



strategy&

The 2015 Global Innovation 1000

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Automotive industry findings



pwc

In the 2015 Global Innovation 1000 study, Strategy&, PwC's strategy consulting business, analyzed the flows of R&D spending among companies and countries worldwide.

We found that the geographic footprint of innovation has expanded dramatically in the years since our 2008 study, when we first charted the globalization of R&D. The new landscape reflects significant regional shifts, as more companies pursue global innovation programs in search of access to top talent and high-growth markets.

In this report, we take a closer look at how these changes are happening in the automotive industry.

About the Global Innovation 1000: For the 11th year Strategy&, PwC's strategy consulting business, analyzed R&D investment at the 1,000 biggest-spending public companies in the world. In addition to undertaking our recurring analysis of R&D spending trends, we examined the R&D footprint of some of the world's top companies to understand how much they are spending on R&D, where and how that spend has shifted since our last study on this topic in 2008. We researched the innovation activities of 207 companies in 23 countries conducting R&D at 2,041 R&D sites in more than 60 countries. This sample of major innovators accounts for 71 percent of the total Global Innovation 1000 R&D spending. All references to R&D flows are the results of this analysis. We also interviewed and surveyed more than 300 R&D executives and innovation leaders to get their perspectives on their companies' own R&D spending.

Automotive industry R&D spending grew by 4.5% from 2014 to 2015

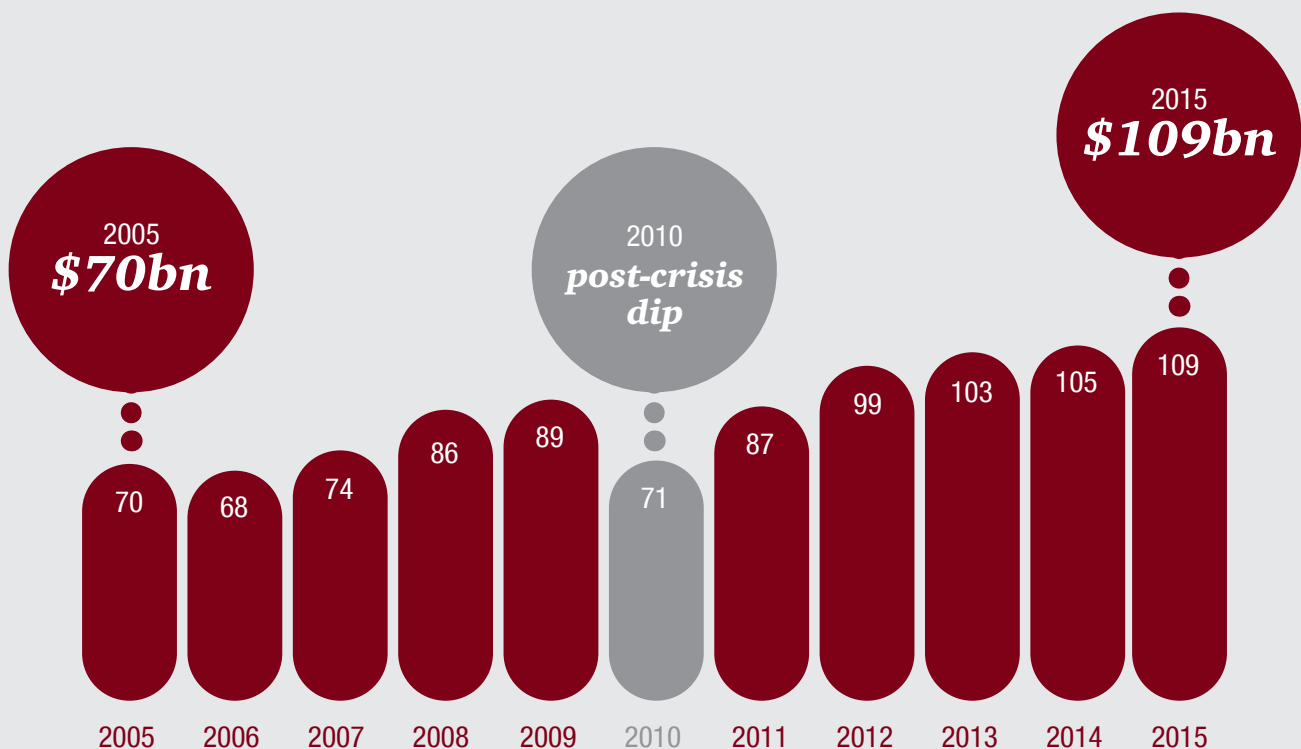
In 2015, there were 92 auto companies in the Global Innovation 1000 (down one from 2014). Collectively, they represented 16.1% of the total Global Innovation 1000 R&D spend after increasing spending by 4.5% from 2014, the fifth highest of all industries.

