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A special report by The National
Center for the Middle Market

Middle Market Manufacturing

How to thrive in a transforming environment

In partnership with:





Mike Williams
EVP, Manufacturing Industry
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“With so many intersecting, overlapping, and simultaneous changes taking place in the manufacturing environment, companies require new strategies to manage and mitigate risks so they can free up resources to better take advantage of emerging opportunities.”



Tom Stewart
Executive Director, National
Center for the Middle Market

“The competitive challenges of talent, trade, and technology all come together in manufacturing. The best mid-sized manufacturers are showing how to turn new challenges and risks into new markets and rewards.”

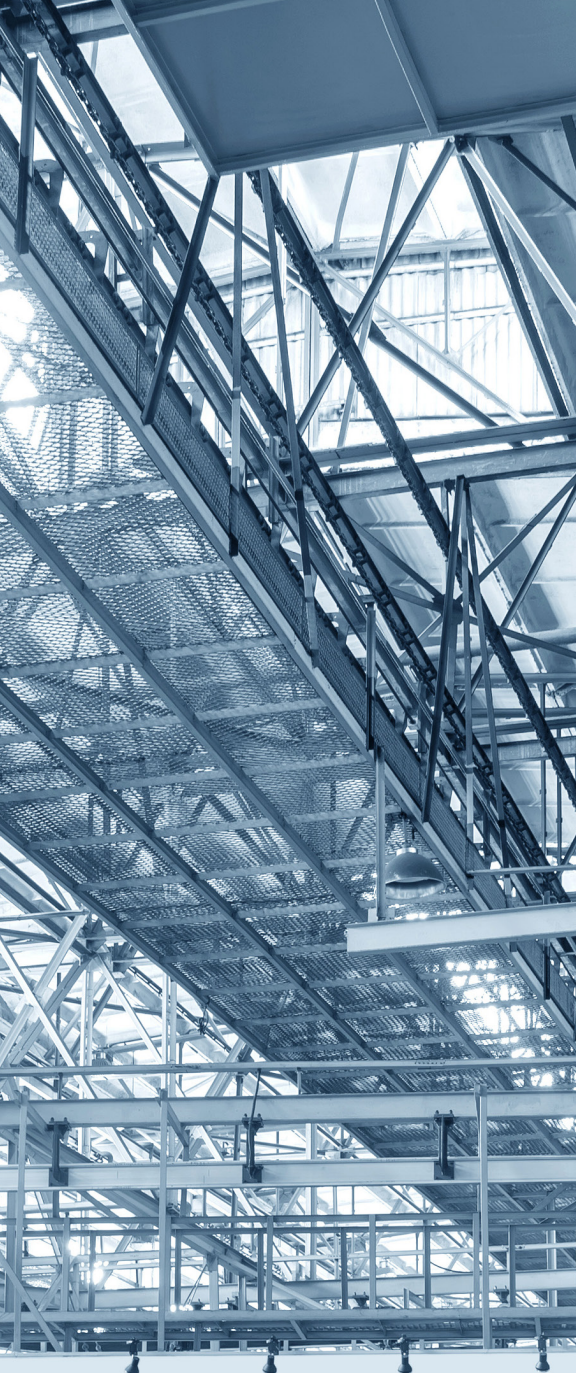


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About This Report

The U.S. middle market over-indexes on manufacturing: Manufacturers represent approximately 17% of middle market companies compared to about 12% of the economy as a whole. Clearly, manufacturing is key to the success of the middle market, which in turn, drives the overall U.S. economy.

While middle market manufacturing is growing and the business climate has markedly improved, these businesses currently face a unique set of challenges to the way they operate. This report serves to better understand the environmental conditions, challenges, and opportunities middle market manufacturers

currently face and to uncover what actions the best-performing middle market manufacturers are taking to mitigate new risks and capitalize on new opportunities resulting from the evolution in the industry. The report presents key findings and best practices manufacturers can use to navigate the shifting components of the environment and identify strategies for continued growth and success.

How the research was conducted

The National Center for the Middle Market worked with experts from Chubb as well as its sponsors, SunTrust Banks, Grant Thornton, and Cisco

Systems, and faculty advisors from The Ohio State University Fisher College of Business, to review research and data and understand the broad challenges middle market manufacturers face. On this basis, the Center then interviewed 250 strategic and financial decision makers from middle market manufacturing companies. Respondents were roughly evenly split between Component Parts Manufacturers (CPMs) and Original Equipment Manufacturers (OEMs). They replied to a 20-minute self-administered online survey conducted between March 26 and April 6, 2018.

Executive Summary

The business climate for middle market manufacturers has improved markedly since the end of 2015, and the manufacturing segment has experienced steady growth in both revenue and employment. But with this growth has come a number of critical and interconnected challenges that have caused manufacturers to rethink and evolve virtually every aspect of their operations.

Mounting competition and globalization, rising costs, and skills shortages are urgent issues that each influence the others, making the overall challenge

significantly greater than the sum of any one part. This has resulted in a manufacturing environment that is much more complex today than it was five years ago. At the same time, technological advancements, increasing collaboration among businesses in the same value chain, and changes to product and service mix offer manufacturers new paths to winning, as long as the challenges can be mastered.

While middle market manufacturers have new opportunities—new markets to serve, new ways of winning and keeping customers, and new flexibility

in operations—they also confront new exposures for which they may not be fully prepared. These include financial and competitive challenges, safety and cybersecurity risks, regulatory and political uncertainty, and talent and workforce development problems. With a better understanding of the increased potential for growth and how to manage and mitigate new risks, U.S. middle market manufacturers can position their businesses to continue to excel and achieve new levels of performance.

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Risk and Opportunities: Navigating the Changing Landscape

With so many intersecting, overlapping, and simultaneous changes taking place in the manufacturing environment, companies require new strategies to manage and mitigate risks so they can free up resources to better take advantage of emerging opportunities. Indeed, some challenges manufacturers currently face are viewed as both a downside risk and

an opportunity to move the business forward: For example, manufacturers see great opportunity in advanced manufacturing, which also exposes them to greater cybersecurity risk. Overall, competition, talent management issues, and costs pose the greatest threats. Smart mitigation or protection strategies for managing these risks can enable companies to better focus on their

opportunities: implementing advanced manufacturing techniques, enhancing customer relationships, and evolving their mix of product and services.

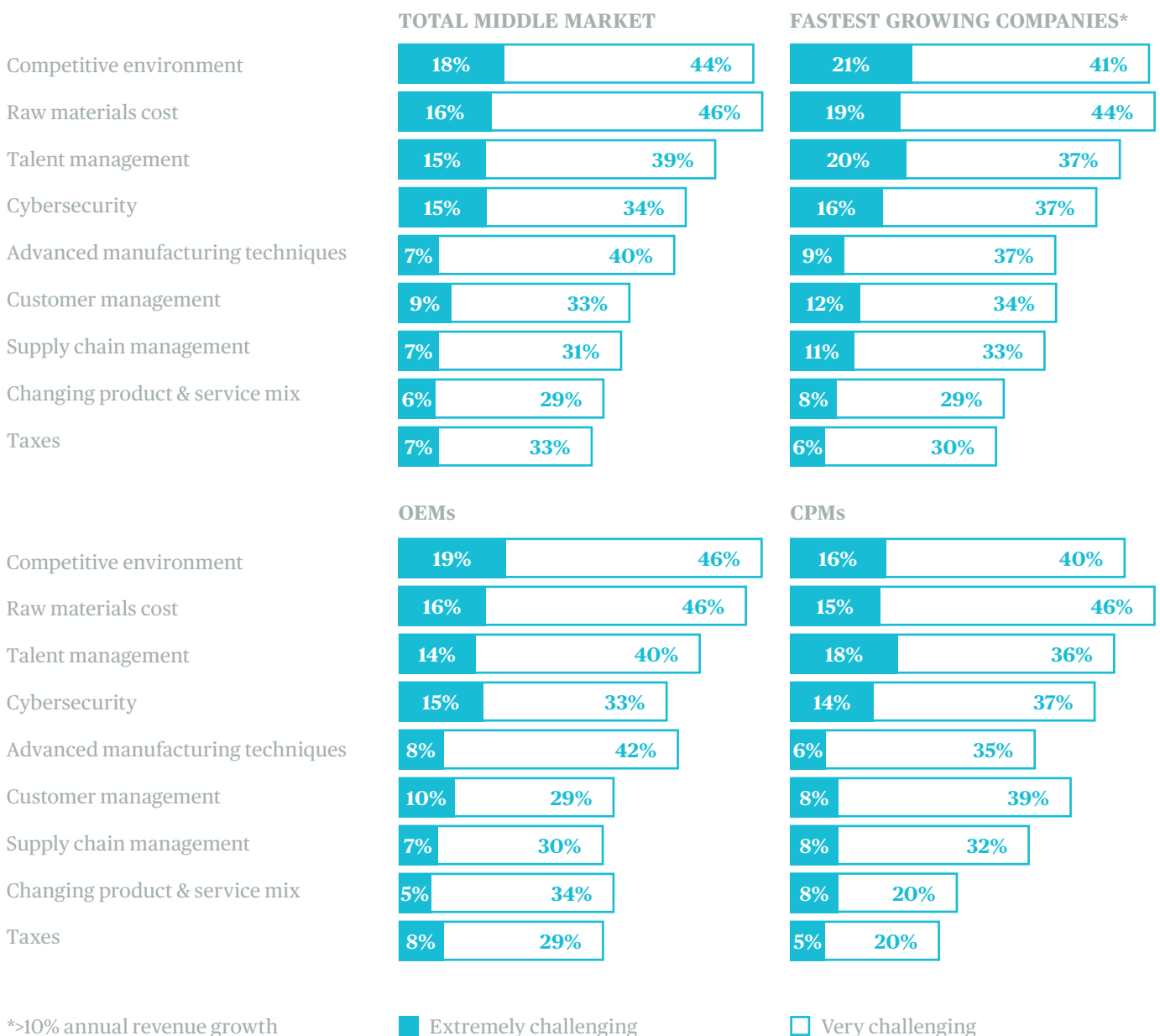
Companies that are embracing new technologies, integrating more with suppliers and customers, adding new services, and becoming more global are growing faster than their counterparts.

