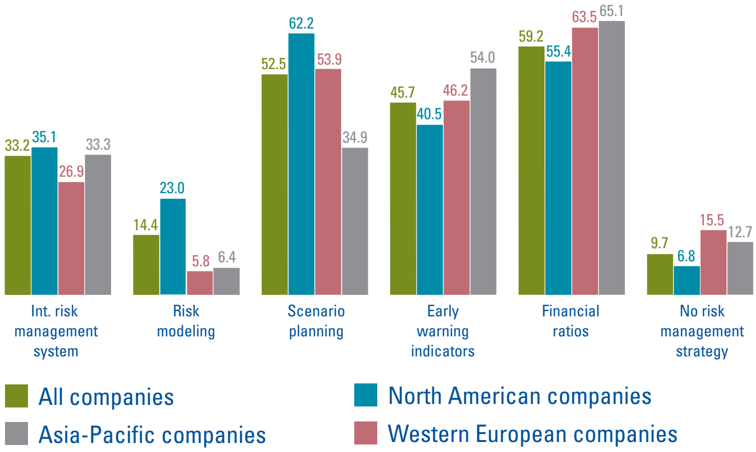
"If Asian companies want to establish strong brands and be seen as good companies to invest in, naturally they will see good governance and risk management as a key way of achieving that"

Richard Sharman
Head of Enterprise Risk Management,
KPMG in the U.K.

This is likely to be because Asian companies are playing catch-up. When asked to comment on the principal challenges to ongoing compliance with corporate governance legislation, 53 percent of Asian respondents cited the need to improve process documentation, a basic part of such activity, compared with 38 percent of North American companies and just 27 percent of Western Europeans. Poor staff awareness was also more likely to be a greater problem among Asian companies.

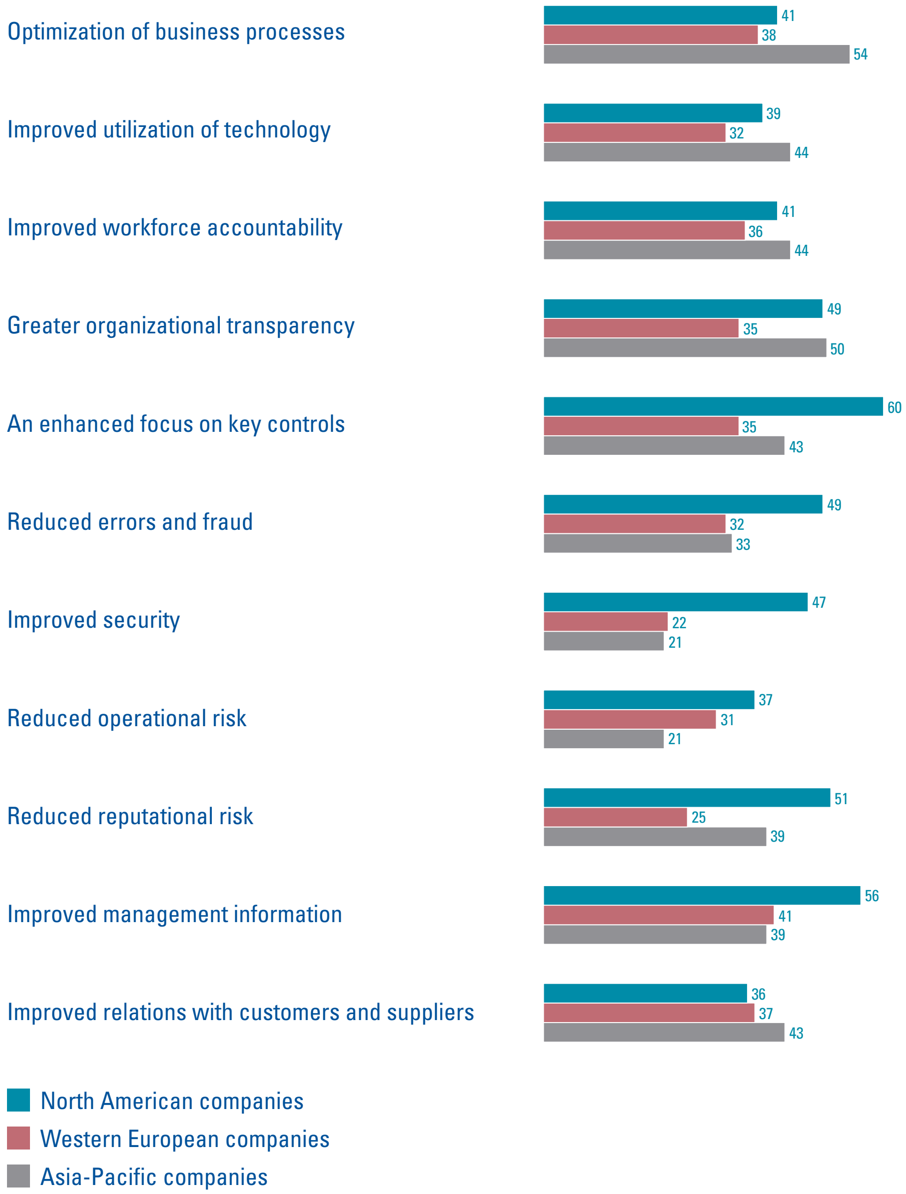
Compliance spending also brings two types of benefit for Asian companies. It allows those which have grown up quickly to put their houses in order. At the same time, it enables them to address a key disadvantage compared to more established competitors in Western markets who are able to stress their stability and adherence to compliance regimes familiar to potential consumers. Sixty percent of Asian respondents believe a strengthened focus on corporate governance would serve to differentiate them from their competitors and have a positive impact on control, a far higher proportion than in either North America or Western Europe. Similarly, far more Asian companies see an enhanced focus on compliance delivering reduced errors, fraud, and reputational risk than in North America or Western Europe. Says Richard Sharman, Head of Enterprise Risk Management at KPMG's U.K. firm, "If Asian companies want to establish strong brands and be seen as good companies to invest in, naturally they will see good governance and risk management as a key way of achieving that."

