

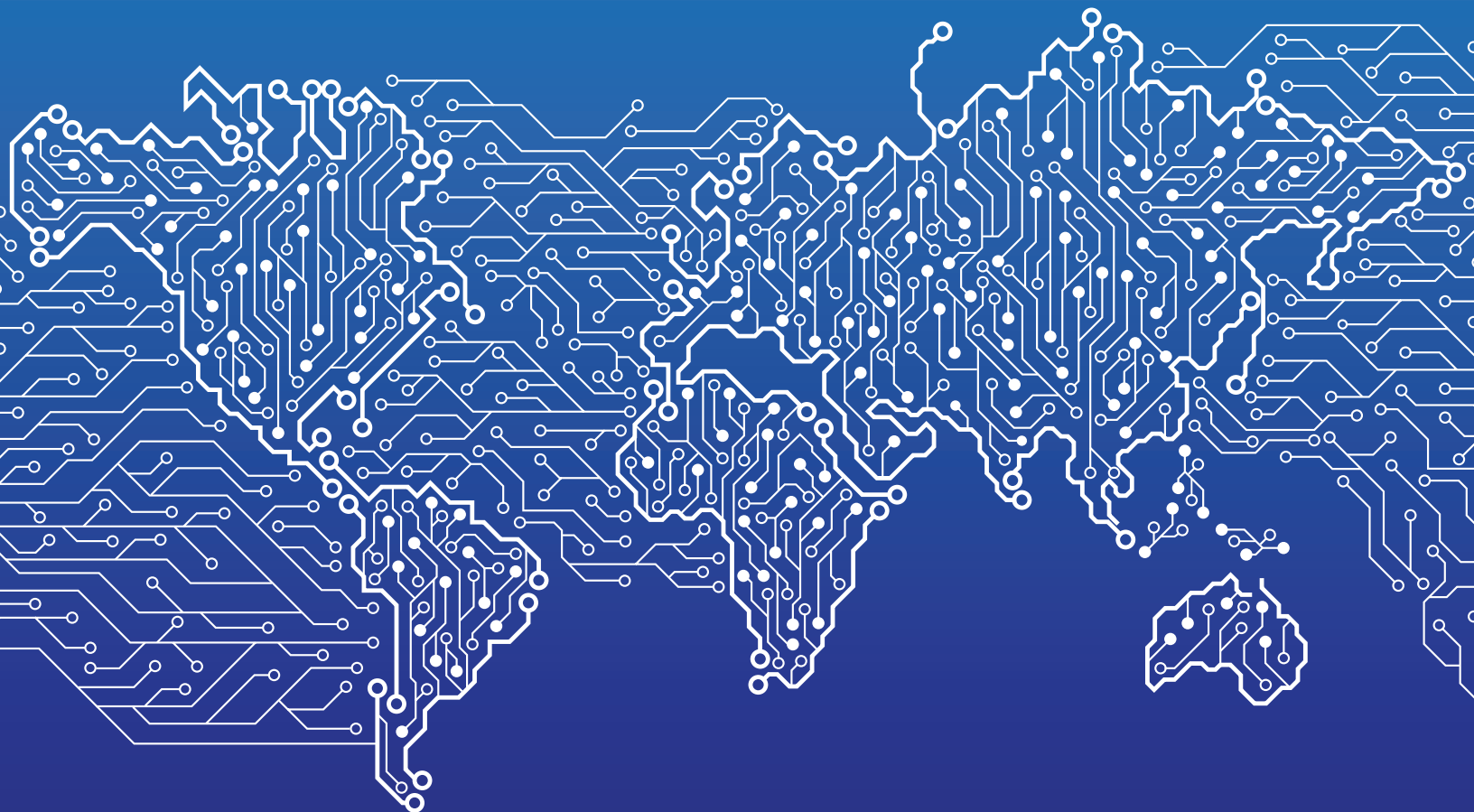
# KPMG Global Semiconductor Survey

## Cautious optimism continues

December 2014



cutting through complexity



**We are pleased to present the results of KPMG's latest Global Semiconductor Survey. The 10th edition of our annual study reflects the expectations of senior leaders from the world's leading semiconductor companies about revenue trends, profitability, geographic growth, product sectors, technology evolution, and other factors influencing the global semiconductor industry over the next three years.**

**O**ur bellwether Semiconductor Industry Business Confidence Index, and responses to survey questions, continue to signal an extended period of cautious optimism among semiconductor executives. Expectations for accelerated growth observed in the 2013 survey have largely been fulfilled, but consistently lower revenue guidance for the fourth quarter of 2014 emerged at the time we were conducting this survey. As a result, the strong year-over-year revenue growth experienced in 2014 was not sufficient to drive a larger increase in the 2014 confidence index, which reflects a positive outlook for favorable trends in most leading indicators—but also a degree of uncertainty.

Industry leaders shared consistent views about the sector's profitability, revenue, and employment growth. Although optimism remains firmly intact and the results are significantly above those experienced in the fourth quarter of 2008 (i.e., in the middle of the last downturn of 2008–2009), the industry has divergent views on its place in the current cycle. While solidly 73 percent of our respondents view the industry in an expansion stage, they were almost evenly split in describing 2015 as indicative of an early expansion stage and later expansion stage.

We hope you find this report's insights useful, and welcome any feedback you would like to offer.



**Gary Matuszak**

Global Chair

KPMG's Technology, Media &  
Telecommunications Practice



**Packy Kelly**

Global Sector Leader

KPMG's Semiconductor  
Practice





## Executive Summary

In this year's results, KPMG's Semiconductor Confidence Index increased to the highest level since 2009, reflecting a positive outlook propelled by the latest industry expansion. The majority (81 percent) are predicting their company's revenue will grow in 2015, with 20 percent calling for double digit revenue growth and only 3 percent expecting a downturn.

Similar results were observed for industry profitability for next year as well as an extended three-year horizon, which demonstrates confidence in the industry's ability to maintain profitability throughout the business cycle. Most agreed that 2015 will continue an expansion stage, with almost equal camps describing it as early expansion stage and later expansion stage.

The medical and networking and communications end markets were identified as providing the greatest growth opportunity for the industry in 2015, while sensors, a key component to medical devices, was the leading product segment. From an applications perspective, cloud computing and data analytics topped the list of growth drivers in the immediate term, joined by robotics and automotive sensors over the three-year horizon.

This year's survey also highlighted a geographic shift in the industry's revenue and profitability prospects. Respondents from China and broader Asia are predicting higher growth rates in revenue and profitability, demonstrating confidence in the momentum of the region's foundries and emerging chip suppliers. China also remains a top export market for revenue growth for the next three years.

Asked about the industry-wide expectations about employment growth, executives forecast moderate workforce expansion in 2014. The United States and China remain the top markets for headcount growth, pointing to an increase in the engineering ranks in these countries. India also showed a noticeable increase

in expected headcount growth, as the country plays a larger role in the development of the software and hardware elements of high-performance consumer electronics. Although expansion expectations are stable, there is a significant decline from 2013 in the executives predicting headcount increases greater than 10 percent.

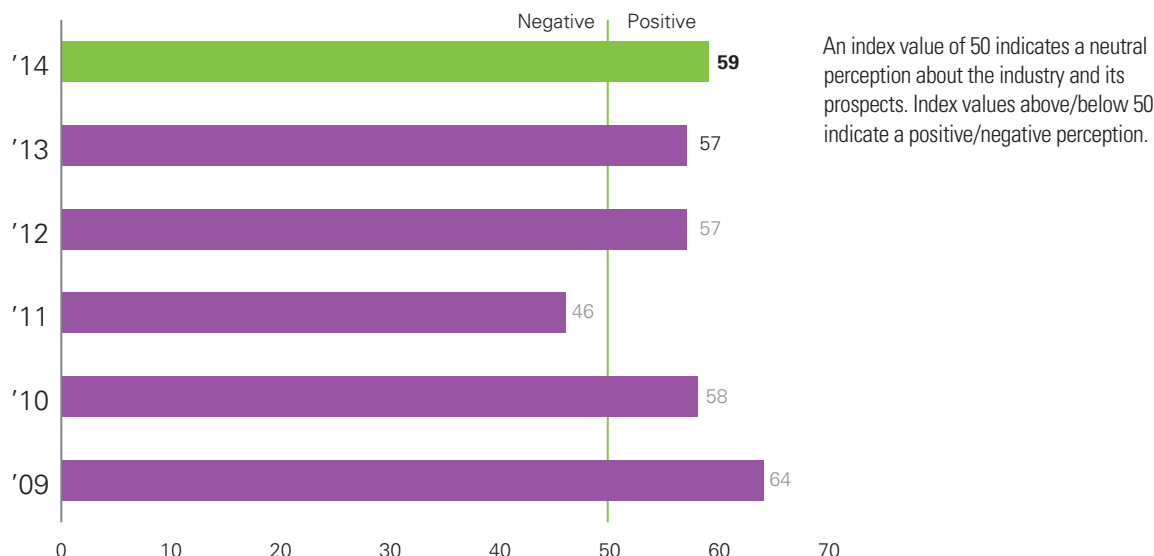
Reflecting higher optimism and a willingness to invest for future growth, executives also forecasted increases in spending on capital equipment and research and development. Consistent with previous surveys, semiconductor executives remain divided whether 450mm production will have a greater impact on the sector than production at sub-20 nanometer technology nodes. Executives believe the industry's transition to 450mm wafers will occur by 2018, but this year's results indicated higher uncertainty about when the shift will occur.

As we approach the 50th anniversary of the founding of Moore's Law, we asked if the industry can continue to reap the benefits of Moore's Law, and only 1 in 4 believe the benefits can continue to be realized for the foreseeable future. Time will tell if this remarkable industry can prove the naysayers wrong again!

*“Competition in the industry has never been more intense as the technology bar required for new product introductions is constantly raised and the time to market for each new design is compressed.”*

— Gary Matuszak, Global Chair  
KPMG's Technology, Media & Telecommunications Practice

## Semiconductor Confidence Index: 2009–2014



Source: 2014 KPMG Global Semiconductor Survey

**In this year's survey, an increase in the Semiconductor Confidence Index** accelerates a positive trend after two years of consistent optimism. The index expresses, in a single figure, responses to a standard set of questions about respondents' outlook on changes in the next fiscal year of the following key metrics:

- **Revenue**
- **Profitability**
- **Global workforce**
- **Research & development (R&D) spending**
- **Capital spending**

An index value above 50 can be interpreted as an optimistic outlook on the business environment for the next 12 months; conversely, an index value below 50 reflects a pessimistic view.