A MAJOR OPPORTUNITY		A MAJOR RISK
22%	Implementing advanced manufacturing techniques	5%
14%	Customer management	6%
12%	Changing product and service mix	2%
11%	Supply chain management	5%
10%	Competitive environment	25%
8%	Talent management	16%
7%	Raw materials cost	12%
4%	Using IoT in manufacturing	2%
3%	Taxes	5%
3%	Trade policies	7%
3%	Accessing capital	5%
3%	Cybersecurity	8%
1%	Environmental and sustainability issues	2%

Manufacturers' Challenges

Manufacturers cite a host of challenges that impact business performance. They range from generic issues like taxes to more industry-specific concerns, such as the cost of raw materials and the impact of trade policies. The issues can be clustered into five major categories: competition, upstream and downstream relationship management, product and service mix, technology, and talent. While manufacturers describe the individual issues as highly challenging in their own right, when the issues combine (rising costs in a highly competitive environment, for example) they become that much more complex to navigate.

Business Challenges Facing Middle Market Manufacturers





Middle market
manufacturers face
increasingly intense
competition driven
by globalization and
consolidation.



1

Margins are under pressure

The vast majority—86%—of middle market manufacturers say the business environment is more competitive today than it was five years ago. This is especially true for original equipment manufacturers, who list competition as their number-one business challenge. However, component parts manufacturers feel the pressure, too. CPMs are particularly affected by globalization, the number-one

2

Manufacturers must innovate across product mix, technology, and service

factor contributing to the intensified competition in the industry. For OEMs, consolidation of suppliers and competitors is just as much of an issue as globalization. Customer consolidation is having an impact as well.

The squeeze of competition all along the value chain is putting tremendous pressure on costs. The cost of raw

3

Globalization is driving increased competition

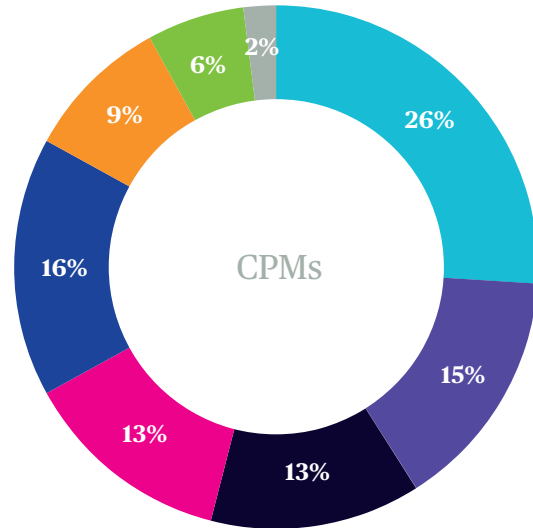
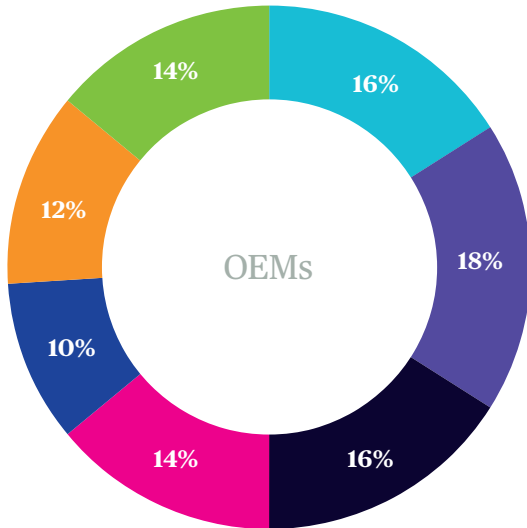
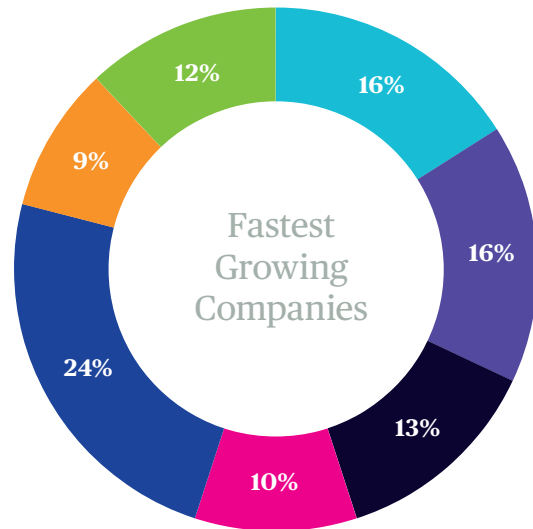
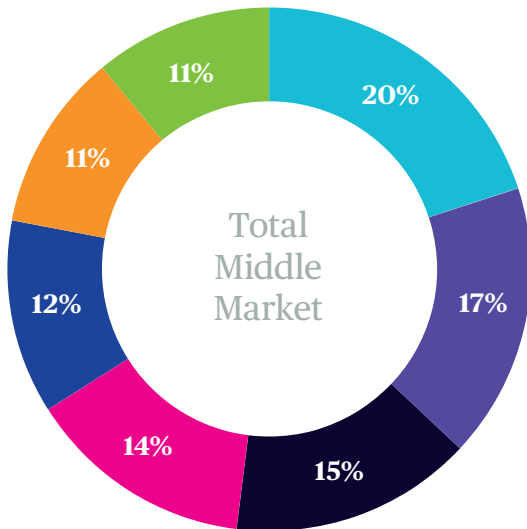
materials ties competitive environment as a top business challenge, and for CPMs, costs are the biggest headache right now. Manufacturers are also worried about the impact of potential tariffs, and competition is making it difficult for manufacturers to pass on costs in the form of price increases. Manufacturers must find other ways to make up or cover the additional expenses.



Risk Spotlight

Globalization represents one of the greatest areas of challenges for manufacturers. As operations expand overseas, it is critical to ensure that your insurance program contemplates exposures for employees travelling overseas as well as coverage for owned and leased facilities.

What is having the biggest impact on the competitive environment?



- Globalization
- Consolidation of customers
- New competitors from other industries
- Consolidation of firms like yours
- Businesses like yours expanding
- Consolidation of suppliers
- Disruptive entrants
- Other



Manufacturers' relationships with suppliers and customers are increasingly interdependent.



1

Supply-chain customers demand greater speed and transparency

As consolidation along the value chain drives increased competition in the industry, it's changing the nature of both upstream and downstream relationships for middle market manufacturers. The majority of manufacturers, and particularly CPMs, say collaboration has increased with their suppliers and—especially—with their customers over the past five years. The fastest-growing manufacturers are strengthening relationships both up and downstream to a greater extent than their slower-growing peers.

2

CPMs and OEMs are forging increasingly collaborative relationships and growing faster as a result

At the same time, and due in part to this increased collaboration, 71% of all manufacturers (and 88% of the fast growers) believe their role in the supply chain has become increasingly important in recent years. Just-in-time inventory management and tightening timelines make it more critical than ever for manufacturers to hit deadlines. As customers demand more speed, more reliable cycle times, and more transparent relationships, manufacturers are expecting the same from their suppliers.

3

Integration between suppliers and customers is on the rise

All of these factors have led to greater integration between suppliers and customers and with providers of third-party logistics, IT, and financial services—a trend that we also saw among the fastest-growing middle market companies in *The Perfect Link*, our supply chain report published in 2017.



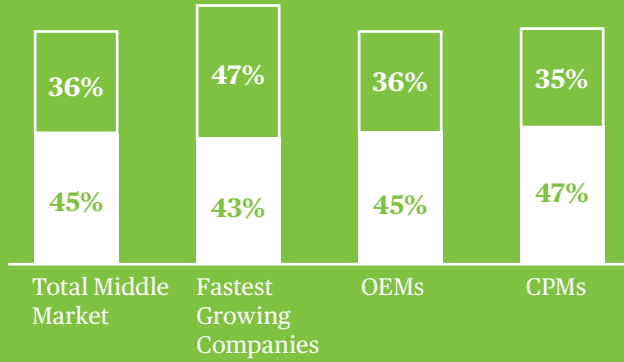
Risk Spotlight

As collaboration between suppliers and customers increases, the amount of sensitive data stored and transacted between parties may be susceptible to a cyberattack. However, many do not consider this type of exposure as part of their insurance program. A solution that includes broad cyber insurance and knowledgeable risk engineering services can help address a breach if one occurs and, more importantly, prevent one from happening in the first place.