Japan had the largest number of companies among the auto industry group in the Global Innovation 1000, followed by North America and Europe.

China's automotive industry has grown significantly since we started our survey research. The number of Chinese automotive companies in the Innovation 1000 has increased by 1,300% since 2005.

In 2015, SAIC also made it onto the list of the Top 20 automotive R&D Spenders for the first time.

 **Exhibit 1**
Automotive industry R&D spending continued to rise in 2015



Sources: Strategy&2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

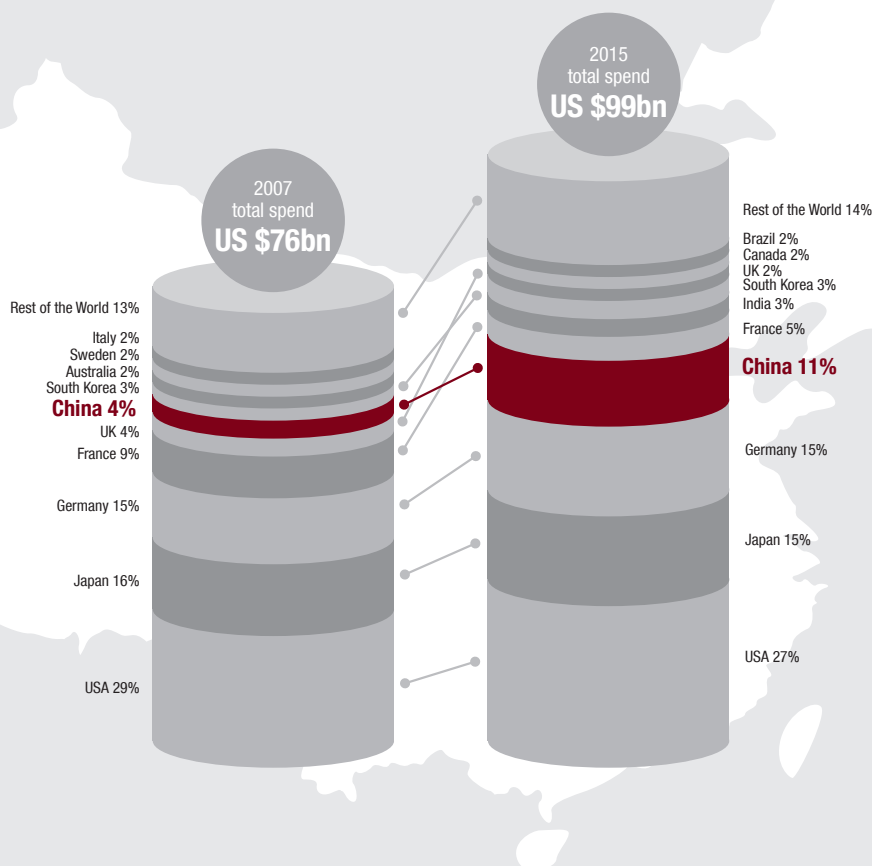
China's share of total automotive R&D has jumped dramatically

In 2007, R&D spending by automotive companies in China made up just 4% of total automotive R&D outlays by Global Innovation 1000 companies. In 2015, China's share had risen to 11%.