Percentage of companies using various risk-management tools



Source: Economist Intelligence Unit survey, 2005

Do you expect compliance to deliver significant benefit in the following areas?
(percentage respondents)



Source: Economist Intelligence Unit survey, 2005

"Compliance is not a differentiator, but a requirement for participation"

Joseph T. Lower
VP of Corporate and Strategic Development, Boeing

Companies in North America and Europe appear to be less concerned about compliance risks, and also see fewer benefits arising from investment in this area. This is probably because these companies are further progressed in their compliance initiatives, and see extra spending as unnecessary. As Joseph T. Lower, Boeing's VP of Corporate and Strategic Development, says, "Compliance is not a differentiator, but a requirement for participation."

If your company has a risk-management strategy, who is primarily responsible for managing/monitoring risk? (percentage respondents)

Source: Economist Intelligence Unit survey, 2005

There are good reasons why compliance risks are a lower concern for many manufacturers compared with more highly regulated sectors such as financial services, where the penalties for non-compliance tend to be more severe. But the survey also indicates that risk management overall is not given sufficient priority or focus in many manufacturing companies. The vast majority of manufacturers surveyed don't have a chief risk officer or dedicated head of risk management, for example. In the survey, just one North American respondent and two Western European respondents had appointed a chief risk officer (CRO). Surprisingly, Asia- Pacific companies do better, though only slightly: here four of the survey respondents had appointed a CRO. Overall, the contrast with financial services companies could not be starker: in a recent global survey of nearly 100 financial services companies by the Economist Intelligence Unit, over 60 percent of respondents already had a CRO in place and 20 percent planned to appoint one within two years.

"Many manufacturers haven't embedded risk management into their business yet. Risk is an add-on to the CEO or CFO's job, neither of whom probably have enough time to properly focus on it"

Frank Wiethoff
Partner,
KPMG in Germany

"Many manufacturers haven't embedded risk management into their business yet. Risk is an add-on to the CEO or CFO's job, neither of whom probably have enough time to properly focus on it," says Frank Wiethoff, a partner at KPMG's German firm who advises manufacturing companies on risk strategy. This can have unfortunate consequences for the way risk is viewed in manufacturing organizations. "Where the CFO is in charge of risk, the emphasis tends to be on reporting processes rather than performance," observes Mr Wiethoff.

Surprisingly, one in ten manufacturers confess to having no formal risk management strategy at all. But even where a formal risk strategy is established, a lot of risk decisions are taken on the basis of gut instinct. Unlike financial services companies, Mr Wiethoff says manufacturers could struggle to quantify most of the risks that they face. As a result, they can easily overlook emerging threats or invest resources in the wrong areas.

"Many manufacturers also lack the tools required to support enterprise risk management. For example, just 27 percent of North American companies surveyed have integrated risk-management information systems in place. This comes as little surprise to Richard Sharman of KPMG's U.K. firm: "Governance is very prescriptive and finance focused in the U.S., with the result that U.S. companies appear to be lagging behind their Asian and Western European counterparts when it comes to thinking about business risk in a broad sense." By contrast Western European companies may take a broader view of risk, but the survey finds that here too only a minority claim to have integrated risk systems in place.