The increase in this year's index reflects higher expectations for industry revenue and profitability and a willingness to make investments in capital spending, R&D, and headcount to support that optimistic outlook.

Since it was introduced in 2006, the index has been a bellwether of the industry's future fortunes and has been a remarkably reliable barometer of future financial and operational trends in the semiconductor industry.

“As the surge in semiconductor demand from smartphones and tablets begins to moderate, new technologies such as the Internet of Things and wearables are emerging as additional revenue sources that can lower the likelihood of past boom and bust cycles.”

— Packy Kelly, Global Sector Leader  
KPMG's Semiconductor Practice



## Survey Highlights



### Revenue growth uptick and downshift

During 2013 and 2014, the semiconductor industry experienced a streak of consecutive quarters of year-over-year revenue growth that most respondents expect to continue in 2015. Overall expectations about revenue growth increased slightly (81 percent this year, compared with 77 percent next year), but there was a shift to lower rates of growth with 34 percent of respondents in 2014 selecting revenue growth in the 1–5 percent range, compared with 28 percent in 2013.



### Profitability is here to stay

The adoption of the fabless and fablite models has enabled the industry to implement virtual manufacturing strategies characterized by a highly variable cost model. Consequently, companies are better equipped to maintain profitability through up and down cycles, which is reflected in the outlook for industry profitability. This year's results show 95 percent of industry executives expect the industry's profitability to stay flat or increase over the next year. Over 90 percent expect the industry's profitability to stay flat or increase when the horizon is increased to the next three years, a long period in an industry notoriously difficult to forecast. From these responses, it appears the sector's extreme boom and bust cycles are in the past.



### New categories of applications

Reflecting increased adoption of semiconductor content in a broader array of application markets, respondents forecast a wider range of revenue drivers for their companies. More powerful sensors, processors, and memory are enabling new exciting applications in cloud computing, data analytics, Internet of Things, and wearable technology in the near term. When asked to look further into the future, executives also identified robotics, automotive sensors, biometrics, and medical imaging as top application opportunities over the next three years.



### Global industry growth

China and the United States remain the most promising growth markets in this year's results, with the survey also highlighting more optimistic attitudes about growth in India, Europe, Japan, and Taiwan. The higher mean scores for Asian markets reflect the importance of the Asia Pacific region as an end market, with more than 50 percent of global sales consistently made to the region. Europe and Japan remain large markets for semiconductor sales, and increases in economic activity in those regions can make meaningful contributions to the overall growth rate. India has been a traditional center for software development and has more recently offered incentives to attract investment in the country by hardware and semiconductor companies.



### Capital spending on the rise

In a positive sign for the semiconductor capital equipment segment, the percentage of respondents calling for a capital spending increase rose (83 percent this year, compared with 79 percent in last year's results) with a notable shift in respondents calling for increases greater than 10 percent. The percentage of respondents forecasting capital spending increases of more than 10 percent almost doubled from the prior year to 22 percent. In 2014, major foundries continued to expand, and the memory sector had another year of strong performance, providing healthy sources of demand for additional capital equipment.



### Chip companies create jobs

Forecasts of headcount growth were slightly less optimistic than the other confidence index metrics. Nevertheless, more executives planned to expand their global workforce in 2015 than in the prior year, with the majority forecasting a modest single-digit rate of growth. The United States and China continue to be seen as the top markets for hiring over the next 12 months, with employment growth also expected in India as software engineering becomes as important as silicon engineering for highly integrated devices.





## R&D spending consistent

Since headcount growth in the semiconductor industry is often centered on research and development, it is no surprise that the outlook for research and development spending is consistent with the outlook for headcount growth. In this year's survey, the number of executives expecting an increase in research and development expenses increased to 83 percent from 78 percent in the prior year. However, more of these executives see growth in the research and development budgets in the 1–5 percent range than at higher levels—a notable contrast from 2013, when more executives were projecting increases of 6–10 percent. Of course, it is not only headcount that drives research and development expenses as the cost of tooling for prototypes at advanced manufacturing processes continues to escalate. In fact, the rising cost of research and development expenses was identified in the survey as the biggest issue facing the industry and is contributing to the ongoing industry consolidation.



## Technology road map

Nearly half of the executives say production of 450mm wafers will have a more significant impact on the industry than production at sub-20 nanometer technology nodes, but confidence in the pace of adoption has declined. In 2012 and 2013, nearly two-thirds of executives expected 450mm commercial production to commence by the end of 2018. In 2014, more executives expect the transition to occur by the end of 2020 and significantly less expect the change to occur by the end of 2018. This perceived delay is consistent with the periodic updates provided by the major sponsors of this technology on the trajectory of adoption. The view that smaller geographies will have less impact on manufacturing cost is consistent with the responses to our new question about the viability of Moore's Law. Only about 26 percent believe the benefits of Moore's Law will continue to be realized for the foreseeable future, with the majority expecting the benefits to cease at some point on the road map past 22 nanometers.

*“ We are pleased to see confidence in the industry consistently on the rise after an extended period of strong year-over-year growth. While the industry always faces myriad challenges—from shifts in the global economy to relentless pricing pressure—we see a number of disruptions in enterprise and consumer markets that are sure to provide many exciting growth opportunities in areas such as cloud, data analytics, autotech and the Internet of Things.*

*As president of the GSA, I have had the pleasure to observe 20 years of amazing execution by this industry and extend my congratulations to KPMG on the publication of their 10th annual global survey! ”*

*— Jodi Shelton, President,  
Global Semiconductor Alliance (GSA)*



## Survey Highlights



### Mobile payments and self-driving cars in focus

Each year, we select emerging technology areas to assess whether industry executives believe there is a real underlying business opportunity or hype. With the recent launch of Apple Pay™, the survey's focus on mobile payment platforms was timely. Mobile payments continue to be viewed as a promising application market, with 56 percent of respondents predicting mobile will offer the predominant method of payment for most transactions within two years. The percent of responses from the United States favoring rapid adoption were meaningfully lower than in other geographies, so it will be interesting to see if nascent platforms can transform the payment habits of Americans. Automotive technologies have provided a mini-boom for semiconductors serving that market in recent years. In this year's findings, we asked when the self-driving car, the ultimate marvel of automotive technology, will become a reality. Almost two-thirds of semiconductor leaders, who usually fear no technical challenge, predicted we will see self-driving cars on driveways and freeways within a decade.



### Mergers and acquisitions an attractive source of inorganic growth

Most semiconductor leaders expect a higher rate of mergers and acquisitions activity over the next year, with 66 percent calling for an increase in the number of transactions. While this is a healthy percentage, it is lower than the prior year (73 percent). With the number of large transactions initiated in 2014, a pause in consolidation in 2015 would not be out of the ordinary. However, the ongoing quest for efficient operating scale, intellectual property assets, and revenue growth is likely to continue to drive mergers and acquisitions as there is never a pause in competition.



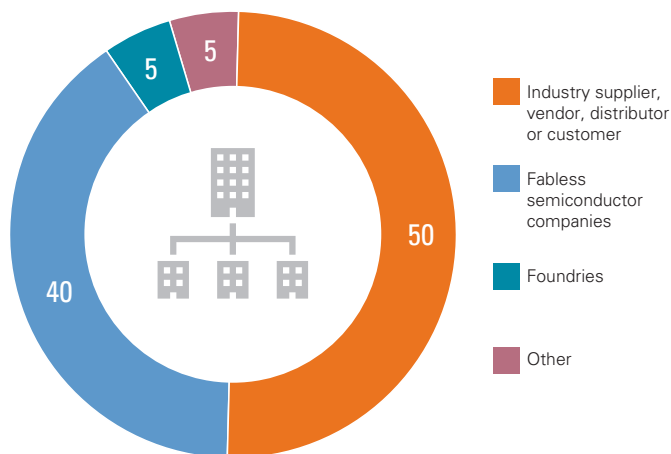




## Demographics

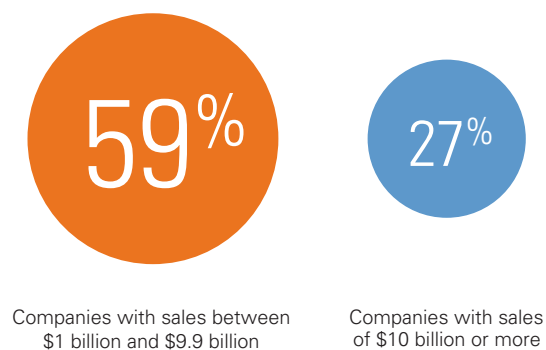
This is KPMG's 10th edition of the Semiconductor Industry Survey. The web based survey was conducted from September to October 2014. Participants included 155 senior executives from leading global semiconductor companies.

### Company type



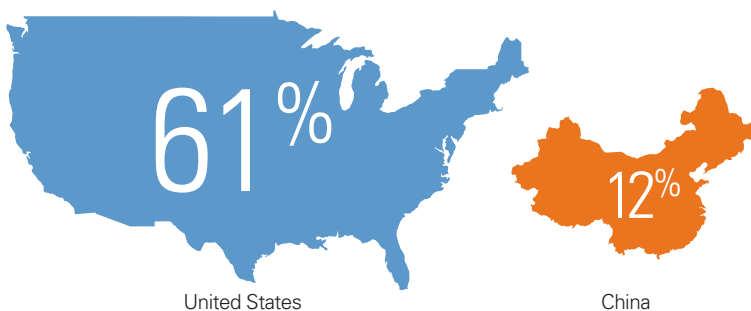
Source: 2014 KPMG Global Semiconductor Survey

### Sales



Source: 2014 KPMG Global Semiconductor Survey

### Geography



Together, the United States and China accounted for approximately 3/4 of the total responses.