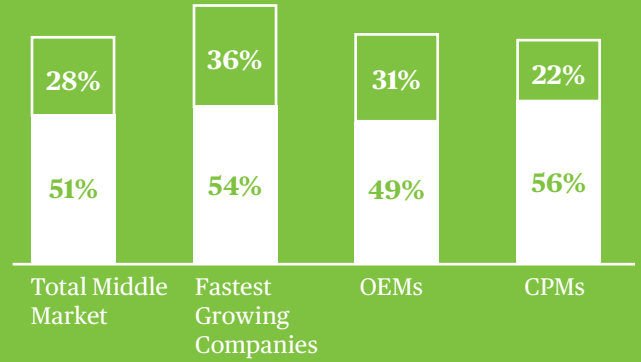
Supply chain perceptions

Speed

Our customers expect faster cycle times now than they have in the past

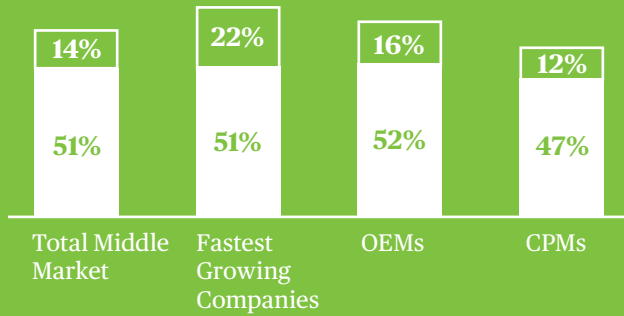


We expect faster cycle times from our suppliers than we have in the past

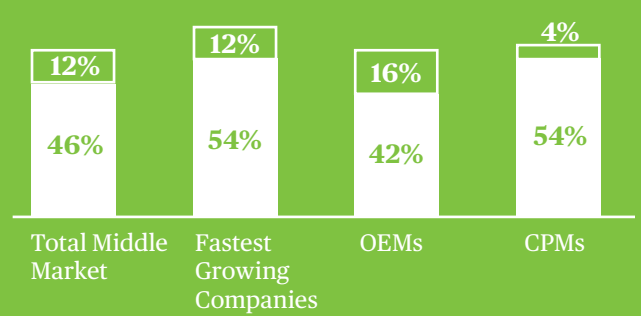


Digitization

Digitization has made supply chain management simpler

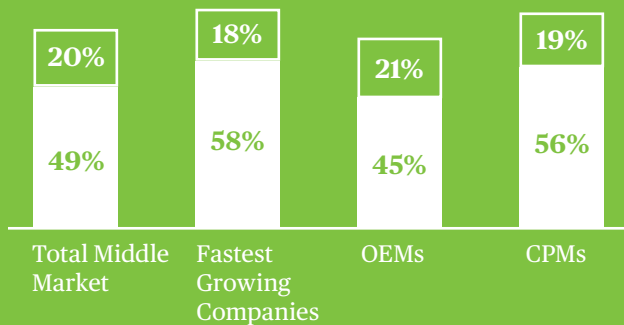


Digitization of the supply chain has resulted in shorter timelines

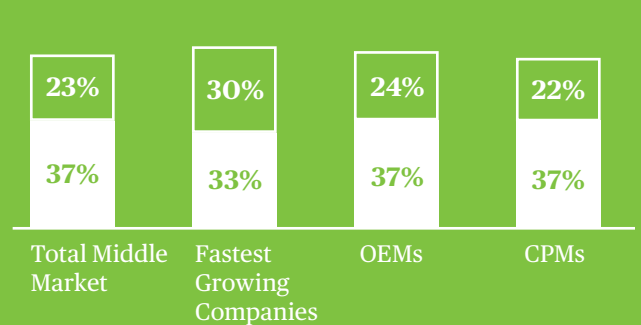


Policy & Regulation

Regulations make supply chain management more complicated



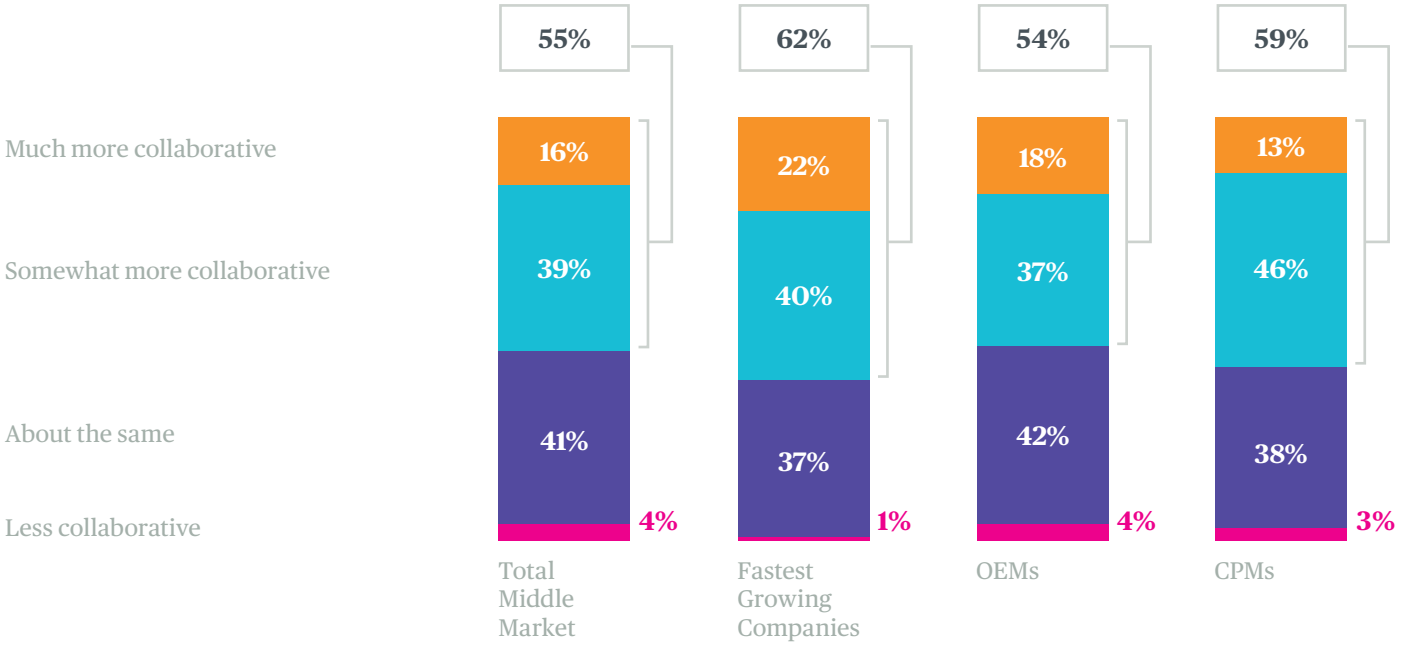
Import tariffs would likely have a major negative impact on our supply chain