“**The speed of China's R&D spending growth is consistent with their increased share of the world's automotive demand. This is only the beginning.**

Evan Hirsh, Principal, PwC US Automotive & Industrials practices, Strategy&

Exhibit 2
Top 10 Countries by Total (Domestic & Imported) as a Percentage of Automotive R&D



Sources: Strategy&2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

Automotive companies rank #3 in cash outlays, but are #5 in R&D intensity

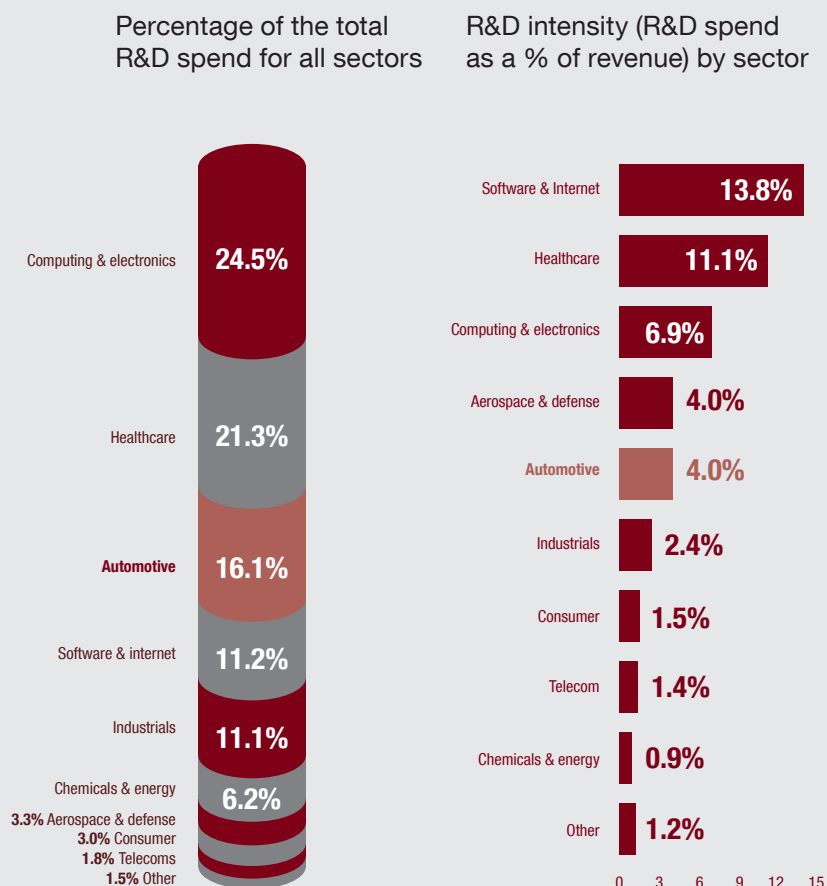
When you take a look at how much Global Innovation 1000 companies in different sectors spend on R&D as a percentage of revenues, software & Internet leads the pack. Their R&D intensity is more than triple that of the automotive industry.

That's an important gap, when you consider how important software is becoming to the automotive industry. As we've shown in other research, the 'connected car' is becoming an increasingly important source of revenues for automotive companies.

And OEMs in particular are now looking to innovate not just on products, but also on business models. Some of the mobility solutions of the future are likely to rely on excellence in managing IT platforms and cloud-based ecosystems.

If automotive OEMs and suppliers want to retain their share of value creation, they'll need to be able to drive innovation more like software & Internet companies do. That means faster innovation cycles – and quite possibly increased investment too.