Source: 2014 KPMG Global Semiconductor Survey



Detailed Findings

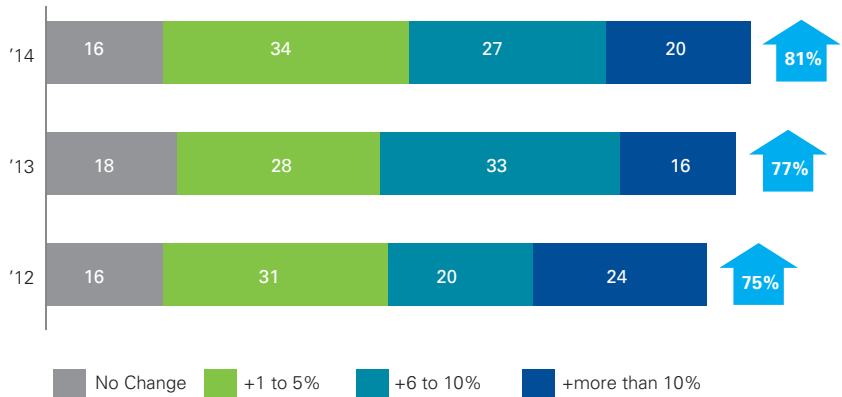
Revenue growth

Most continue to expect their company’s semiconductor revenue growth to increase over the next year, on par with previous years

What is your outlook for your company’s semiconductor revenue growth in the next fiscal year?

Highlighting the industry’s increased optimism, the percentage of senior executives expecting their company’s semiconductor one-year revenue growth to increase over the next year rose to 81 percent, compared with 77 percent last year and 75 percent in 2012.

Opinions about the scope of that growth were mixed, however, with a notable shift in the higher range of revenue expectations. Respondents forecasting growth in excess of 10 percent rose 4 percentage points, with those expecting growth in the 1–5 percent range rising six percentage points.



Source: 2014 KPMG Global Semiconductor Survey

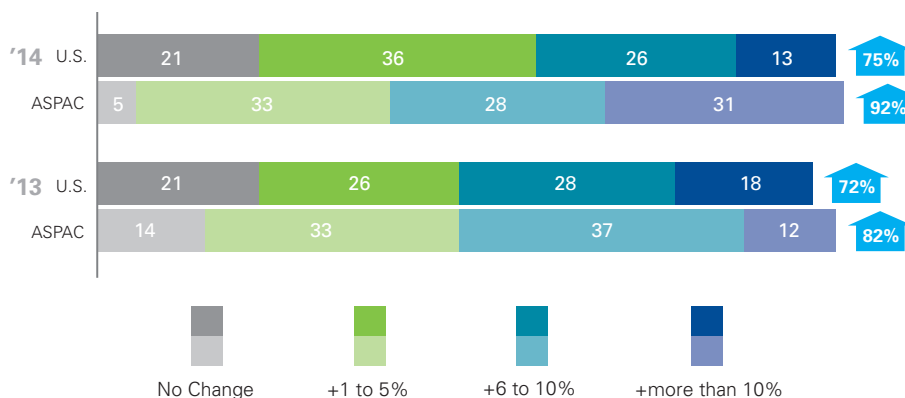


On a geographic basis, optimism was higher in ASPAC than in the United States. Nearly one-third (31 percent) of ASPAC respondents expect revenue growth higher than 10 percent, with similar expectations for lower growth ranges.

In the United States, more than one-third (36 percent) expect revenue growth in the 1–5 percent range, with more than a quarter (26 percent) calling for growth in the 6–10 percent range and 13 percent forecasting growth above 10 percent.

This shift reflects higher growth patterns in ASPAC, especially China, and the emergence of China as a critical end market for products with rich semiconductor content as well as an emerging research center.

### Semiconductor Revenue Growth, Company Outlook: Next Fiscal Year



Source: 2014 KPMG Global Semiconductor Survey

## Revenue growth – Three-year expectations

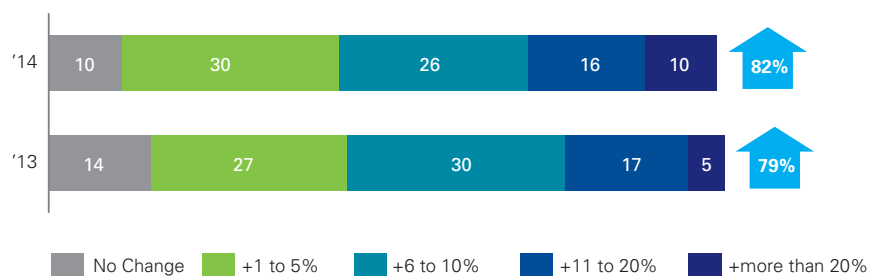
Most also continue to say their company's semiconductor revenue growth will increase over the next three years, up slightly from 2013

### What is your outlook for your company's semiconductor revenue growth three (3) years from today?

Looking at a three-year horizon, the percentage of respondents forecasting increases rose to 82 percent, with most semiconductor leaders expecting growth in the 1–5 percent range. There was a notable increase at the higher end of the growth spectrum, with the percentage of respondents expecting growth in excess of 20 percent doubling to 10 percent.

As with one-year forecasts, growth expectations were higher in ASPAC than the United States. In ASPAC, 39 percent of respondents expect growth in excess of 11 percent, with one-third calling for growth in the 1–5 percent range.

U.S. expectations were slightly more muted, with 27 percent calling for growth in the 1–5 percent range, and nearly one-third citing the 6–10 percent range.



Source: 2014 KPMG Global Semiconductor Survey





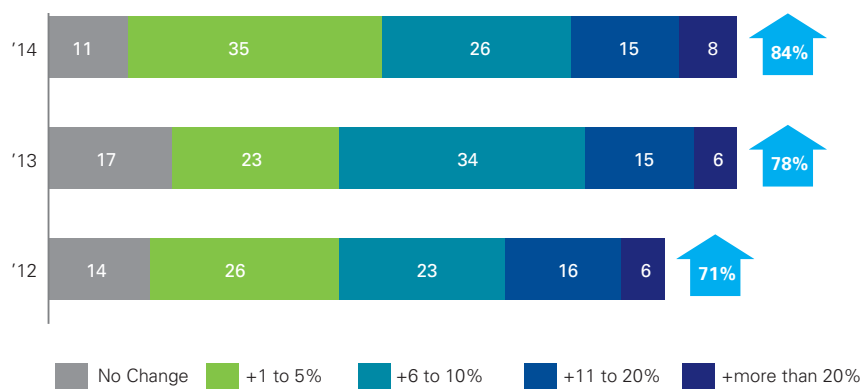
## Detailed Findings

### Profitability

Most continue to say the annual profitability of the global semiconductor industry is expected to increase over the next year, up from 2013

#### What is your estimate for the change in the annual profitability of the global semiconductor industry in the next fiscal year?

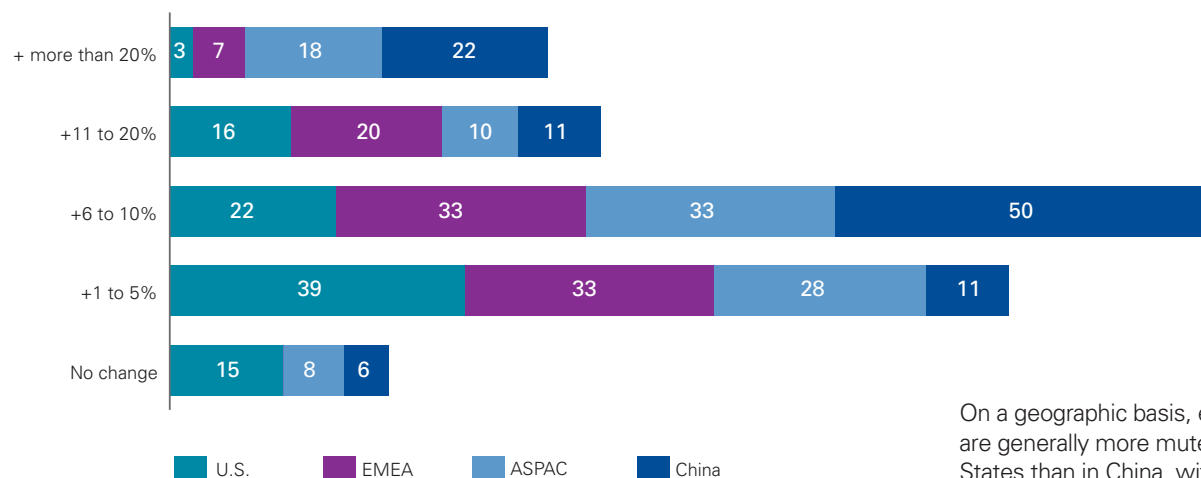
Overall, one-year semiconductor industry profitability forecasts continue to reflect optimistic expectations, with favorable growth in the 1–5 percent range, and a decline in the 6–10 percent range. This divergence of opinion about industry profitability likely reflects how expansive the industry has become. Companies that have the best intellectual property and serve the fastest-growing end markets are best positioned for higher profits. Companies in more mature segments served by many peers are challenged to grow faster than the overall economy and maintain profit margins.



Source: 2014 KPMG Global Semiconductor Survey

#### Estimated change in annual profitability of global semiconductor industry over the next year

#### What is your estimate for the change in the annual profitability of the global semiconductor industry over the next year?



Source: 2014 KPMG Global Semiconductor Survey

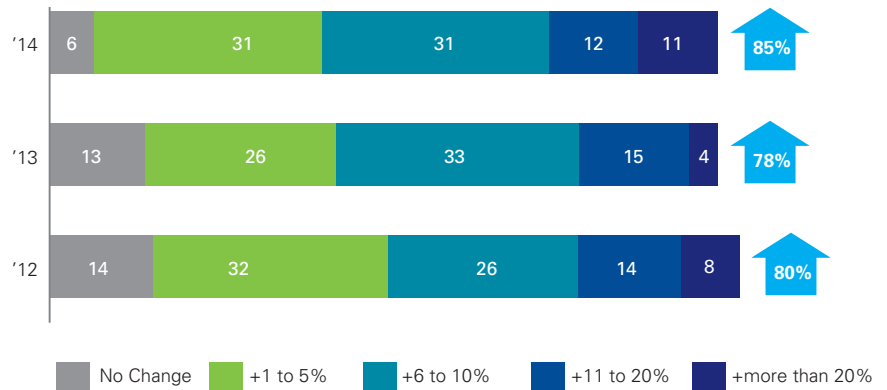
On a geographic basis, expectations are generally more muted in the United States than in China, with U.S. leaders forecasting growth at moderate levels. Expectations in China reflect a trend of local companies taking a larger share of the domestic market.