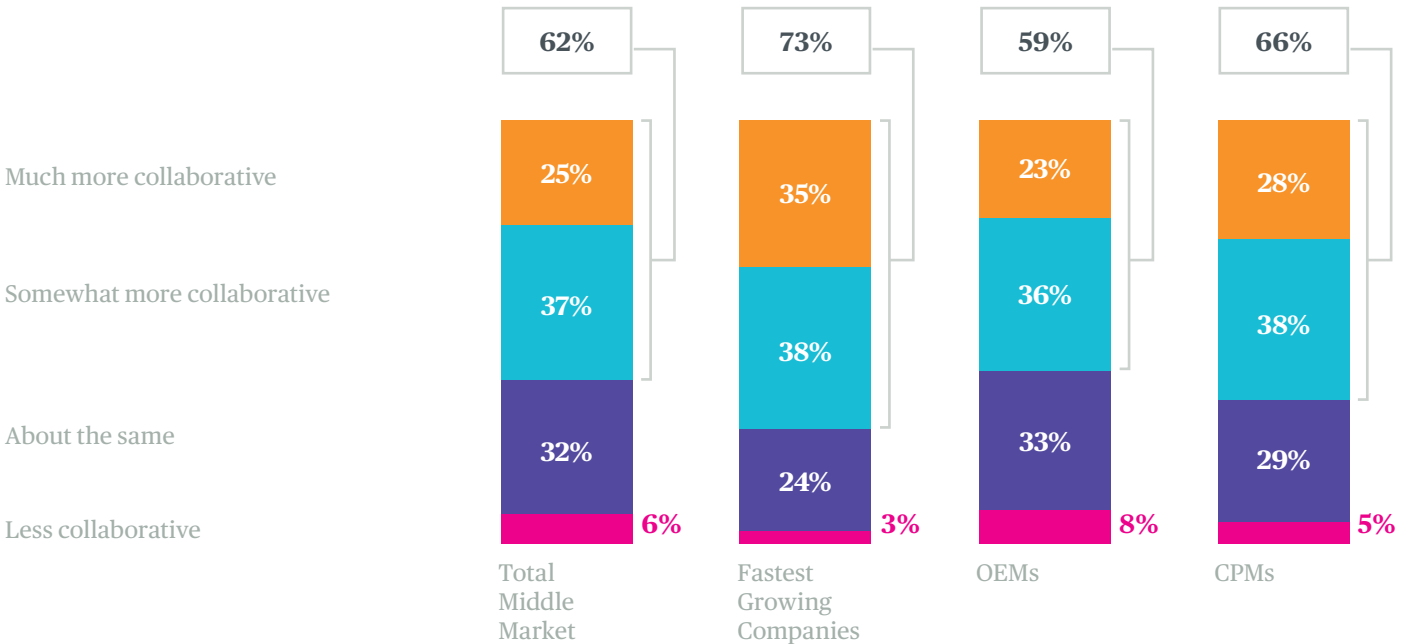
Agree completely
 Agree somewhat

Change over past 5 years

Relationships with Suppliers

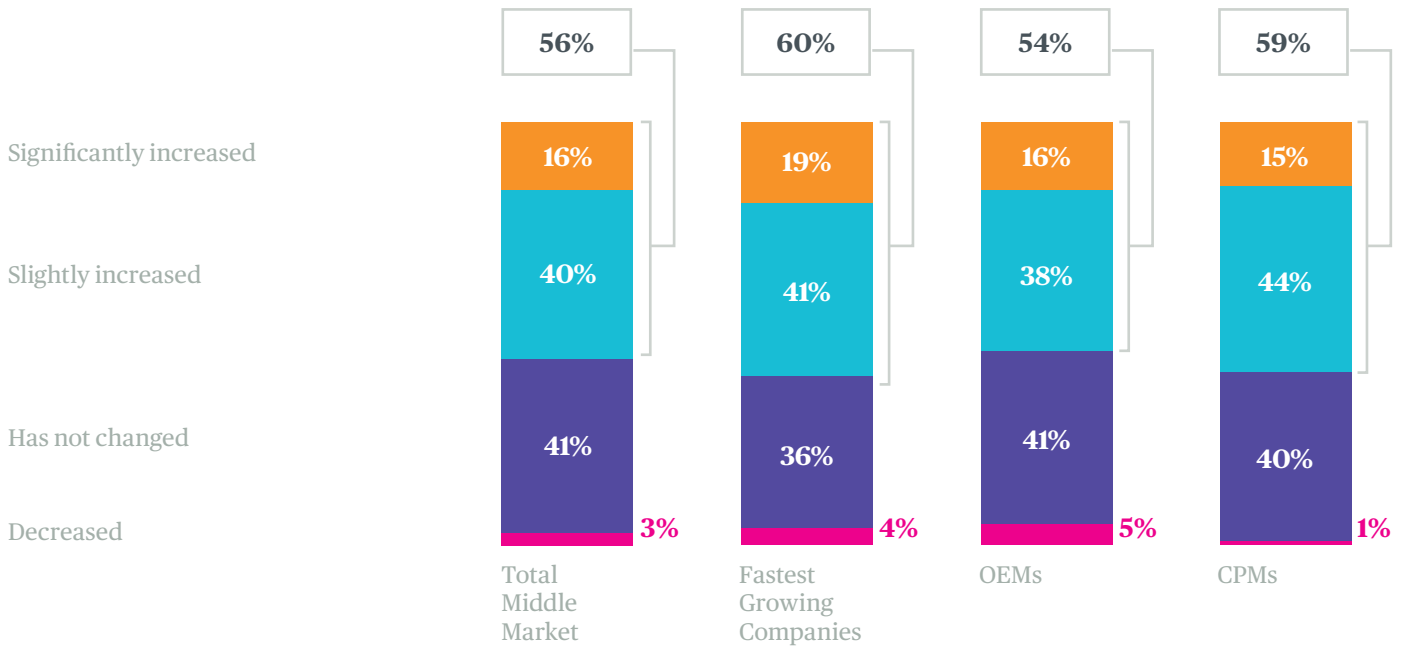


Relationships with Customers

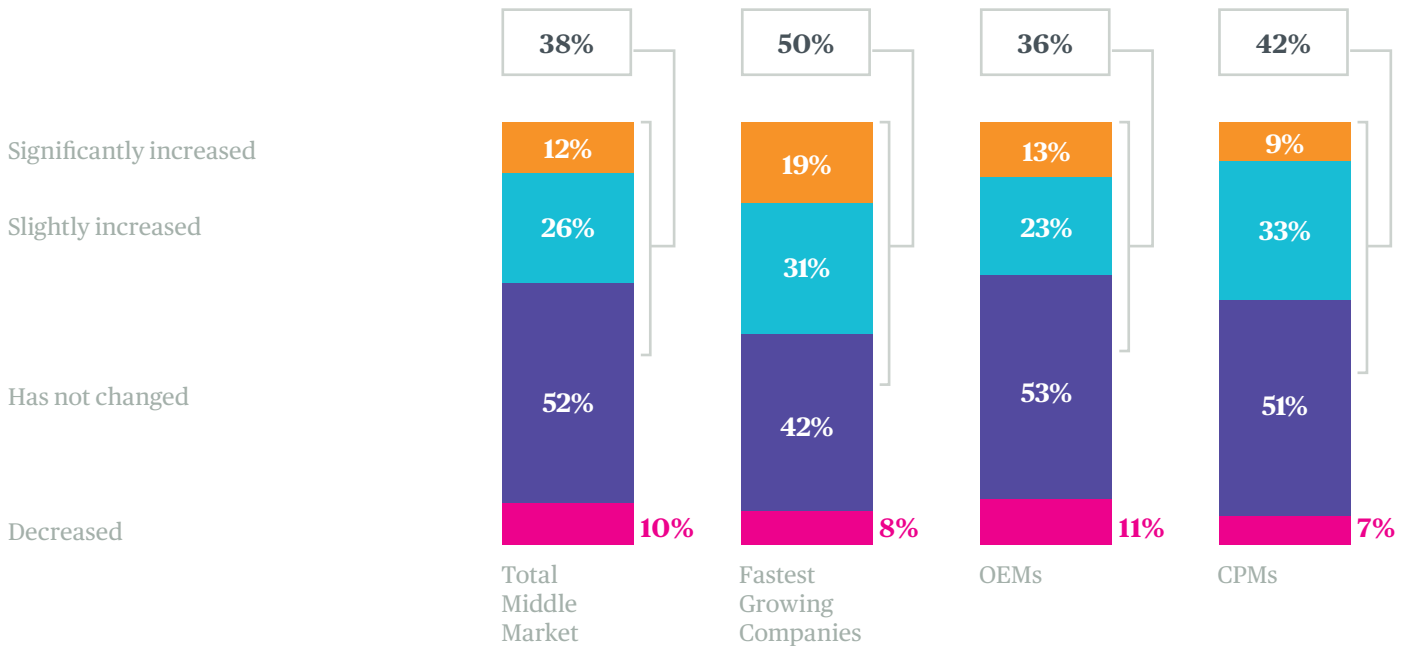


Change in integration over past 5 years

Upstream



Downstream





Manufacturers
are changing
their product
and service mix.



1

A majority now offer value-added services

As supply chains integrate and competition mounts, middle market manufacturers are switching from a product-only model to selling value-added services in order to stand out in the market, solidify customer relationships, and bring in more revenue. These offerings may include installation, maintenance, financing, consulting, and more. More than two-thirds of manufacturers, OEMs in particular, have added services or “solutions” to their offering in the past five years, and half of these businesses say they generate more revenue as a result—17.1 percentage points more on average. Additionally, this group experienced year-over-year revenue growth of 9.7%, compared to 5.7% for all others. Among the fastest-growing middle market manufacturers, nearly four out of five have added services or solutions, and 62% have enjoyed boosts in revenue.

2

Product lines have become somewhat less diversified

Product mix is evolving, too. Overall, the industry is moving toward specializing on a more focused product mix—being the best at fewer things—but this trend is not universal. While 44% say they have become more focused, 36% say they are more diversified. Overall, diversification seems to drive faster revenue growth, especially for CPMs. Looking forward, diversified manufacturers make stronger revenue growth predictions for the next 12 months than focused manufacturers. Top-line growth is not the same as profitability, of course, and it is possible that the more focused group places more emphasis on profits.

Given advancements in technology, smart products—products equipped with microchips, sensors, and other electronic components that allow them to communicate with other products or services—are coming off many manufacturers’ production lines, and are

3

“Smart products” are steadily entering the market

being planned by many other companies. About three out of five manufacturers produce some smart products, but these devices typically make up less than 25% of the product mix. Fast-growing manufacturers are somewhat more likely than slower-growing firms to produce intelligent devices. Companies that do make smart, connected devices for the so-called Internet of Things (IOT) boast faster revenue growth and have healthier predictions for growth in the future.

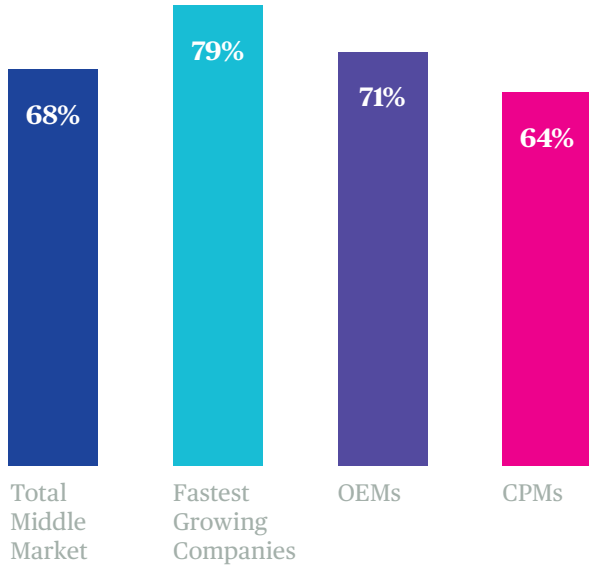
With most manufacturers changing products or adding services or both, companies must rethink their business models and talent mix in order to support their new offerings. They may be exposed to new risks and liabilities. They probably need new capabilities, new types of selling skills, and new ways of measuring profitability and productivity, adding yet another element of change to the equation.