An instinctive approach to risk management may have worked in the past, but is becoming less reliable as companies expand into markets where their experience is more limited. Without a more focused and structured approach, the fear is that manufacturers may miss new threats and even important opportunities. Says Mr Sharman, "Companies need to be active in spotting emerging risks such as those posed by climate change, limited water supplies and the issues surrounding energy security. These are not just risks to be managed but can also present opportunities to develop new products." To do this, companies need to understand their risk appetite, and should seek to ensure that a risk perspective is properly factored into every strategic decision. For now, however, that remains a distant aspiration for many manufacturers in the survey.

Competing through innovation

"The only way a company can insulate itself from price pressures is to develop products that answer a customer need but cannot be replicated quickly by the opposition"

Dr. A. Stefan Kirsten
Chief Financial Officer,
ThyssenKrupp

"The only way a company can insulate itself from price pressures is to develop products that answer a customer need but cannot be replicated quickly by the opposition," says Dr. A. Stefan Kirsten of ThyssenKrupp. According to this view, lowering costs through outsourcing or divesting non-core assets may not be enough to ensure a bright future for manufacturers in developed markets.

The need to ensure product differentiation is something that respondents to the survey are clearly aware of, with over half expecting significant changes in sources of revenue over the next five years. A crucial factor will be innovation – offering better, more differentiated products than the competition – and knowledge of customers.

Percentage of companies expecting significant change in elements of their business model in the next five years (percentage respondents)

Source: Economist Intelligence Unit survey, 2005

"Innovation is mainly evolutionary, being more development than research, but it means we are unchallenged in a number of sectors."

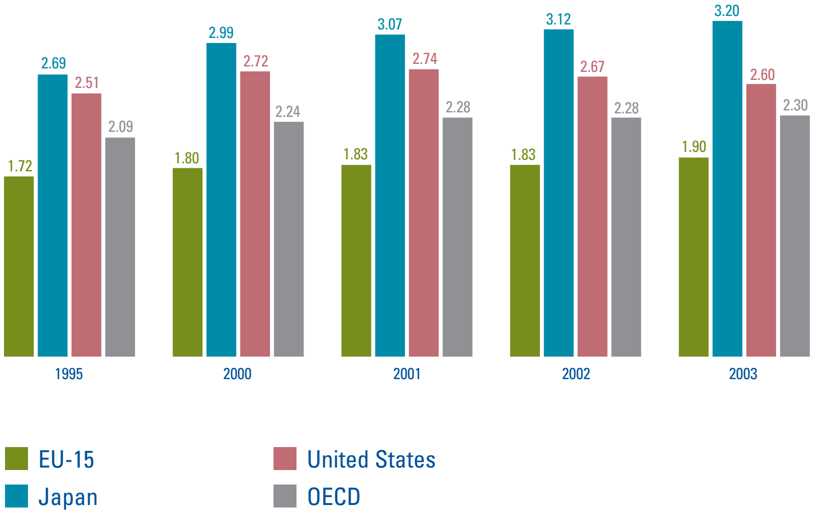
Dr. A. Stefan Kirsten
Chief Financial Officer, ThyssenKrupp

This involves taking a very long-term perspective on investment decisions and carving out areas of expertise where your company can enjoy pricing power. "It can take ten years to establish a particular material as the benchmark," says Dr. Kirsten. To establish and maintain such leading positions, constant innovation is a must: "Innovation is mainly evolutionary, being more development than research, but it means we are unchallenged in a number of sectors." Siemens has pursued a similar strategy, concentrating on capital goods. Not only does this shield it from cost pressures but leaves it well placed to profit from strong growth in emerging markets. "We focus on meeting core human needs – water, energy, transportation and healthcare. How much of the world's population can't get clean water? That's a huge opportunity for a company like ours," says Robert Blackburn.

Unfortunately the evidence points to a failure among many other companies to appreciate the critical importance of innovation. Just 26 percent of respondents hope to improve profitability by becoming more innovative, suggesting that their future could be bleak. And whereas some developed countries, such as Japan and to a slightly lesser extent the U.S., devote a relatively high proportion of their GDP to R&D, the picture in Europe is far less rosy. "European companies are not fast enough in developing new products," says Lord Bhattacharyya. With the exception of Sweden, Denmark and Germany, the remaining members of the original EU-15 are investing far too little to ensure that they will be able to compete on the basis of innovation and technology. Of particular concern are Italy and Spain, which devote little more than 1 percent of GDP to expenditure on R&D. This threatens to leave their industries vulnerable to commoditization, and hence competition from low-cost centers.