Similarly, most continue to expect the annual profitability of the industry to increase over the next three years, up from 2013

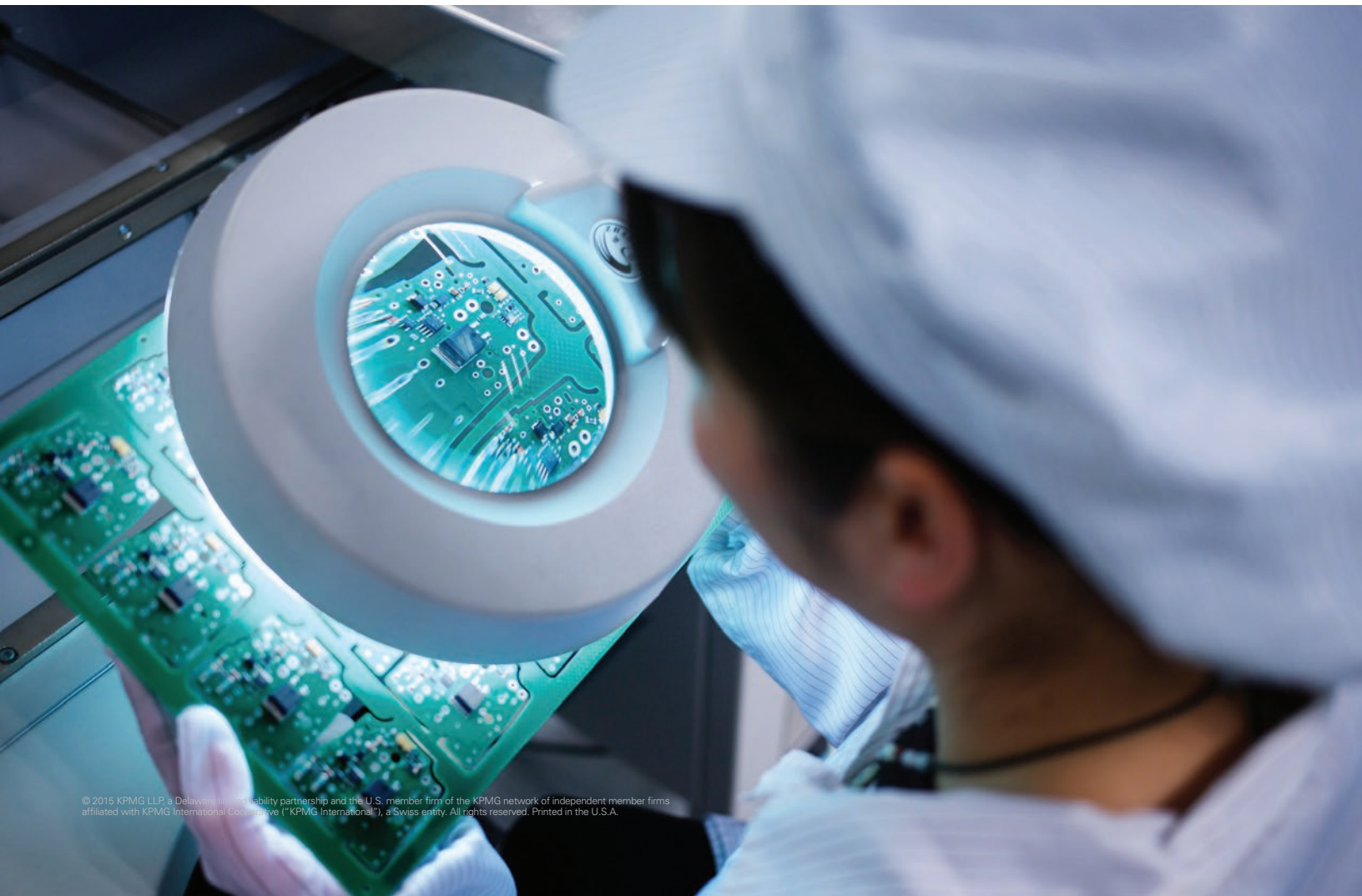
### What is your estimate for the change in the annual profitability of the global semiconductor industry three (3) years from today?

Looking at a three-year profitability horizon, there was a more than doubling of the percentage of respondents who forecast growth of more than 20 percent, and a notable increase in the leaders calling for growth in the 1–5 percent range.

Overall, semiconductor companies see the investments in capital spending, R&D, and headcount resulting in higher profitability in three years and beyond.



Source: 2014 KPMG Global Semiconductor Survey



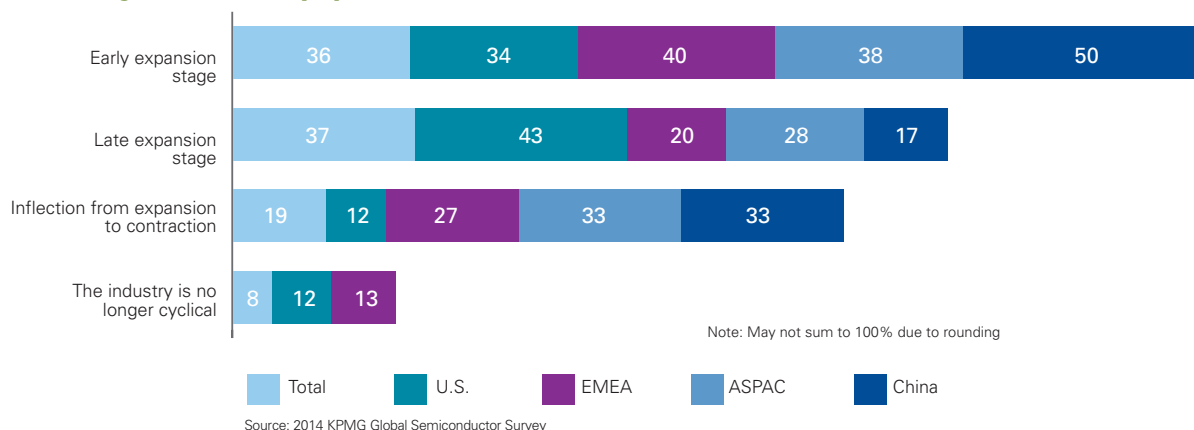


## Detailed Findings

### Industry cycle

Many say the 2015 industry cycle will be best described as being in the expansion stage, equally split between early and late

#### What stage of the industry cycle best describes 2015?



In a new question this year, nearly three-quarters of semiconductor executives agreed the industry remains in an expansion cycle. Beyond that agreement, however, there was divergence of opinion on the expected duration of that expansion, with a nearly even split between those calling the expansion early stage (36 percent) and those citing the latter stages (37 percent) of an expansion cycle.

Reflecting stronger optimism and growth momentum in China (as we saw in other questions), respondents from that country had a brighter view of the industry cycle. Half of the respondents in China said the industry was in the early stage of a growth cycle, while in the United States, 43 percent of the respondents cited a late stage expansion and 34 percent described the expansion as “early stage.”

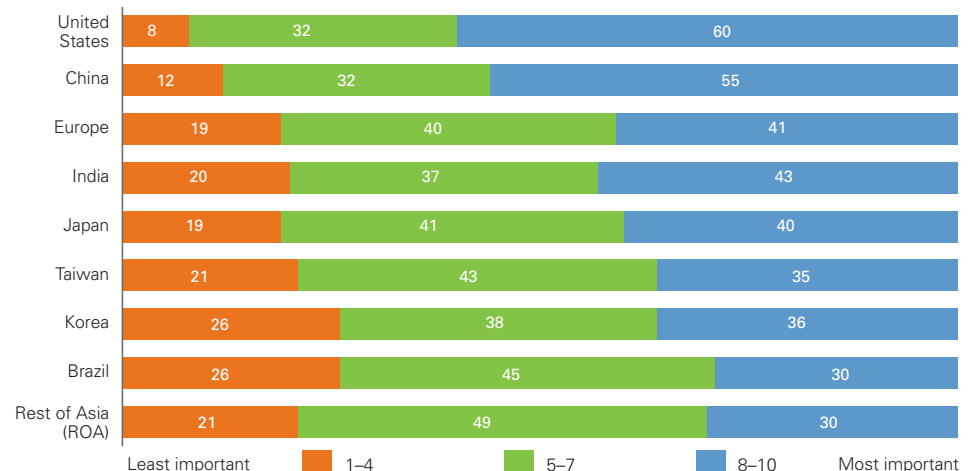




## Geographic growth

Majority say the United States and China will be the most important geographic areas for semiconductor revenue growth in 2015, and three years from today.

**Please rate the importance of the following geographic areas in terms of semiconductor revenue growth for your company in 2015.**



Source: 2014 KPMG Global Semiconductor Survey

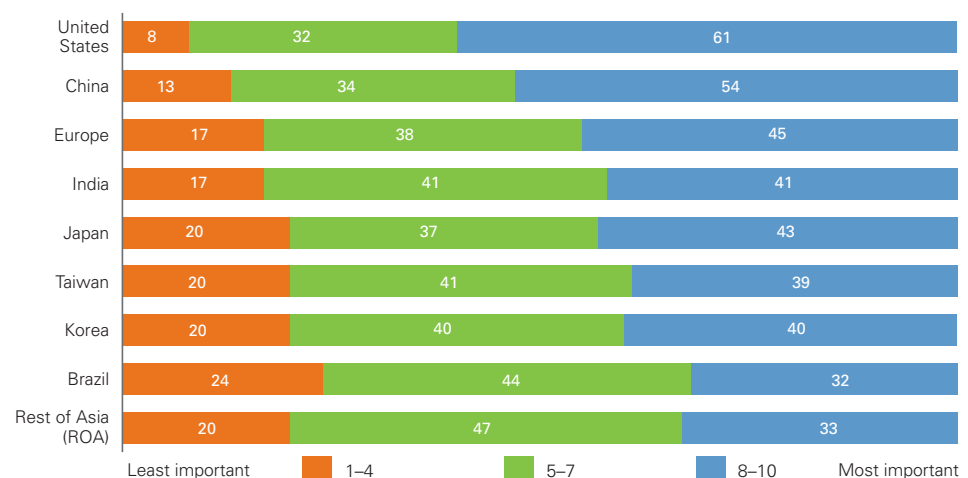
Note: Totals may not sum to 100% due to rounding.