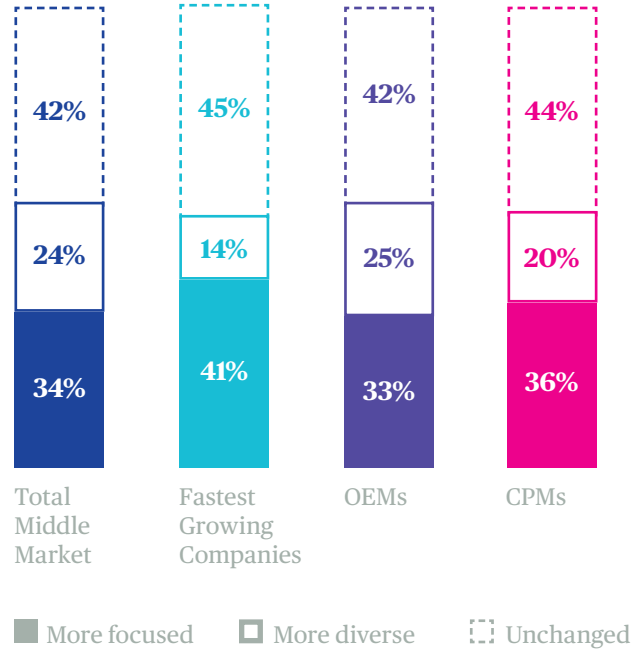
Risk Spotlight

In light of manufacturers switching from a product-only model to one that also includes a service offering, it is important to protect against financial injury that could result from a product or service not meeting customer standards. While warranties or contractual remedies exist, they alone cannot replace the lost revenue or reputational damages due to an actual or alleged product or service defect or failure to perform. An Errors and Omissions solution can help to fill this often overlooked gap in an insurance program.

Have begun offering value-added service in past 5 years



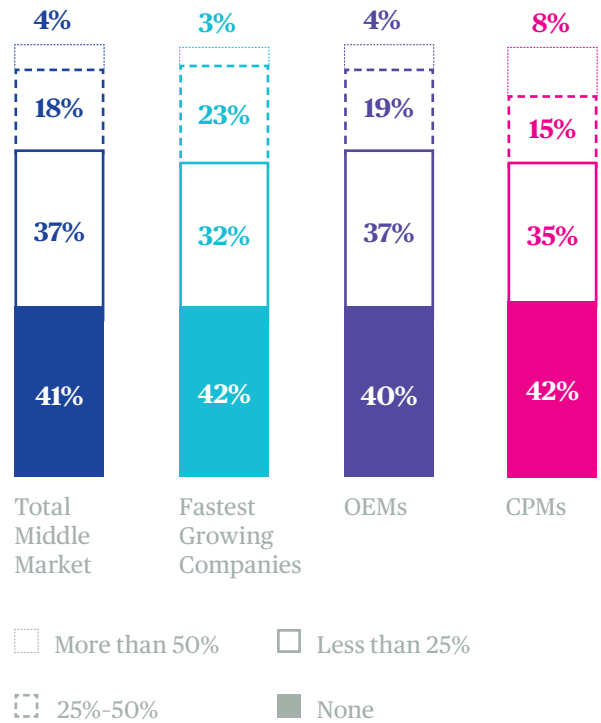
Change in product mix over past 5 years

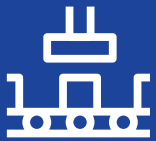


Change in revenue from value-added services

More revenue	50%	62%	50%	51%
Same revenue	45%	36%	44%	46%
Less revenue	5%	2%	5%	4%
Average change	8%	12%	8%	8%
	Total Middle Market	Fastest Growing Companies	CPMs	OEMs

Proportion of output consisting of "smart products" (IoT)





Technology is rapidly changing factory floors and manufacturing processes.



1

Technological advances positively impact productivity and growth

Technology has altered not only what manufacturers make, but how those items are made.

Most executives believe technology advances are a good thing. Over the past year, they have invested most heavily in new materials, advanced process controls, and robotics and automation, along with cybersecurity. Nearly all—90%—say the impact of these technologies has been positive, and they believe they will continue to foster greater productivity, enable more customization, and allow for growth.

Looking ahead, priorities will change. Cybersecurity will become increasingly important to manufacturers as older machines that were not built for security are now being connected, with the result that cybersecurity is considered the most important area for technology spending in the

2

Wearables are becoming more prevalent

coming year and over the next five years. New materials and advanced process controls will also be major areas of investment and importance for companies moving forward, especially fast-growing businesses. Indeed, technological advances have introduced a bit of an upgrade challenge—the need to keep up with a rapidly advancing productivity frontier, which Harvard Business School professor Michael Porter defines as the “sum of all existing best practices at any given time.” The fastest growers are placing greater importance on a variety of advanced manufacturing techniques, and those that embrace technologies most effectively will have an edge going forward.

Advanced technology means retooling factories. It will increase companies’ need for capital. Smart factories and integrated supply chains will also

3

Cybersecurity will become increasingly important

raise security risks because “air gaps” between processes will disappear. But they will convey tremendous benefits, too. Productivity increases are foremost among them, followed by the ability to increase customization.

Interestingly, many manufacturers (45%) believe technological advancements won’t change the size of their workforce, and the remaining 55% are equally split between companies that think the workforce will need to grow and those who forecast employment will shrink.

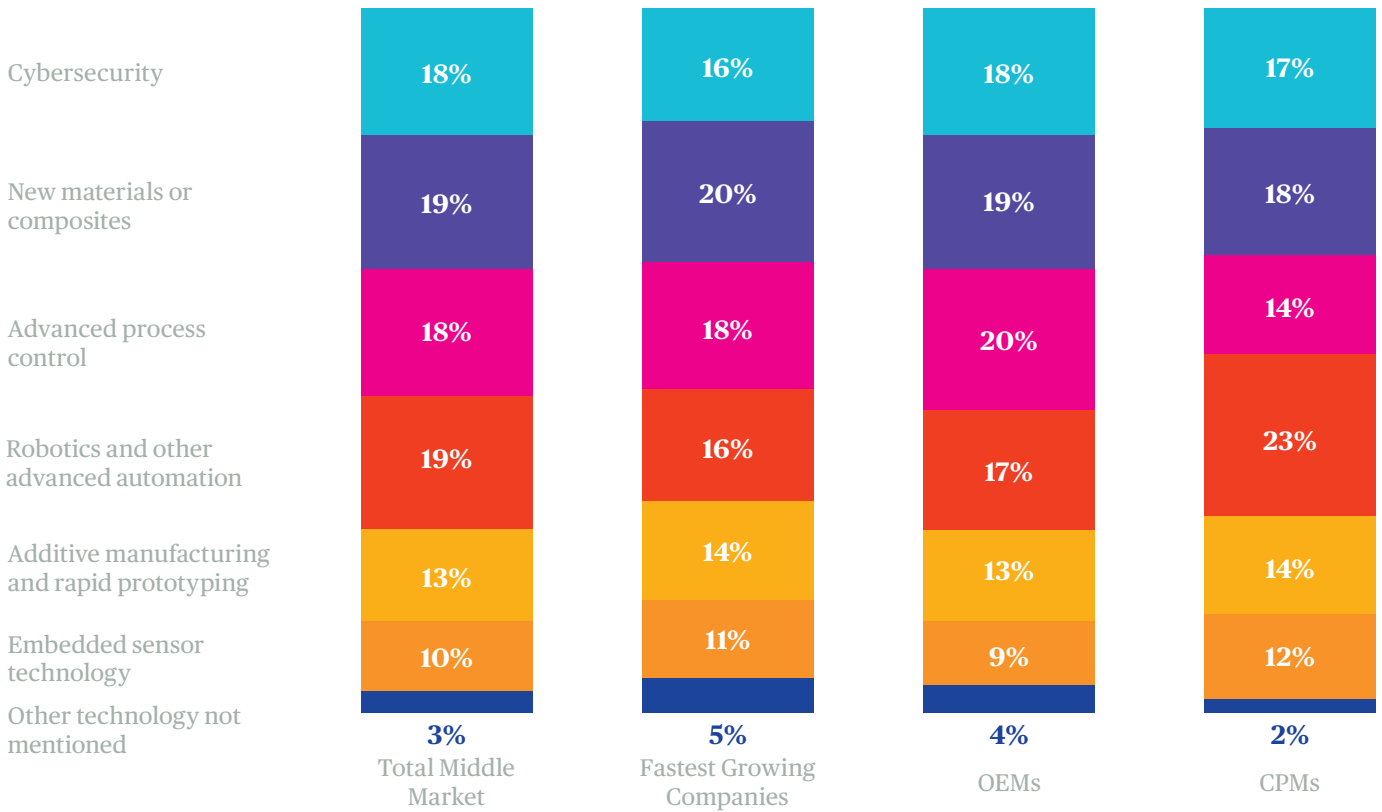
IoT technology is also becoming more prevalent in manufacturing and distribution, mostly to measure environmental conditions or vehicle driving speed and distance, and, to a lesser extent, to monitor employee location and movement. Heavy users of IoT wearables tend to be larger, faster-growing companies.