Exhibit 3
Percentage of total R&D spend and R&D intensity by sector



Sources: Strategy&2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

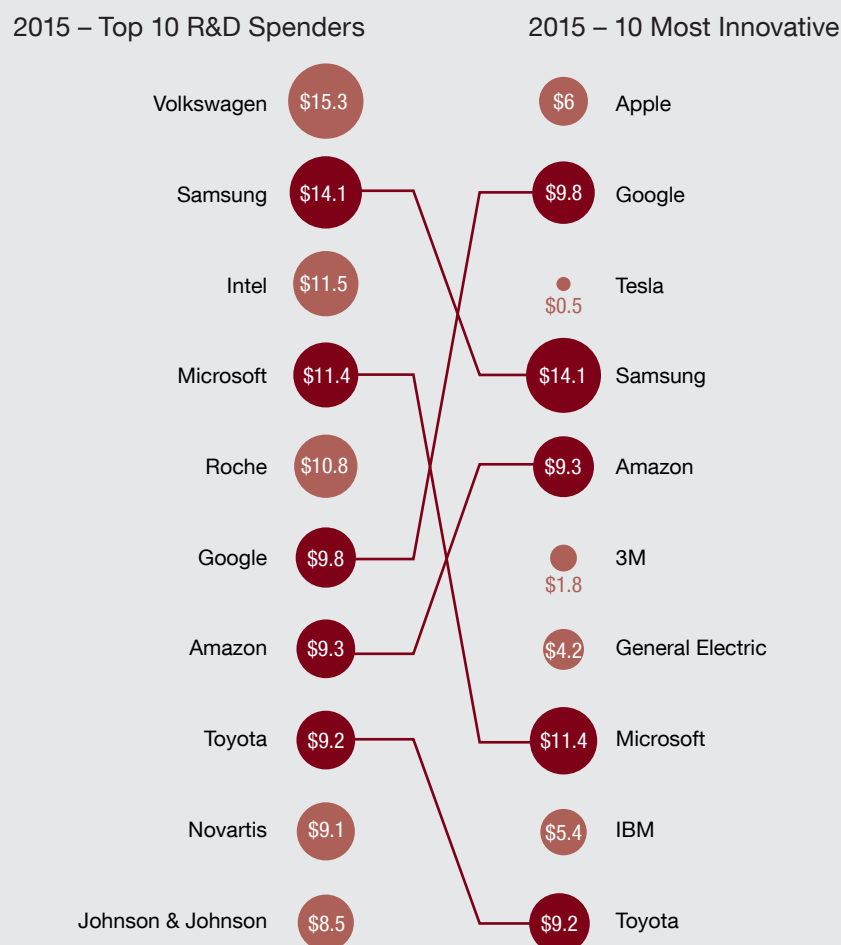
Being great at innovation takes more than cash

We asked survey participants which companies they believe are the most innovative to create our 10 Most Innovative companies list. Their responses and our list of Top 10 R&D Spenders match less often than you might expect.

Indeed, Toyota has been the only automotive company to ever make both lists – in 2010-12, and again in 2015. From 2013 to 2015, Tesla Motors has also made the 10 Most Innovative list, despite investing far less on R&D than the

industry's biggest spenders. Innovations in high-tech consumer products are much more visible than breakthroughs in back-end services or everyday goods. Automotive companies that are looking for more recognition of their strength in innovation need to focus not only on excellence in R&D itself, but also in how they communicate their success. That means embedding an integrated product and communications strategy into the entire corporate strategy and culture.

 **Exhibit 4**
Top 10 R&D Spenders and 10 Most Innovative Companies



Sources: Strategy&2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

Want to see who the top spenders and innovators were last year too? Check out our interactive list of the [Top 20 R&D Spenders and 10 Most Innovative companies, 2005-2015](#)

Automotive companies have dramatically increased their exports of auto R&D

We describe flows of innovation spending by companies and countries using terms such as “in-country” (or “in-region”) spending, “exports,” and “imports,” which serve as convenient shorthand. For example, a multinational that spends one-third of its R&D budget outside its headquartered country is considered to be exporting 33% of its R&D spending.

International R&D export includes near-shoring. For the automotive industry, significant amounts of export happens between neighboring countries in Europe and Asia-Pacific.

The automotive companies we analyzed now spend far more of their R&D budgets outside of their headquartered countries than in the past. While domestic R&D spending went up by 11% from 2007 through 2015, exported R&D increased a dramatic 42%. That’s significantly more than the increase in the other two largest sectors, computing and electronics and healthcare. Exported R&D now makes up nearly two-thirds of these automotive companies’ R&D budgets. Automotive companies increased R&D exports the most to the U.S. and China.