Respondents cited the United States (at 60 percent) and China (55 percent) as the most important geographic areas for semiconductor revenue growth in 2015. As in several other categories, China's prominence in the findings reflects the country's growing importance as an end market, as well as a production and emerging research hub for the semiconductor industry.

And highlighting the global nature of the semiconductor industry, Europe, India, Japan, Korea, and the rest of Asia were also cited as important geographic regions for semiconductor growth.

Perhaps not surprisingly, respondents in China and Asia Pacific overwhelmingly chose China as the most important geographic area for revenue growth in 2015.

**Please rate the importance of the following geographic areas in terms of semiconductor revenue growth for your company three (3) years from today.**



Source: 2014 KPMG Global Semiconductor Survey

Note: Totals may not sum to 100% due to rounding.

Examined on a three-year basis, respondents had similar expectations for the continued importance of the United States and China as key semiconductor revenue growth markets.

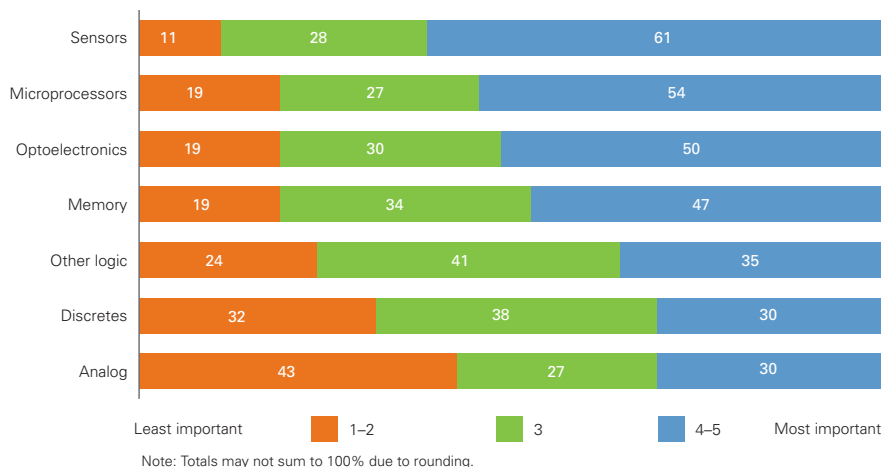


## Detailed Findings

### Product technologies

Sensors are expected to provide the highest growth opportunity in 2015 for the semiconductor industry

#### Which of the following sectors will provide the strongest growth opportunity in 2015 for the semiconductor industry? — Global



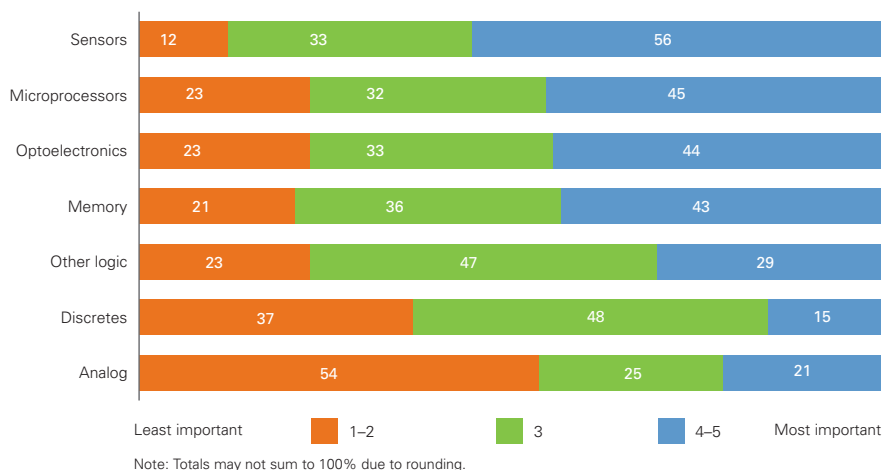
Source: 2014 KPMG Global Semiconductor Survey

Reflecting increased expectations for adoption of the Internet of Things and the growing adoption of wearable devices, respondents cited sensors as the product technology with the highest growth opportunity in 2015.

The strength observed for microprocessors and memory is consistent with the notable strong performance of the computing market observed in 2014.

Sensors were followed closely by microprocessors, optoelectronics, memory, other logic, discretes, and analog.

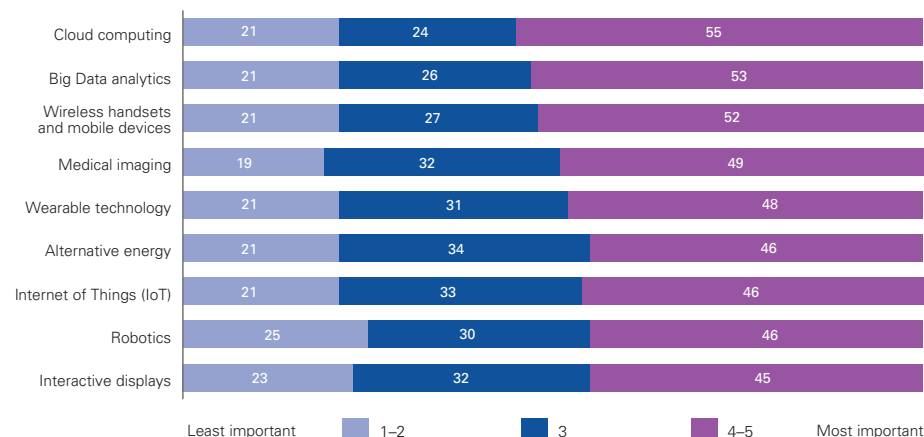
#### Sectors that will provide the strongest growth opportunity in 2015 for the semiconductor industry? — U.S.



Source: 2014 KPMG Global Semiconductor Survey

## Cloud computing, Big Data, and wireless/mobile application markets seen as most important semiconductor revenue drivers over the next year

### How important are each of the following application markets in driving your company's semiconductor revenue stream over the next fiscal year?



Note: Totals may not sum to 100% due to rounding.

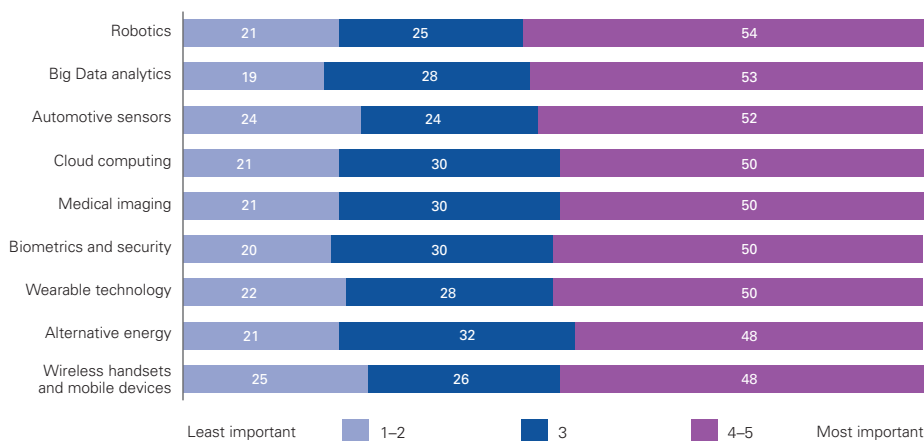
Source: 2014 KPMG Global Semiconductor Survey

Cloud and mobile are expected to remain important revenue drivers, but respondents also forecasted a shift toward technologies enabled by the cloud and mobile platforms. These include Big Data, Wearable technology, and Internet of Things.

On a geographic basis, the importance of cloud was cited as higher in ASPAC and EMEA than the United States, reflecting the advanced maturity of cloud adoption in those regions.

## Several application markets seen as important semiconductor revenue drivers over the next three years

### How important are each of the following application markets, to the growth of your company's semiconductor revenue, three (3) years from today?



Note: Totals may not sum to 100% due to rounding.

Source: 2014 KPMG Global Semiconductor Survey

A notable change over prior years' surveys is the continuing decline of both consumer and wireless/handsets as drivers of industry growth. With a broader adoption of cloud and mobile around the world, which also enables the advancement of data and analytics, several new markets are emerging as the growth drivers of the industry. Over the next three years, these are expected to include robotics, Big Data analytics, automotive sensors, medical imaging and others.





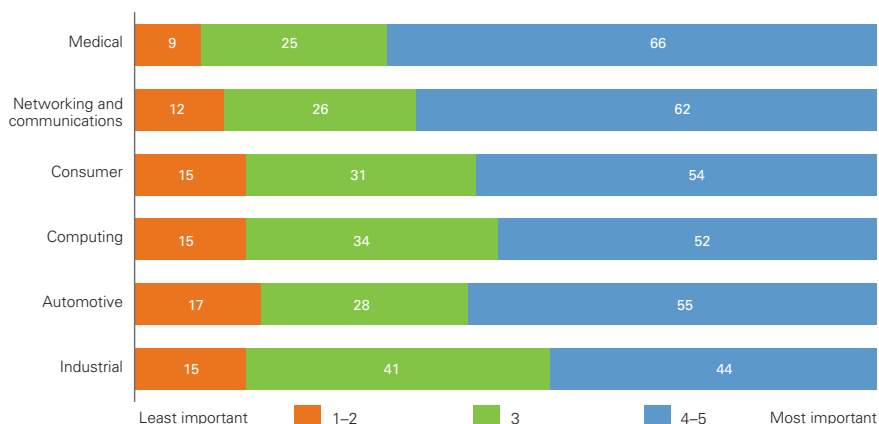
## Detailed Findings

### End markets

#### Medical and networking and communications end markets expected to provide strongest growth opportunity in 2015

##### Which of the following end markets will provide the strongest growth opportunity in 2015?

Although networking and communications were again cited as promising end markets for the industry in 2015, medical was cited as the most promising source of industry growth. Other established end markets, including consumer and computing, were again cited as important because of the large size of these markets, even as they exhibit maturity and lower growth.