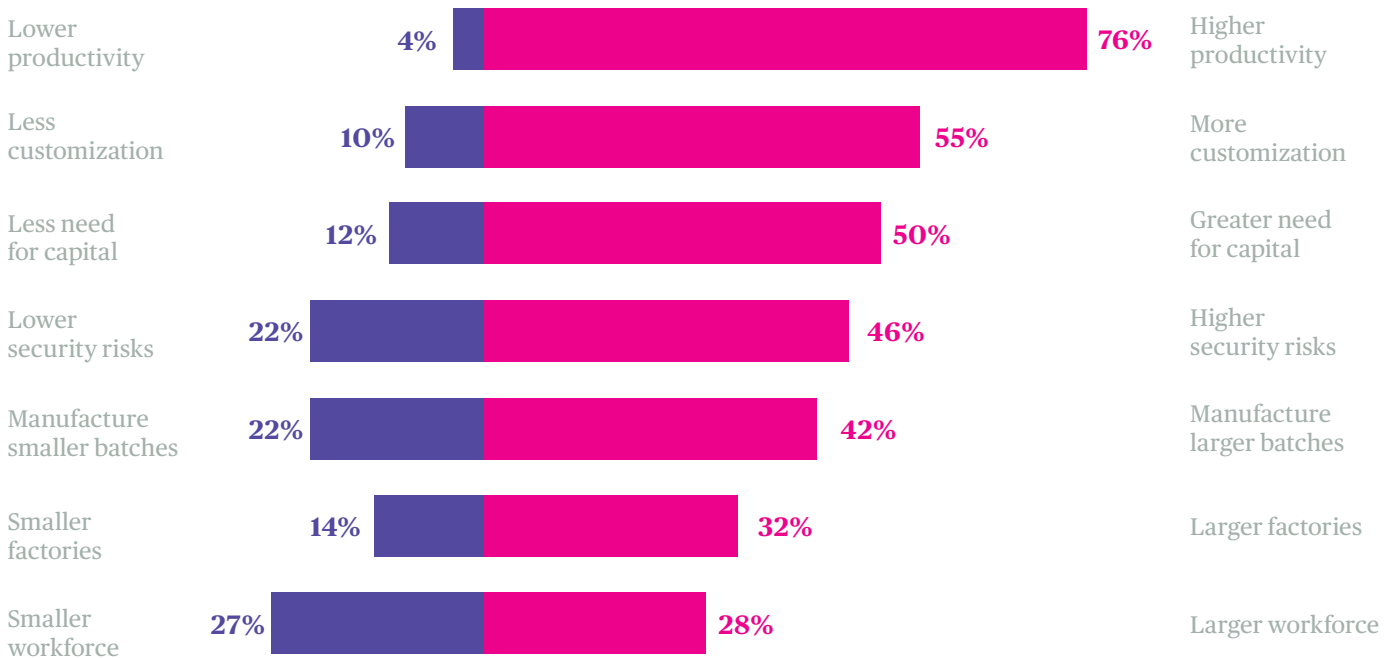
Risk Spotlight

The physical and digital worlds are increasingly interconnected in manufacturing as Operational Technology (OT), Information Technology (IT), and the Industrial Internet of Things (IIoT) collide. As companies implement automation, robotics, IoT, and other sophisticated manufacturing techniques, new risks emerge. Working with an insurance provider that has deep expertise in these new technologies can help you stay ahead of these emerging threats and develop strategies to mitigate operational risk.

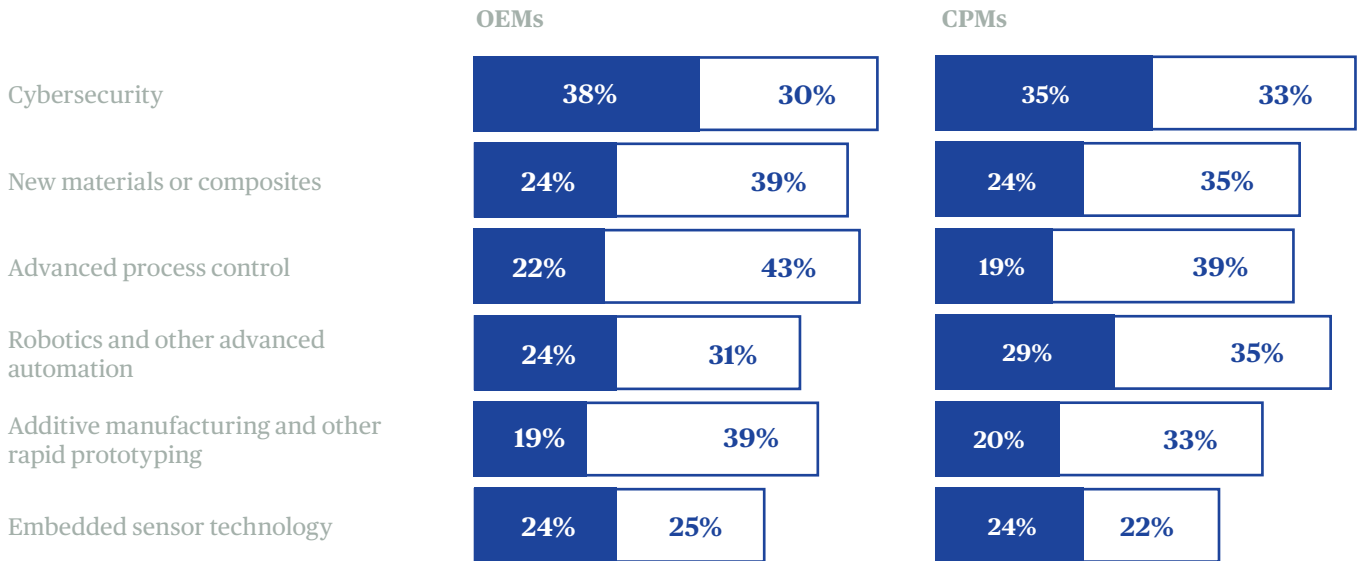
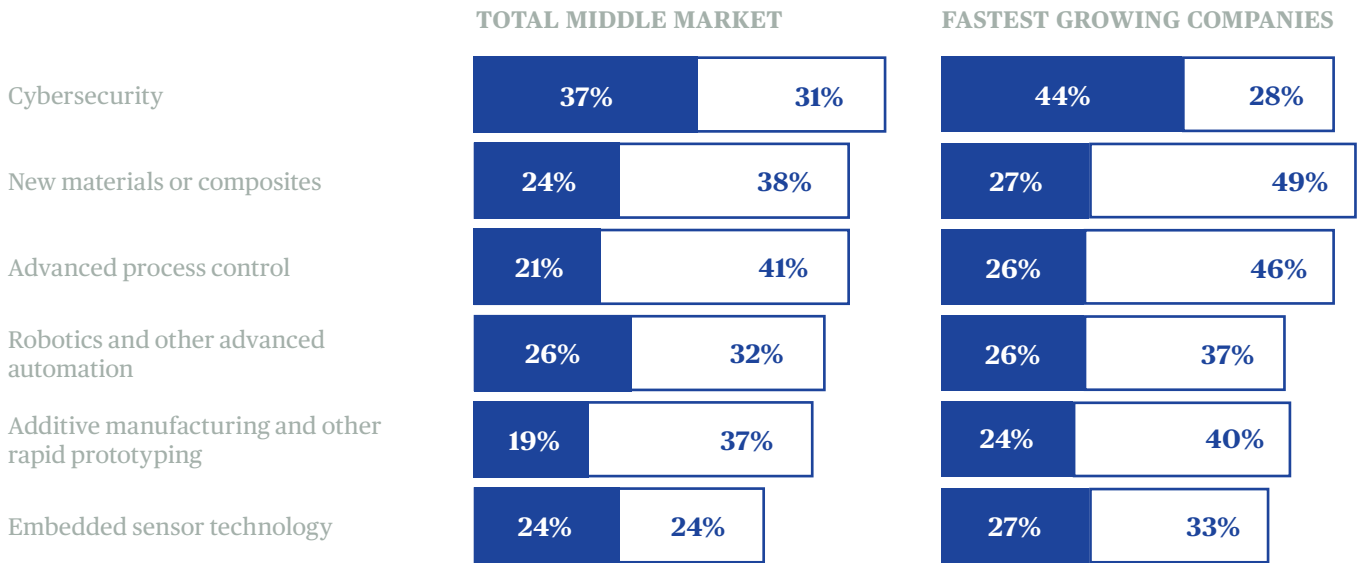
Allocation of technology investments over past year