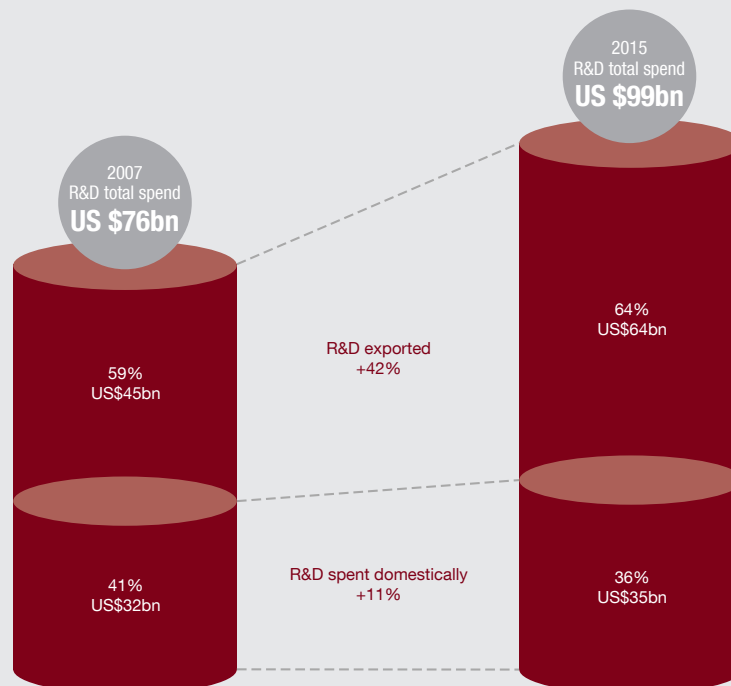
“Given the dramatic shift of automotive demand to emerging markets, we will continue to see R&D transition away from the mature markets of North America, Western Europe and Japan.

Evan Hirsh, Principal, PwC US Automotive & Industrials practices, Strategy&



Exhibit 5

Exported Automotive R&D and Automotive R&D Spend Domestically as a Percentage of Total Automotive R&D



Sources: Strategy&2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

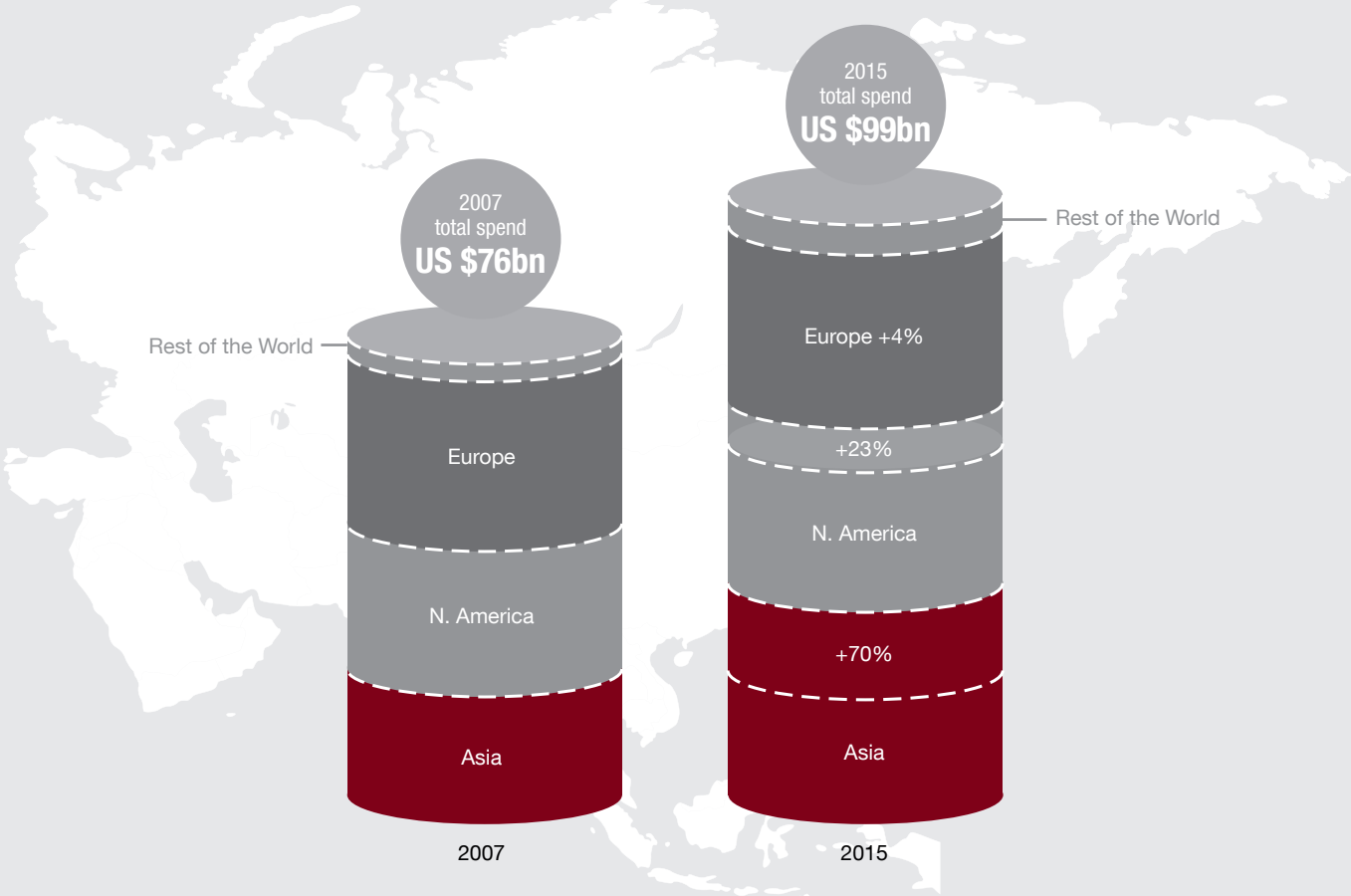
Asia is now the #1 destination for automotive R&D