Note: Totals may not sum to 100% due to rounding.

Source: 2014 KPMG Global Semiconductor Survey

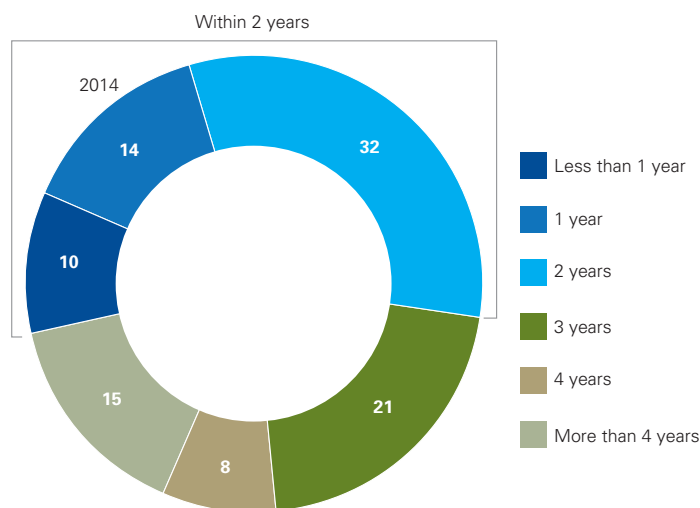
### Mobile payments

#### Majority say mobile payments will become the predominant method of payment within two years

In the past two surveys we asked about the timeframe for adoption of mobile payments as a closely watched market disruption impacting the industry. There does not yet appear to be a clear consensus on how quickly the digital wallet will become the predominant method of payment globally.

This variation of opinion likely reflects a growing recognition that mobile payment adoption is not merely a technology issue. Successful consumer adoption will require integration with merchants and banks, and will likely produce competition among different technologies and frameworks for market share.

Respondents remain unsure about the timeframe for these and other adoption hurdles to be addressed in the payments marketplace.



Source: 2014 KPMG Global Semiconductor Survey

## Capital spending

Most continue to say their company's semiconductor-related capital spending will increase for the next fiscal year

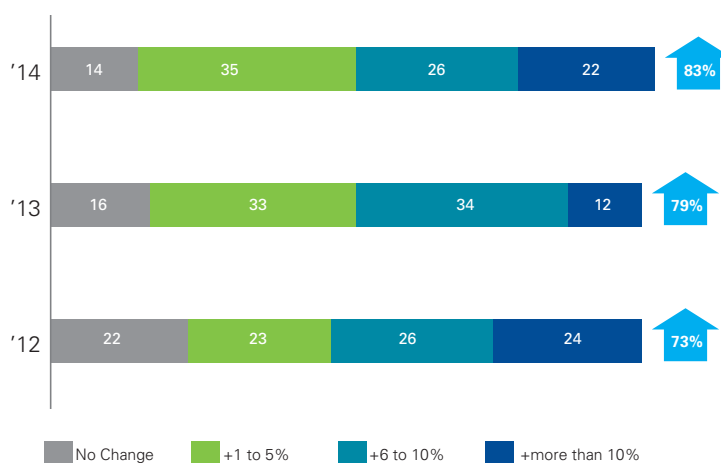
### What is your outlook for semiconductor-related capital spending by your company (both equipment and software) for the next fiscal year compared with your company's current year spending?

The projected increases in capital spending are consistent with the other survey findings that the industry is in an expansion stage and excess capacity is not currently a concern.

On a one-year horizon, there is a notable increase in the number of companies planning to increase capital spending in excess of 20 percent, as well as stable investment plans at more moderate levels.

Viewing results on a geographic basis, higher investment is planned by respondents in China and ASPAC, with nearly 40 percent of executives (39 percent in China and 36 percent in ASPAC) citing investment increases in the 6–10 percent range. In contrast, U.S. respondents called for more modest plans, with 35 percent citing increases in the 1–5 percent range.

Looking at a three-year horizon, respondents cited similar plans, with growth in investment at higher ranges than 11 percent. Respondents in the United States and China shared similar expectations, with division between the 6–10 percent and 1–5 percent ranges.



Source: 2014 KPMG Global Semiconductor Survey





## Detailed Findings

### R&D spending

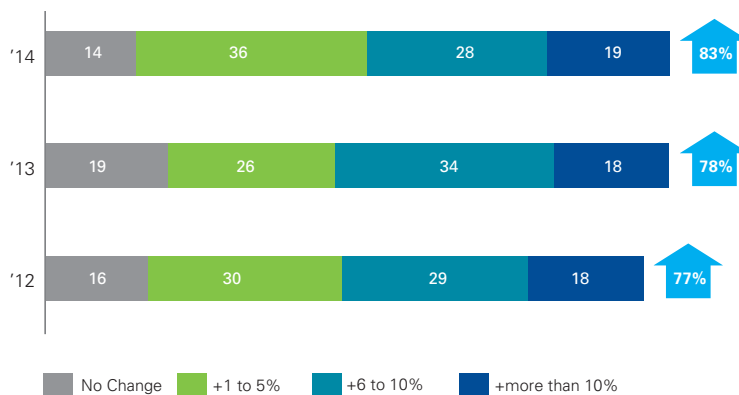
Similar to 2013, many expect semiconductor-related R&D spending to increase in the next fiscal year

#### What is your expectation for the change in semiconductor R&D spending by your company for the next fiscal year over the current year?

Recognizing the critical importance of R&D spending to future revenue and profitability growth, the percentage of respondents calling for R&D investments to increase by more than 10 percent remained consistent in this year's findings. The results also indicate a degree of uncertainty among the semiconductor leaders, with significant growth in the 1–5 percent growth range, but moderation in the 6–10 percent range.

The increase in R&D costs continues to be a concern for survey respondents. Research and development budgets are strained by the increasing mask costs at advanced nodes, as well as the software required for higher integration that customers demand—but largely are not willing to pay for separately.

On a geographic basis, respondents in China and ASPAC again generally showed more optimism than their counterparts in the United States. Nearly 40 percent of respondents in China, for example, expect growth in the 6–10 percent range, with more than one-third calling for R&D spending increases above 10 percent. In the United States, R&D expectations skewed lower, with 39 percent in the 1–5 percent range, and 27 percent in the 6–10 percent range.



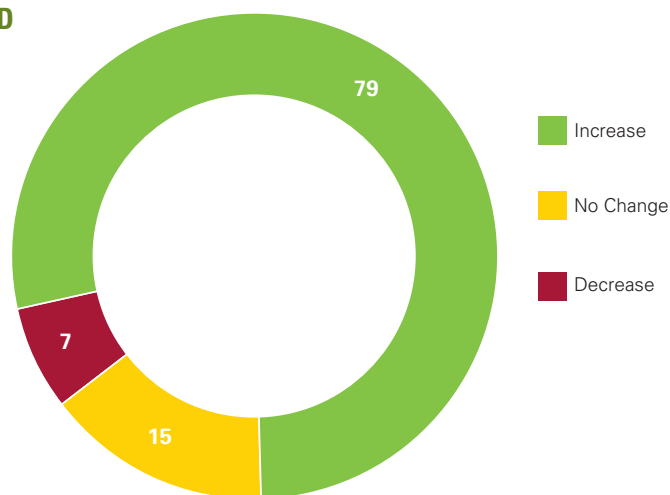
Source: 2014 KPMG Global Semiconductor Survey

### Many expect their company's semiconductor R&D spending to increase three years from today

#### What is your expectation for the change in semiconductor R&D spending, by your company, three (3) years from today?

On a three-year basis, executives expect some increases in R&D spending, but those investments are generally expected to remain consistent or to increase moderately.

There is no doubt that research and development effort is the lifeblood of the industry and leaders recognize increased research and development spending is necessary to sustain revenue growth.



Note: May not sum to 100% due to rounding.

Source: 2014 KPMG Global Semiconductor Survey

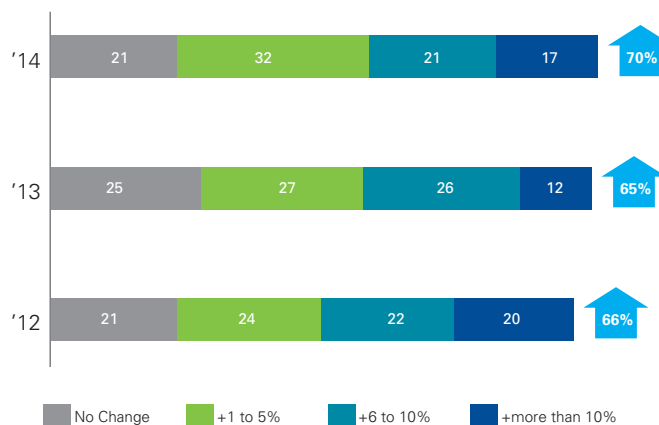
## Workforce expansion

Many continue to expect their company's global semiconductor workforce to expand during the next fiscal year

### During the next fiscal year do you expect your company's global semiconductor workforce to expand or contract?

In a positive sign for industry confidence, survey respondents expect to increase employment in the near future. Since more companies outsource manufacturing, an increase in headcount usually equates to hiring more engineers, which are in high demand in the United States and China.

The percentage of respondents calling for increases rose five percentage points in this year's results, with growth coming primarily in the 1–5 percent range. Respondents expecting growth in excess of 10 percent also increased to 17 percent, compared with 12 percent in last year's findings.