Impact of technological advancements



Importance of technologies over the next 5 years

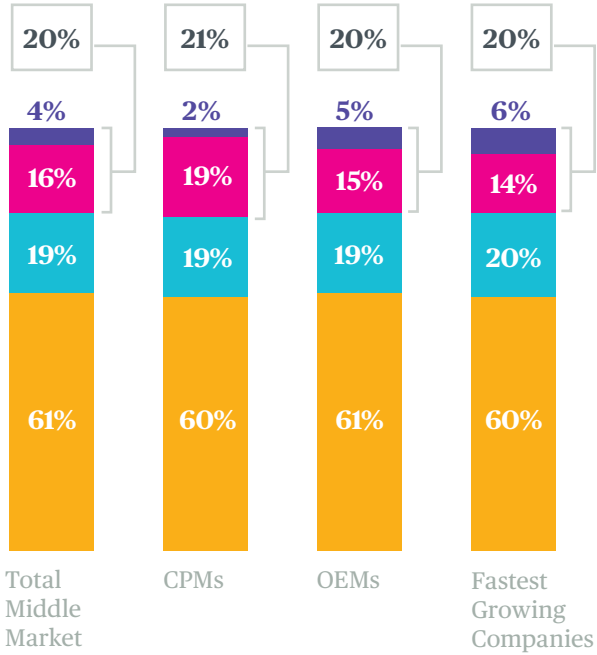


■ Extremely important

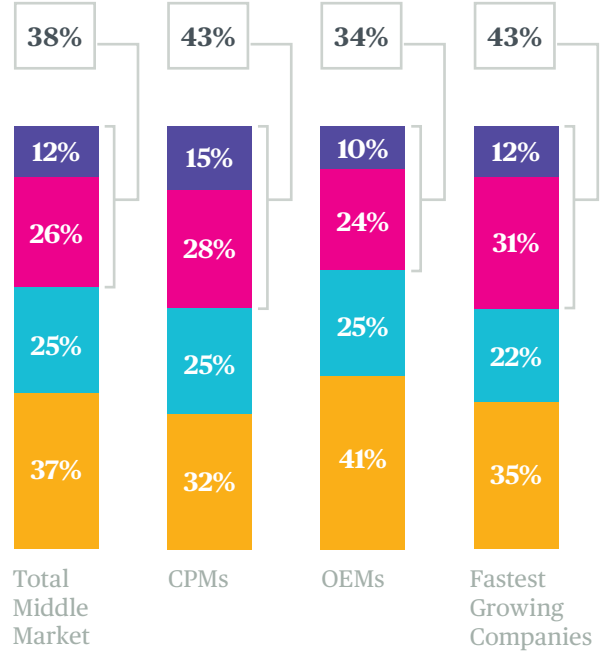
□ Very important

How manufacturers implement wearable IoT technology in the workplace

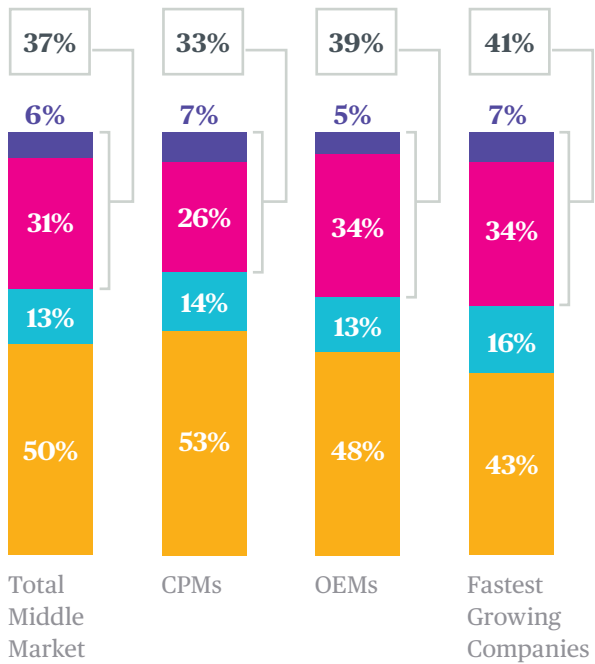
MONITOR EMPLOYEE LOCATION/MOVEMENT



MEASURE ENVIRONMENTAL CONDITIONS



MEASURE VEHICLE DRIVING SPEED OR DISTANCE



- Using for more than 5 years
- Expect to begin using in next 5 years
- Began using in the past 5 years
- Do not expect to use



Talent management issues stem from and compound every other challenge manufacturers face.



1
Finding workers with the right technical skills is difficult

Like middle market companies in all industries, manufacturers say talent management issues have escalated over the past several years. More than half—54%—say talent is a big issue, earning it a top spot on manufacturers’ list of challenges. Manufacturers that are growing the fastest, and probably have more positions to fill, tend to find talent management more difficult than their peers.

This isn’t surprising. Given other changes manufacturers contend with—increasing competition and

2
The fastest growers experience the greatest talent management challenges

globalization, a changing mix of products and new services, an increasingly important role in the value chain, and integrating new technologies—finding people with the right technical skills is a tall order and is far and away the most challenging talent issue, cited by more than two-thirds (64%) of manufacturers. That percentage rises to 76% for the fastest-growing companies.

Other talent challenges—implementing automation, an aging workforce, finding people with vocational or

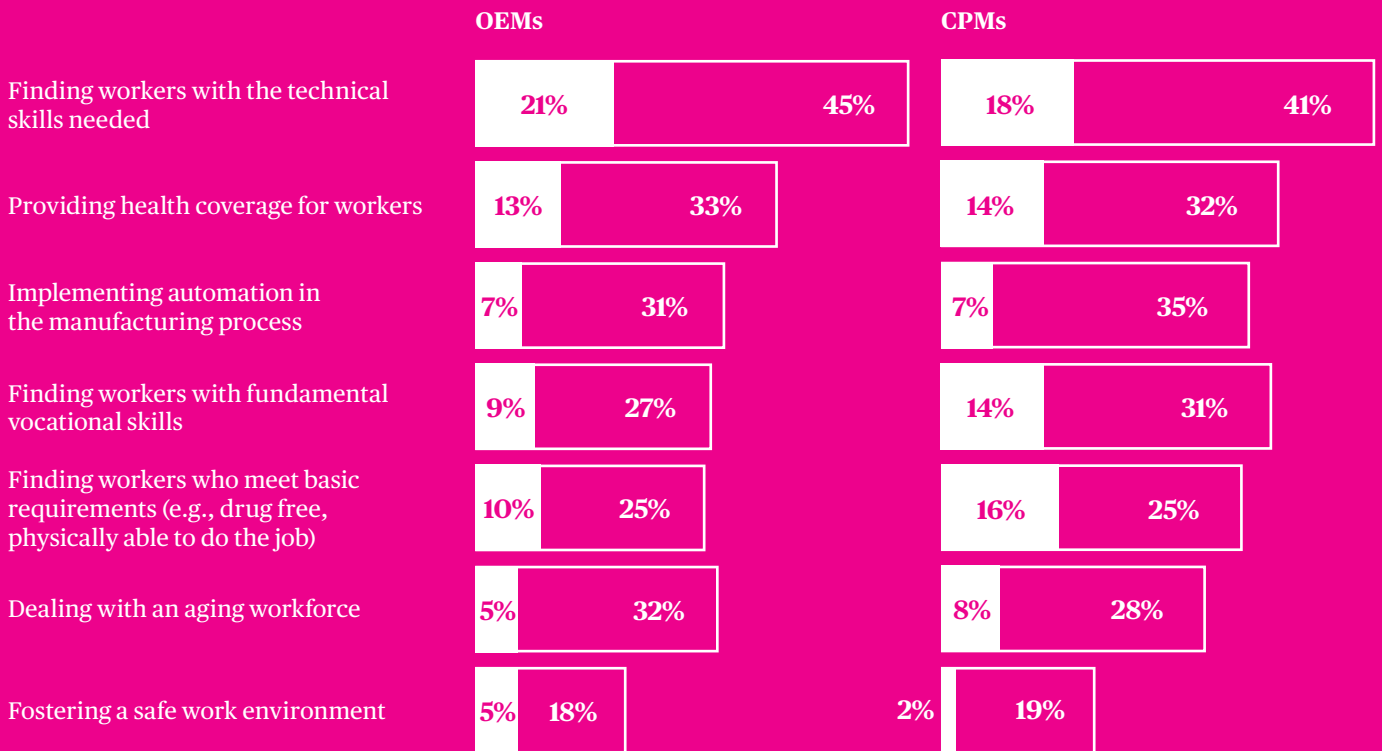
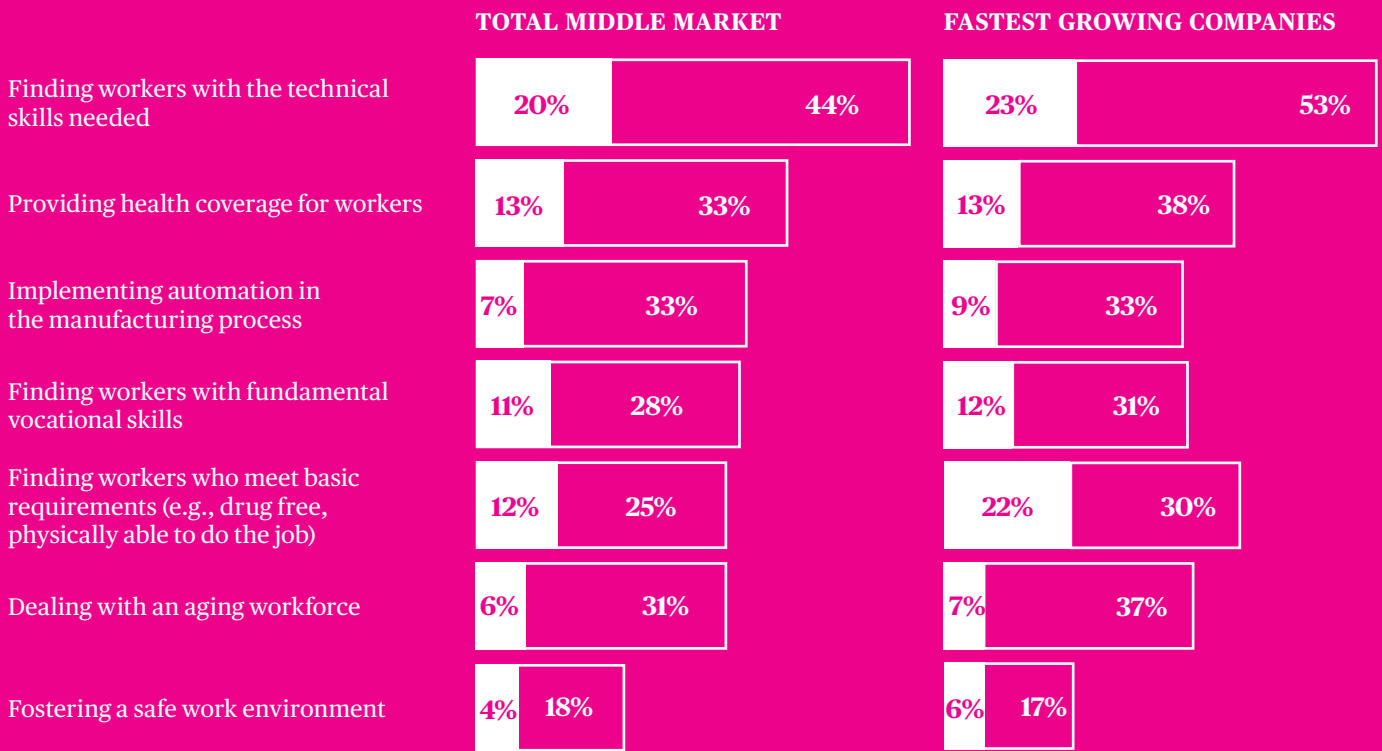
3
The ability to train and grow talent internally is becoming increasingly important

basic skills—come in at about 40% each: formidable individually, almost overwhelming collectively. Executives are responding with expanded outreach to colleges, technical schools, and economic development organizations to increase the labor pool. They also are offering higher pay and benefits for skilled workers, along with more training. In the words of one respondent, “If you can’t hire them, you have to grow them.”