From 2007 to 2015, the total amount spent on automotive R&D by the companies we studied increased 70%. That put Asia ahead of North America and Europe to become the largest regional spender on automotive R&D.

This increased spending in Asia far outpaced increases in North America and Europe and reflects the shift happening in the industry’s center of gravity.

“As domestic Chinese automobile manufacturers grow and mature, it is inevitable that they will expand their proportion of the world’s R&D spending. Clearly, innovation is no longer the sole province of the established automotive industry leaders.”
Evan Hirsh, Principal, PwC US Automotive & Industrials practices, Strategy&

Exhibit 6
Total Automotive R&D Spend (Domestic & Imported) by Region as a Percentage of Automotive R&D



Sources: Strategy& 2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

China has replaced Germany as the second-largest importer of automotive R&D

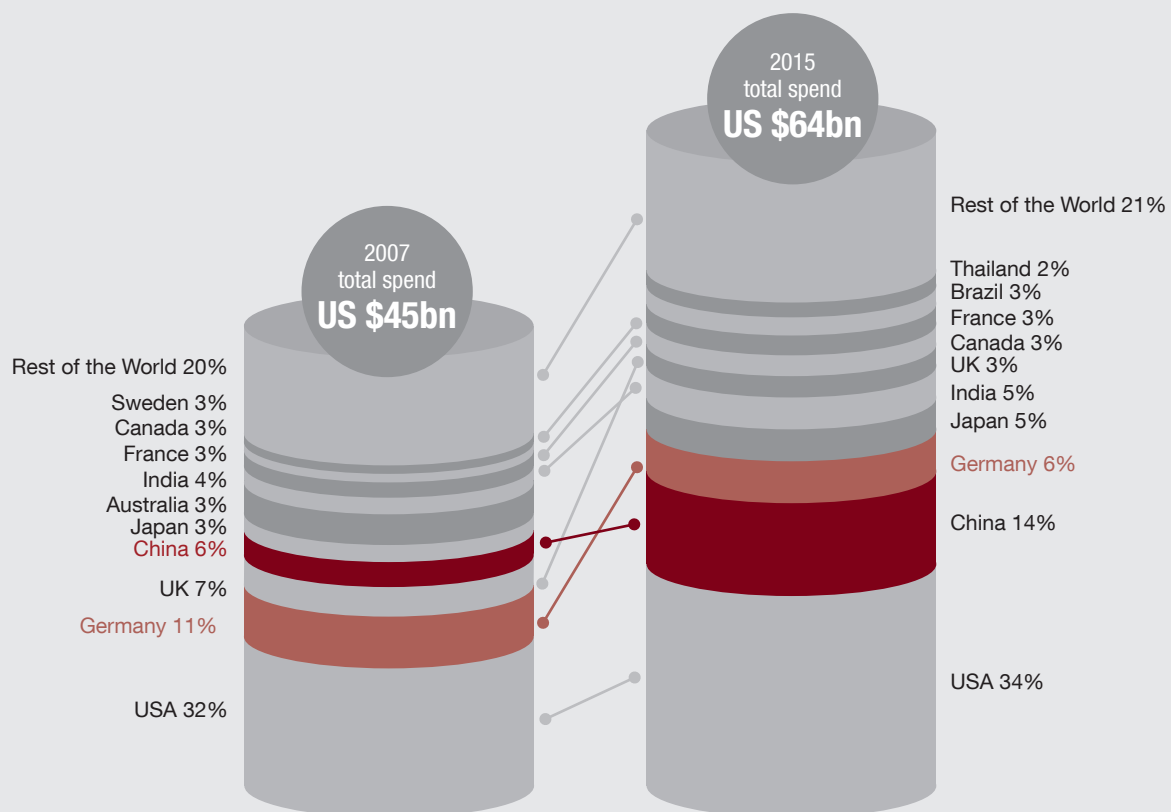
The U.S. is still the world's largest importer of automotive R&D for the companies we studied. But while in 2007, Germany was in the #2 spot, it's since been overtaken by China. Altogether, in 2015, China was the destination for 14% of all automotive R&D imported by the companies we studied.