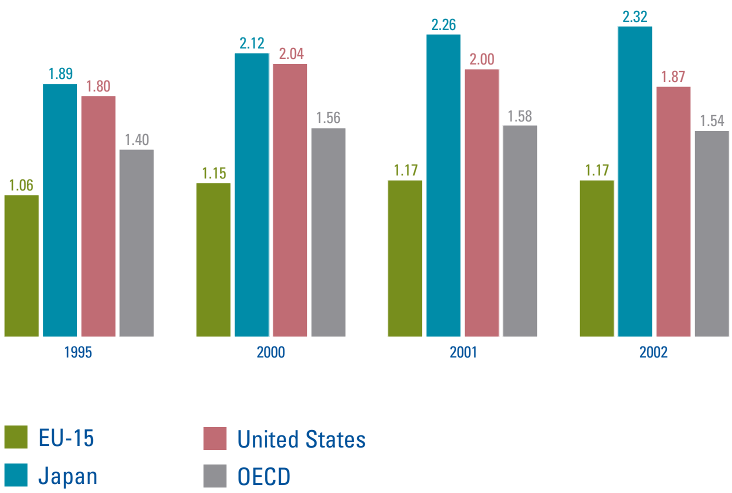
As important as expenditure on R&D is the efficiency with which it is spent. There needs to be a very good understanding of customer needs in order to ensure that research is concentrated in areas where the company can derive commercial benefits. This requires close liaison between the research function and the marketing and strategy functions. As ThyssenKrupp's Dr Kirsten says, "There is no point developing products that engineers like but which customers do not want."

R&D as a percentage of GDP



Source: OECD, 2005

Business R&D as a percentage of GDP



Source: OECD, 2005

"Basically every year you look harder at every process you have"

Gerard Ruizendaal
Head of Corporate Strategy, Philips

Innovation is not just about creating new products. Process innovations in the way that companies make and bring products to market can be as important as the products themselves. Gerard Ruizendaal of Philips explains that his company has a simple recipe to boost its productivity and efficiency: "basically every year you look harder at every process you have". The central focus is the elimination of waste at all levels – customer relations, overproduction, inventory, supply chain management, defects – and the creation of a continuous flow in the production process.

Which of the following factors do you believe are most likely to boost your company's profitability over the next three years? (percentage respondents)

Source: Economist Intelligence Unit survey, 2005

"Most manufacturers have a long way to go to bring production processes up to best practice. Only about 20 percent are at the cutting edge, leaving 80 percent with a long way to go"

Professor Chris Voss
Professor of Operations and Technology Management,
London Business School

"Most manufacturers have a long way to go to bring production processes up to best practice. Only about 20 percent are at the cutting edge, leaving 80 percent with a long way to go," says Professor Chris Voss, Professor of Operations and Technology Management at the London Business School. "There's no secret, it is just very hard to do well." Innovation in production strategies can take many forms, however, depending on the sector. For example, ThyssenKrupp manufactures a very high proportion of its products in-house, with direct control over production seen as necessary in order to retain the exclusivity of its technology. The company carries the full cost of product development but also the rewards that flow from it.

"We have partnered with organizations who we believe can increase volume and reduce cost in ways that would not be possible in a captive cost center"

Joseph T. Lower
VP of Corporate and Strategic Development, Boeing

Boeing does things differently. "We have partnered with organizations who we believe can increase volume and reduce cost in ways that would not be possible in a captive cost center," says Joseph T. Lower of Boeing. Some of these facilities were previously part of Boeing itself, whereas others are owned by partners such as Fuji Heavy Industries and Mitsubishi Heavy Industries of Japan or Finmeccanica of Italy. By pursuing this strategy, Boeing has been able to spread the huge costs of product development while lowering costs by relying on much larger and more diversified production facilities. Being less vertically integrated means that the company no longer has to invest to ensure that the company has state-of-the-art production facilities across the whole spectrum of its product requirement. "We no longer have to be best in class in electronics, wire bundles and floorboards, but can concentrate on predicting and meeting customer demand as cost effectively as possible," Mr Lower adds.

Although OEMs can reduce their inventory costs by outsourcing more production to suppliers, this can mean big adjustments for suppliers. Whereas the aircraft industry is a special case because of the very long lead times, suppliers in most sectors have to be able to supply batches of components at very short notice. To do this, flexibility is often more important than scale. Take the Hungarian operations of Visteon, the U.S. automotive component maker. According to Gabor Bognar, Head of Operations in Hungary, "In the past it was always about putting down a huge chunk of capacity, automate it, and then justifying the investment." Such a strategy is no longer viable, however.