Talent management is a long-term internal challenge



Challenges associated with workforce/workplace



■ Extremely challenging □ Very challenging

Reassessing Risk Exposures

Manufacturers now face exposure to risk that did not exist in their old environment.

Manufacturers can benefit from giving consideration to the following issues and speaking with their business partners, including insurance agents, bankers, advisors and auditors, and lawyers to ensure they evaluate and manage new risks. A comprehensive enterprise risk management strategy is increasingly important—one that is regularly updated to keep abreast of change.

Playing a More Important Role in the Supply Chain Leads to Greater Responsibility.

As manufacturing supply chains become increasingly integrated, turnaround times continue to shrink, and products become more customized, companies' margin for error shrinks. Enterprise resource planning and lean, agile operations become critically important.

The Geopolitical Climate is Increasingly Important.

Globalization requires a greater awareness of customs regulations, currency, and changing foreign and domestic trade policies. Executives may need to learn new forms of governance, such as joint ventures, and add new capabilities and tools to their finance operations, such as understanding currency risks, the use of trade credit insurance, and so on.

Digitization Opens New Doors.

Processes that used to be physical are now digitized, and the products themselves have more technology embedded. Developing, producing, protecting, and maintaining those processes and products and the equipment that makes them are new areas of concern. At the same time, digitization can accelerate new product development and introduction. It also opens opportunities to sell new services (such as predictive maintenance) and gather valuable information that can spark innovation in next-generation products.

Adding New Services Leads to Continuing Responsibility.

Many manufacturers have moved beyond simply delivering a product to installing, monitoring, and servicing it. They are connected with customers and consumers in more ways and for a larger part of the product's life cycle. Their revenues grow from these activities; so do their potential liabilities.

IT and Operations Systems Must Become More Integrated.

Manufacturers can integrate IT and operations (including robotics, process controls, and data analytics) to improve productivity and profitability. IT also should be used to strengthen operations' safety and cybersecurity.



What the Fastest Growing Manufacturers Do Differently

Manufacturing is thriving in the middle market. The average annual revenue growth rate among the 250 companies interviewed for this survey is 7.7%—exactly the same as the growth rate reported by the middle market manufacturers who responded to the Center’s IQ 2018 Middle Market Indicator Survey. According to that same survey, taken in March 2018, middle market manufacturers see the good times continuing—they predict a growth rate of 7.2% for the next 12 months. Historically, companies deliver higher growth than they forecast.

Clearly, then, while manufacturers face complex, intense tests, the best of them have been able to spin challenges into gold. Looking at the actions of manufacturers that reported 10% or higher revenue growth last year, we see:

Competition

The best performers combine strong domestic sales with some (but not too much) global exposure. Purely domestic sellers grew 7.5% in the last year, whereas companies that earned 1-25% of their revenue from abroad grew 8.6%—more than a percentage point higher. The growth rate was a little less (8.2%) for companies whose revenue was 26-50% international. But the most internationalized companies, which earn more than half their sales from foreign markets, grew slowest, at 5.9%.

There may be three lessons in these numbers: First, exposure to demanding global markets improves performance, the way exposure to heat anneals steel. Second, most middle market companies have lots of room to expand domestically, and that growth might be easier to achieve. Indeed—the third insight—pursuing global sales can be risky if it comes at the expense of protecting and expanding a strong domestic base.

Collaboration

Faster growing middle market manufacturers embrace the opportunity to collaborate with customers and along supply chains. Collaborators grew a little more than 9% last year. Collaboration is valuable both upstream and downstream—that is, with suppliers and with customers. But there is also a penalty for non-collaboration, and it is greatest downstream, when companies do not work closely with their customers. Those firms grew just 4.4% last year—less than half as fast as those that are willing to let down barriers and allow their customers to influence product lines and have visibility into operations. (The Center uncovered similar findings in its 2017 study of supply chains, *The Perfect Link*.)

The clear lesson here: Customer relationship management—a mindset, not just a tool kit—is increasingly important for manufacturers. The deeper their connection with customers, the more likely they are to succeed.

Smart Products & Value-added Services

Advanced product and service offerings are associated with superior growth. Companies delivering these offerings experienced year-over-year revenue growth of 9.7%, compared to 5.7% for all others, and 7.7% for the sample as a whole. The services component of these companies’ businesses grew more than 17% last year.

There is almost certainly a link between services and smart products on the one hand and collaboration on the other. Both kinds of new offerings imply a more intimate relationship between a manufacturer and its customers, whether it is sharing data from smart products or installing and servicing products after they have been sold. Managing these new lines of business

requires new sales, marketing, and customer support capabilities. Their performance may need to be tracked in new ways, too; for example, measurements such as return on assets may be meaningful for factory operations, but less relevant to a service arm, which has fewer assets.

Advanced Manufacturing

It is clear that the companies growing most rapidly place greater importance on a variety of advanced manufacturing techniques. Often by wide margins, companies growing 10% or more last year assign more importance to every advanced technique about which we asked.

Talent Management

Talent challenges bedevil the most successful middle market manufacturers more than their less-successful peers. Among fast growers, 68% say talent management is extremely or very challenging. As noted above (page 28), the biggest talent hurdle for manufacturers lies in finding workers with the right technical skills—skills that are also changing for technologically advanced companies. It is easier for the rest, but not much: In the group that is growing less than 10%, or not at all, 58% report severe talent-management difficulties.

The most likely explanation for the difference is simply that fast-growing firms have more positions to fill. As the Center and The Brookings Institution reported (*Help Wanted*, 2017), middle market employers confront a triple whammy: Having relatively unknown employer brands, they do not attract as many over-the-transom applications as larger firms; their lean human resources teams may not have deep capabilities in employee development; and the public-private

system of community colleges, workforce improvement boards, and the like has not been designed to serve middle market companies well. It is interesting—and perhaps heartening—that automation does not seem to provide a path out of this thicket: Companies are as likely to say that advanced manufacturing will cause them to add jobs as to eliminate them.

Embracing the Opportunity

From this study, a picture emerges of a manufacturing sector that is split. Manufacturers whose revenue is stagnant or sinking—about one in five in our sample—are also significantly lagging in their use of new technologies. In the middle, about two-fifths of the sample are steadily

deploying new technologies, chiefly it would seem in pursuit of higher productivity and security. On the other end, companies growing faster than 10% a year—another two-fifths of the group—are ahead in all areas. But the fast growers are particularly likely to emphasize the use of new materials and embedded sensors, which suggests that they are not only manufacturing in advanced ways, but that they are also manufacturing advanced things.

Middle market manufacturers can have little direct influence over a number of the challenges they face, such as industry consolidation, political risk from potentially changing trade policies, overall workforce conditions, and rising costs of energy, healthcare, and raw materials. However, they

can minimize their impact through operational efficiency or negotiation with vendors and service providers.

The data show that the most successful manufacturers are not overwhelmed by the rapidly changing environment; they are energized by it, riding the change to greater success. These opportunities—expanded markets, more collaboration along the value chain, leading-edge products and value-added services, and advanced manufacturing—expose them to new risks that must be understood, mitigated, and managed. But they also expose manufacturers to new revenues. The best in the bunch have demonstrated that the rewards far outweigh the risk.

Importance of technological advances over the next 5 years

REVENUE GROWTH

	10%+	1-9%	SAME/DECREASED
Cybersecurity	72%	71%	52%
New materials or composites	76%	58%	44%
Advanced process control	72%	63%	44%
Robotics and other advanced automation	63%	60%	44%
Additive manufacturing and rapid prototyping	64%	57%	38%
Embedded sensor technology	60%	49%	23%



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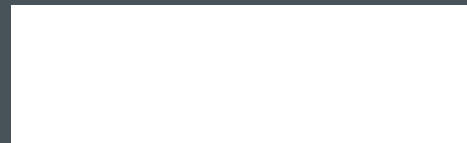
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About the Middle Market

The U.S. middle market comprises nearly 200,000 companies that employ 44.5 million people and generate more than \$10 trillion in combined revenue annually. The middle market is defined by companies with annual revenues between \$10 million and \$1 billion. In addition to their geographic and industry diversity, these companies are both publicly and privately held and include family-owned businesses, sole proprietorships, and private equity-owned companies. While the middle market represents approximately 3% of all U.S. companies, it accounts for a third of U.S. private-sector GDP and jobs. The U.S. middle market is the segment that drives U.S. growth and competitiveness.



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