That's more than twice as much as Germany. The companies in our sample now import just 6% of their total automotive R&D imports from Germany, compared to 11% in 2007.

“It is only natural that China imports more and more automotive R&D as their market grows; the interesting question is how soon will China transform to a meaningful exporter of auto R&D? It will undoubtedly happen and probably sooner than many think.

Evan Hirsh, Principal, PwC US Automotive & Industrials practices, Strategy&

Exhibit 7
Top 10 Countries That Imported Automotive R&D, as a Percentage of Automotive R&D Imports



Sources: Strategy& 2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

The global advantage... and the global challenge

There's a lot to be gained by taking a more global approach to R&D. The companies we studied that deployed 60 percent or more of corporate R&D spending abroad in 2015 earned a premium of 30 percent on operating margin and return on assets, and 20 percent on growth in operating income.

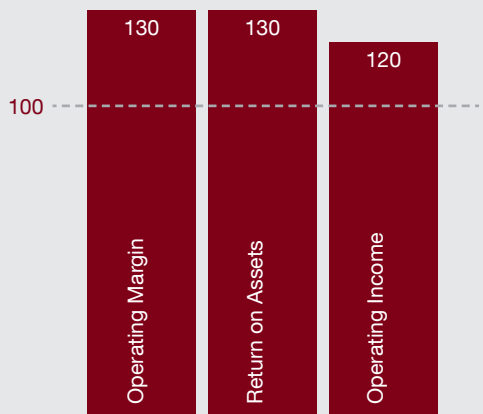
Our survey respondents reported that the most challenging aspects of conducting R&D outside the home country are finding/retaining talent (according to 53 percent of survey respondents), protecting intellectual property (51 percent), and maintaining quality and a customer focus (47 percent).



Exhibit 8

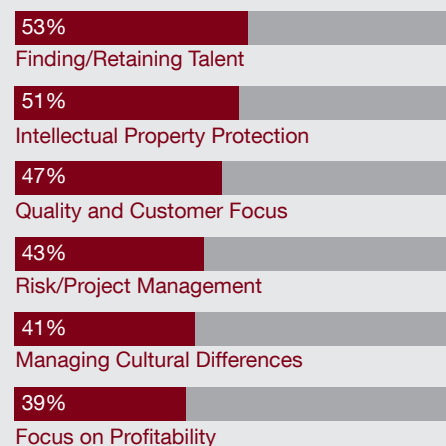
Advantages and challenges of taking a more global approach to R&D

The global advantage



Companies that deploy 60% or more of their R&D outside their home countries tend to outperform their less-global peers.

The global challenge



* Focus on profitability includes those who voted for "Currency risk" and "Return on investment"
Based on a scale of 1-5 where 1 = Not at all challenging and 5 = Extremely challenging. Percentages based on those who rated a "4" = Challenging and "5" = Extremely challenging. n=369

Sources: Strategy&2015 Global Innovation 1000 data and analysis, Bloomberg data, Capital IQ data

About the authors



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