"Any company that is not practicing lean manufacturing right now will fold. It is absolutely essential. Reliance on old manufacturing techniques is not an option."

Steven Leece
Managing Director, Moog

Companies need to adopt lean, flexible production techniques that can enable them to respond to rapid changes in global demand in a timely manner. As Steven Leece, the Managing Director of the Philippines operation of Moog, a U.S.-headquartered precision component manufacturer, says: "Any company that is not practicing lean manufacturing right now will fold. It is absolutely essential. Reliance on old manufacturing techniques is not an option."

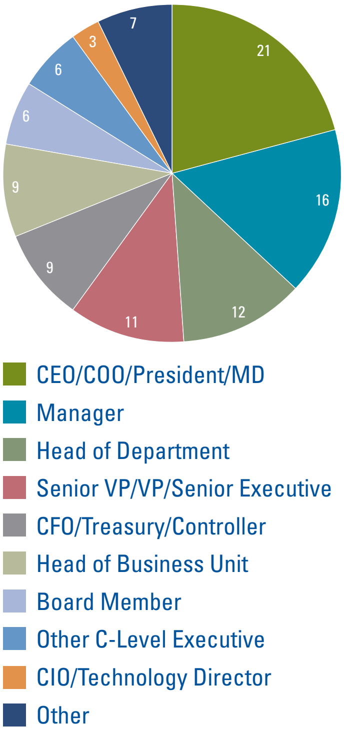
Conclusion
(by Economist Intelligence Unit)

There is plenty for manufacturers to be optimistic about, even those based in North America and Western Europe. The global economy is expanding quickly, driven by a rapid rise in world trade. While companies have to confront new competitors in their home markets, as well as intense competition in foreign markets, there are also substantial opportunities to expand in domestic and overseas markets.

New opportunities are often accompanied by new threats. As manufacturers expand into a greater number of markets, inevitably the risk environment in which they operate becomes more complex. One side effect of globalization is that manufacturers will need to review their strategies for governance and risk management: as shown by the survey respondents, for example, manufacturers are increasingly concerned about their exposure to macro-economic risks. Creating a more dedicated risk function, led by a senior-ranking executive, could help companies achieve a more focused and integrated approach to managing this broad array of risks.

Above all, manufacturers in high-cost locations will have to innovate in order to survive. This is likely to entail companies taking a long-term perspective on investment decisions and carving out areas of expertise where they can command high-end prices. Companies must also focus on ensuring product innovation is tightly connected with customer demands, and that new inventions are brought to market with increased speed and efficiency. For manufacturers in developed markets, continuous innovation will be a primary defense against increasing competition from China and other emerging-market players.

Which of the following titles best describes your job? (percentage respondents)



Source: Economist Intelligence Unit survey, 2005

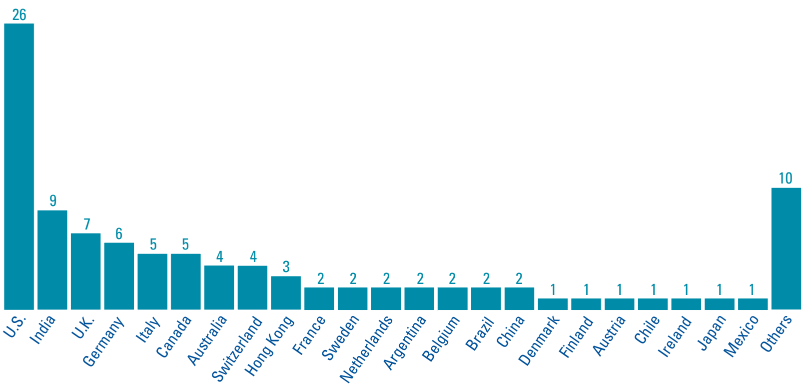
Who took the survey?

A total of 232 executives participated in the survey. The U.S., India and the U.K. provided the largest number of respondents, and there was a good response from all the major industrialized and emerging economies.

Senior-level executives dominated the group of respondents. Almost half the respondents were C-level executives or board members; the remainder were senior managers.

Consumer goods, automotive and electronic and electrical equipment makers accounted for around 60 percent of the respondents. Most of the others were distributed across the mechanical engineering, metallurgy, machine tools and aerospace sectors.

Where is your company headquartered? (percentage respondents)



Source: Economist Intelligence Unit survey, 2005

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