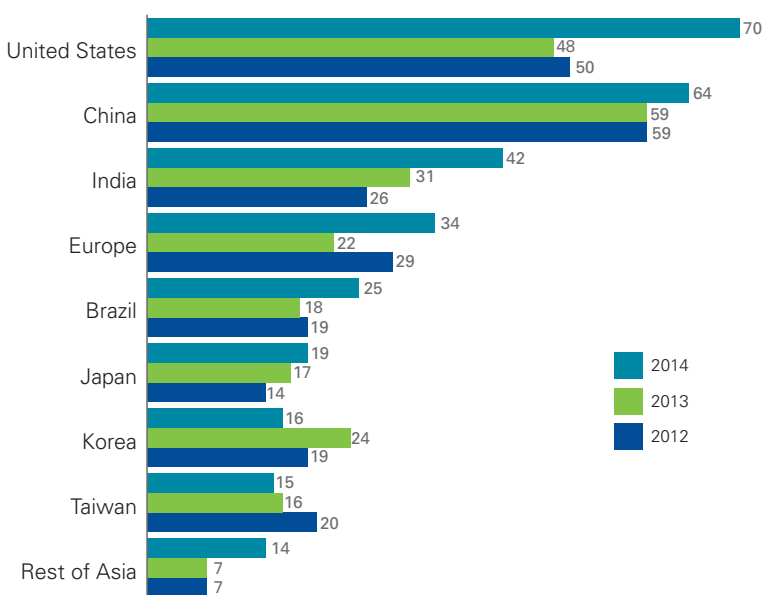


Source: 2014 KPMG Global Semiconductor Survey

The United States and China continue to be seen as the top markets for headcount growth over the next 12 months, higher optimism for most markets

### Please indicate the top three markets for headcount growth in the semiconductor industry during the next 12 months.

Asked about the top markets for headcount growth over the next year, semiconductor executives again cited the United States and China, with growth also expected in India and Europe.



Note: Respondents provided more than one answer.

Source: 2014 KPMG Global Semiconductor Survey





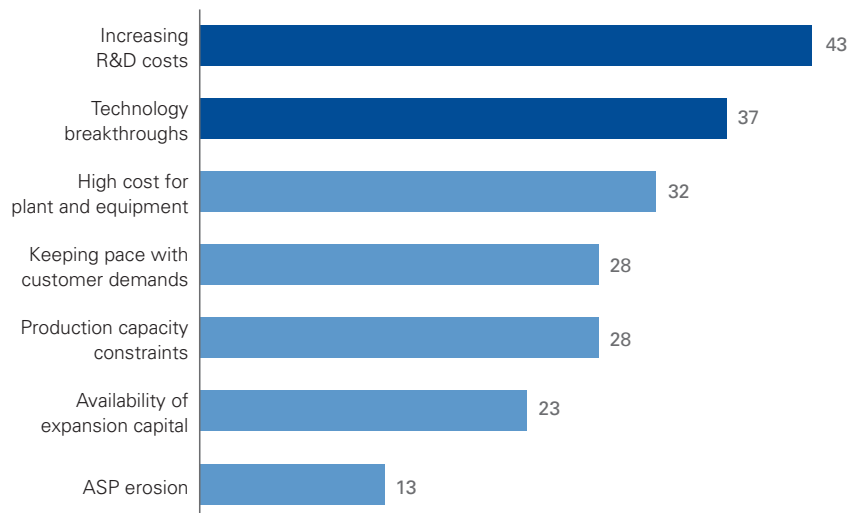
## Detailed Findings

### Obstacles and challenges

Increasing R&D costs and technology breakthroughs cited most often as biggest issues facing semiconductor industry during the next three years

#### What do you see as the biggest issues facing the semiconductor industry during the next three years? — Global

The semiconductor industry has long been known for being capital-intensive and complex, and those characteristics were cited as among the leading challenges companies expect to face over the next three years. Increasing R&D costs were cited by more than 40 percent of the respondents, followed closely by the ability to maintain technology breakthroughs. Nearly one-third cited the high cost of semiconductor fabs and equipment as obstacles to industry growth. Prices of semiconductor products regularly degrade rapidly after initial introduction.



Note: Respondents provided multiple answers.

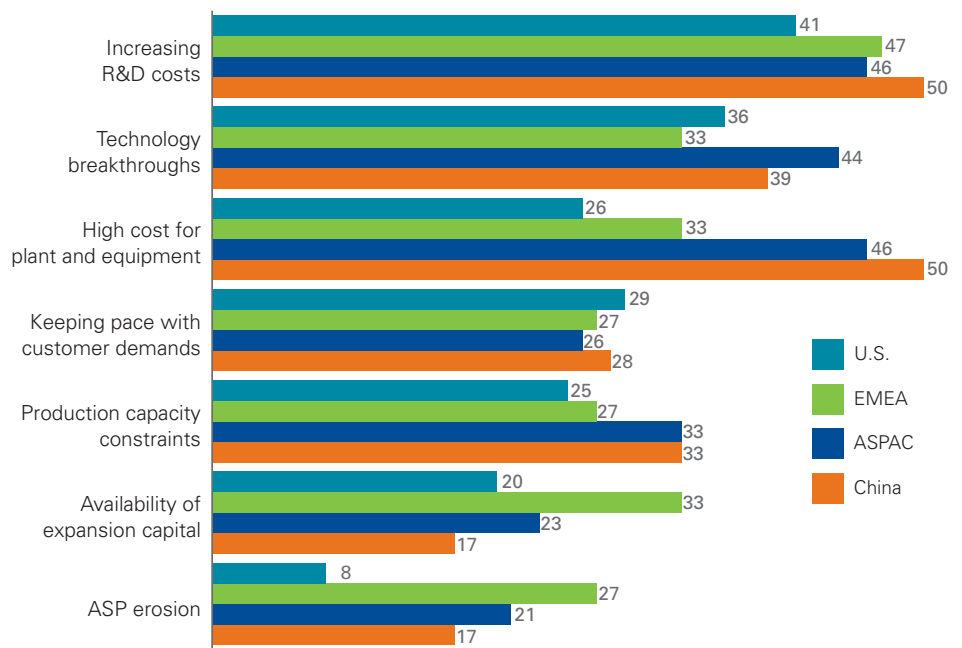
Source: 2014 KPMG Global Semiconductor Survey

#### What do you see as the biggest issues facing the semiconductor industry during the next three years? — by region

As these issues are embedded in industry structure, it is not a surprise that executives do not expect much relief from these challenges, citing them again when asked about industry issues over a three-year time horizon.

“The combination of price degradation with the escalation in development labor and material costs constantly threaten the profitability objectives of semiconductor companies.”

— Packy Kelly,  
Global Sector Leader,  
KPMG's Semiconductor Practice



Source: 2014 KPMG Global Semiconductor Survey

## Technology road map

As in 2013, majority say the transition to the 450mm wafer will occur between 2015 and 2018; more likely in 2017–2018

### When do you think the transition to the 450mm wafer will occur?

This year's findings about the adoption of 450mm wafers indicate a decrease in expectations for a short-term transition, with the majority of respondents forecasting the 2017–2018 time frame. This year's results also indicate growing uncertainty about whether a 450mm wafer transition will take place, with notable growth in categories such as "will never happen" or "don't know."

Despite significant capital investment that few suppliers can fund, the shift to 450mm is expected to occur because chip companies must not only produce amazing devices, but do so at an efficient price.

On a geographic basis, semiconductor leaders in China and Asia Pacific tended to be more optimistic than their counterparts in the United States and Europe.

Transition to the 450mm wafer	2014	2013	2012
2015–2016	15%	18%	43%
2017–2018	39%	45%	22%
2019–2020	19%	17%	7%
2021–2022	4%	7%	
After 2022	1%		
The transition will never happen	4%	0%	1%
Don't know/not sure	18%	13%	15%

Transition to the 450mm wafer	U.S.	EMEA	ASPAC	China
2015–2016	9%	7%	26%	22%
2017–2018	37%	20%	54%	56%
2019–2020	20%	47%	10%	11%
2021–2022	3%	7%	5%	6%
After 2022	0%	0%	0%	0%
The transition will never happen	6%	0%	0%	0%
Don't know/not sure	24%	20%	5%	6%

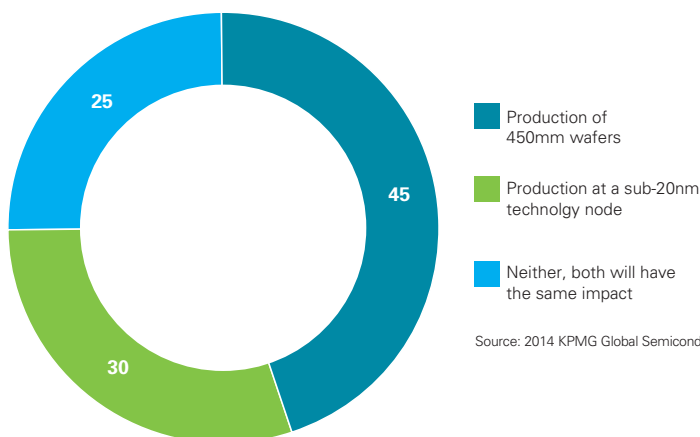
Totals may not sum to 100% due to rounding.

Source: 2014 KPMG Global Semiconductor Survey

Over 4 in 10 continue to say 450mm wafer production will have a greater impact on the industry than production at a sub-20nm technology node

### Thinking about the future of production technology, which will have a greater impact on the semiconductor industry, production at a sub-20nm technology node or the production of 450mm wafers?

Consistent with previous year's results, nearly half of the executives (45 percent) say production of 450mm wafers will have a more significant impact on the industry than production at a sub-20 nanometer technology node.



Source: 2014 KPMG Global Semiconductor Survey



## Detailed Findings

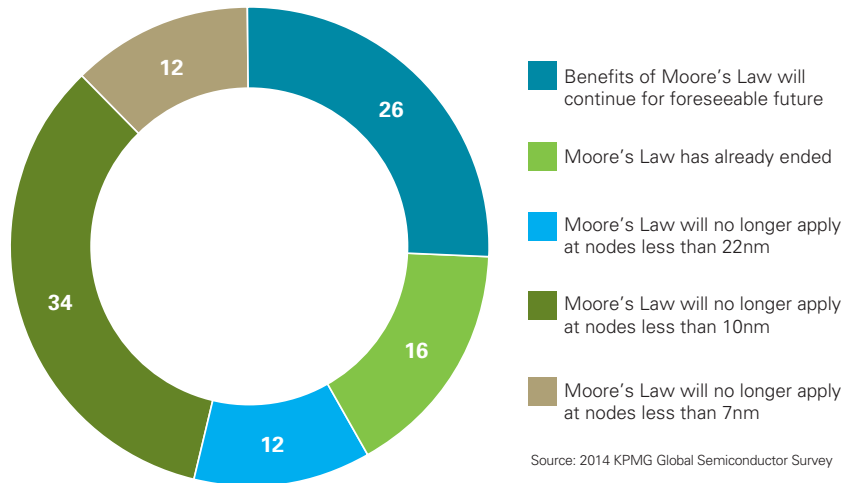
### Outlook mixed for Moore's Law\*

#### Responses somewhat mixed regarding Moore's Law

##### Which of the following best describes your perspective on the outlook for Moore's Law? — Global

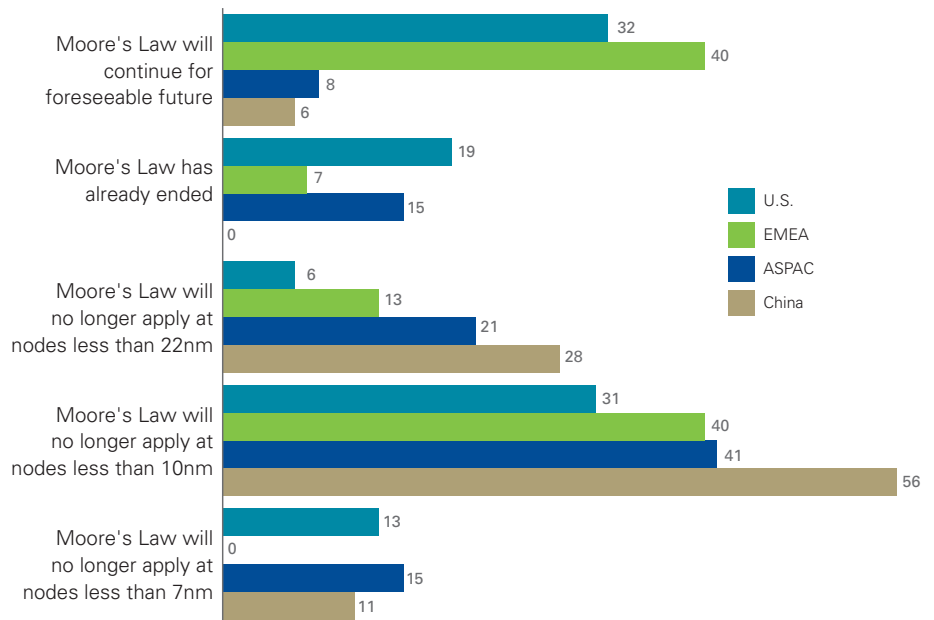
After a half-century of fulfilled promise, the industry is wondering whether Moore's Law can continue based on the known technological road maps. Semiconductor executives were divided about the future applicability of Moore's Law, with the majority saying it will end after 10-nanometer nodes are commercialized, but 26 percent believe the benefits will continue to be realized for the foreseeable future. Another 16 percent of respondents say Moore's Law has already ended.

\* Moore's Law, named after Intel cofounder, Gordon Moore, states that the number of transistors that can be placed on an integrated circuit doubles approximately every two years.



##### Which of the following best describes your perspective on the outlook for Moore's Law? — Regional

On a geographic basis, respondents from China tended to be less optimistic about the continuation of Moore's Law than those in the United States or Europe.



Note: Totals may not sum to 100% due to rounding.

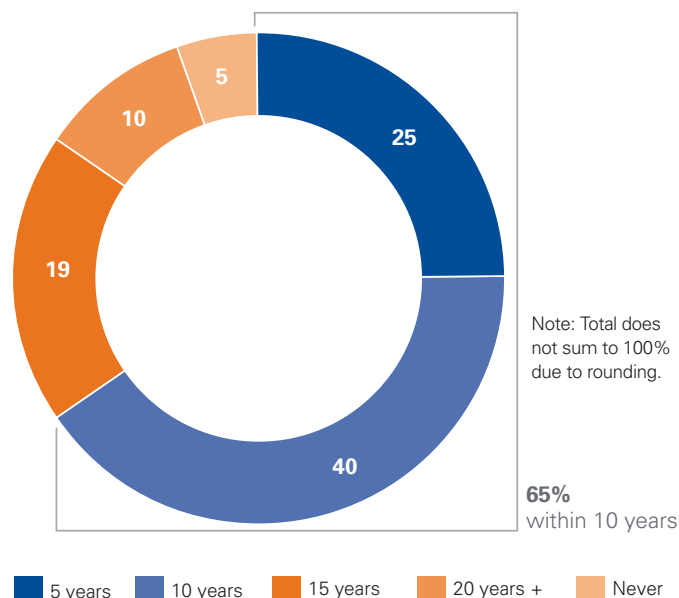
Source: 2014 KPMG Global Semiconductor Survey

## Self-driving cars

### Significant majority say self-driving cars will become a reality within 10 years

**Given the large role of semiconductors in the technology of self-driving cars, within how many years do you think self-driving cars will become a reality?**

Asked about the adoption of self-driving cars, the majority of respondents expect to have to continue driving themselves for the foreseeable future. Although a quarter expect to see self-driving cars within five years, the majority (40 percent) forecast a 10 year time frame, and 19 percent are looking at a 15-year period.



Source: 2014 KPMG Global Semiconductor Survey

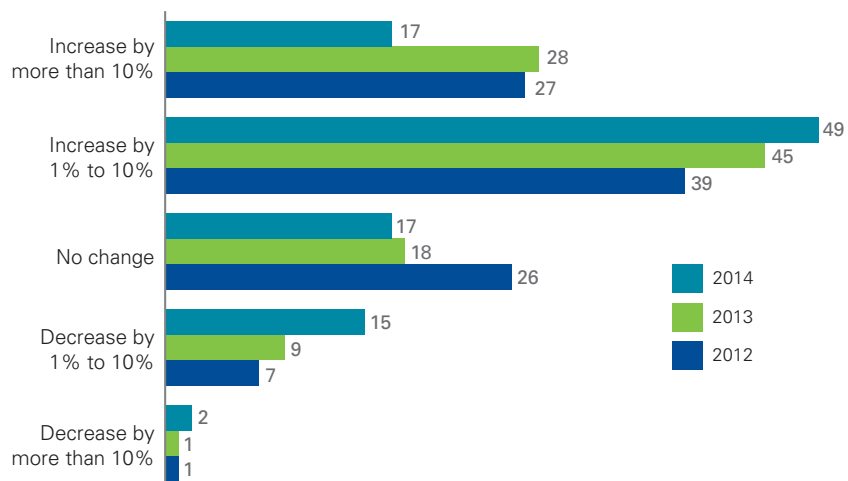
## Mergers and acquisitions

### Executives continue to say the expected rate of change in global M&A deals will increase; those who say it will decrease has doubled

**What is your prediction for the expected rate of change in the number of global M&A deals in the next fiscal year (2014/2013/2012), based on the previous three-year average?**

Despite some notable transactions in 2014, semiconductor executives have largely consistent expectations for the volume of global M&A transactions, with 1–10 percent growth being cited most frequently. Companies expect to maintain growth in revenue and profitability, but in relation to 2013 more plan to invest in organic growth (through capital spending and research) than pursuing growth through mergers or acquisitions.

On a geographic basis, U.S. respondents tended to cite lower levels or no change, with higher expectations of M&A being forecast in China.



Source: 2014 KPMG Global Semiconductor Survey





## Conclusion

**KPMG's Semiconductor Confidence Index increased in this year's survey, reflecting moderate expectations for higher profitability and revenue growth — both industry-wide and at their specific organizations — among leaders of global semiconductor companies.**

With a wider range of attractive product categories and broader geographic markets, the majority of respondents agree the semiconductor industry remains in an expansion stage and may be becoming less susceptible to the boom-and-bust cycles of the industry's earlier years.

Among the reason for their increased optimism is growth among products such as sensors, which is expected to provide the highest growth opportunity for the industry in 2015.

End markets expected to provide the strongest growth opportunity in 2015 for the semiconductor industry include medical, networking and communications, and a resurgent market for computing products.

Looking at short-term application markets, respondents cited cloud and Big Data as the most attractive. Looking further out, they expect automotive sensors, robotics, and biometrics and security to be key revenue drivers.

Reflecting the increasingly global nature of semiconductor markets, respondents cited the U.S. and China as the most important geographies for revenue growth, with attractive opportunities also expected in India and a recovering Europe.

These optimistic developments are reflected in respondents' willingness to invest for future growth, with executives saying their companies plan to increase semiconductor-related capital and R&D spending, and to expand their global semiconductor workforces.

The rate of global M&A deals is also expected to increase, providing another source of investment and future growth.

From a technology perspective respondents say the transition to 450mm wafers is expected to shift out to later this decade, and after 50 years, the miracle of Moore's Law — an industry bedrock — is being called into question as nodes shrink below the 10-nanometer level.

Which is not to say there won't be challenges. Among the industry issues leaders cited were increasing R&D costs and pressure to develop technology breakthroughs continually.

In response, many semiconductor companies are adjusting business models and increasing their ability to adjust to emerging changes in end markets with enhanced fiscal discipline and other operational changes.

Despite the challenges, the likely winners over the next one to three years are those semiconductor companies best able to take advantage of the opportunities in emerging application markets — while managing the pressure of maintaining excellence in their technological innovation, supply chain and other critical success factors.

## About the authors

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**Gary Matuszak** is the global chair of KPMG's TMT industries and chair of KPMG's Global Technology Innovation Center. Gary has held a number of technology sector leadership positions during most of his career and has extensive experience working with global technology companies ranging from the FORTUNE 500 to pre-IPO startups. He represents KPMG in a number of organizations affecting the industry and has influenced the development of key positions on several issues that impact the technology sector. Gary is a frequent spokesperson for the firm on technology industry trends, including emerging technologies, cloud and mobile business strategies, and C-suite industry outlooks. Before joining KPMG in 2002, he was the Silicon Valley office managing partner for Andersen, where he led the U.S. Software practice.

**Packy Kelly** is the global and U.S. leader of KPMG's semiconductor practice and is a member of the global industry leadership team. Packy has over 23 years of experience providing auditing and accounting services. Packy's professional experience includes serving major semiconductor companies in SEC reporting, mergers and acquisitions, and debt and equity capital raises. Packy has participated in the firm's sponsored executive roundtables with the Global Semiconductor Alliance and executive briefings with the Semiconductor Industry Association.

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