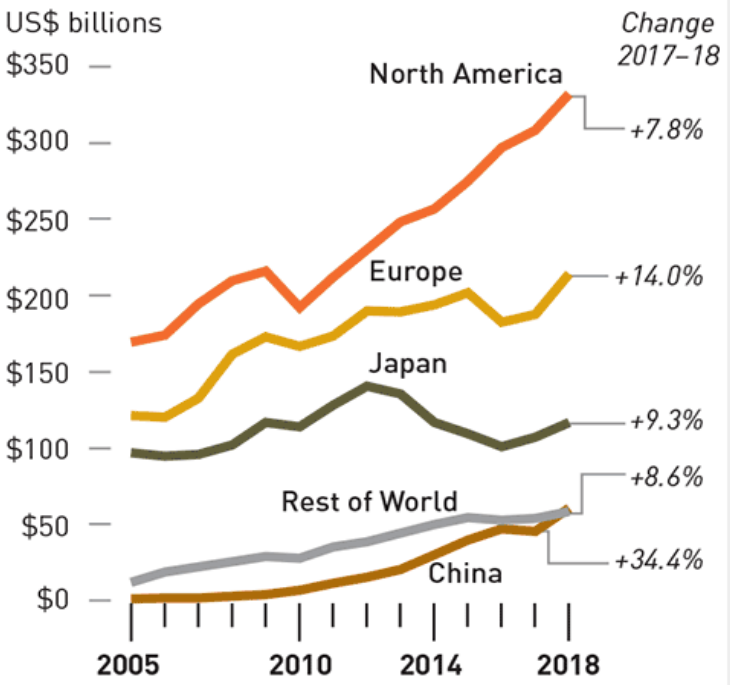


# Future of Mobility - Look from global R&D Spending

- Global R&D spending was increased YoY 11.4% in 2018, to a record high of **\$782 billion**.
- Automotive Industry R&D spending was around 15% (US\$120 billion).
- Global Automotive Industry – Transformation (Ex. CASE), Environmental Compliance and Market demand.

## R&D Spending by Region

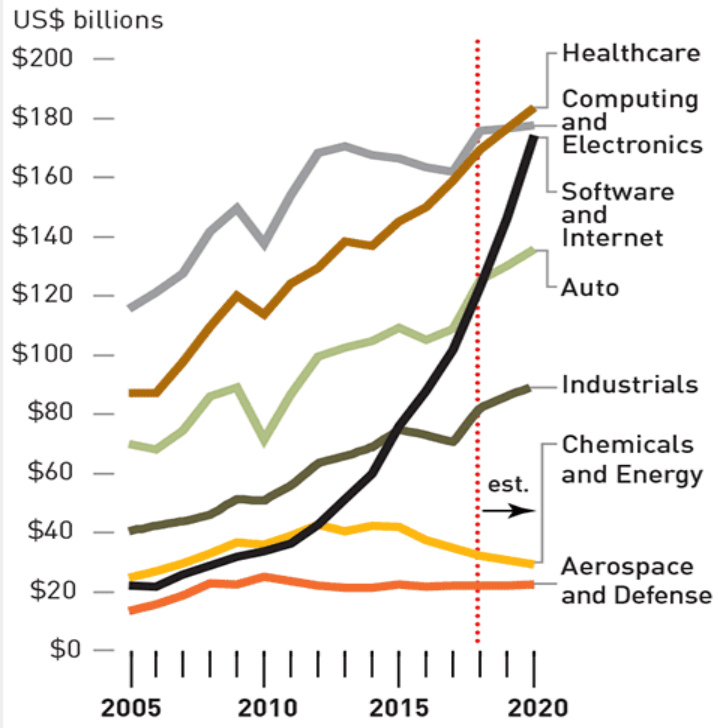
At 34 percent and 14 percent, respectively, companies headquartered in China and Europe demonstrated the most significant growth in R&D spending.



Source: Capital IQ data, Thomson Reuters Eikon data, Strategy& analysis

## R&D Spending by Industry

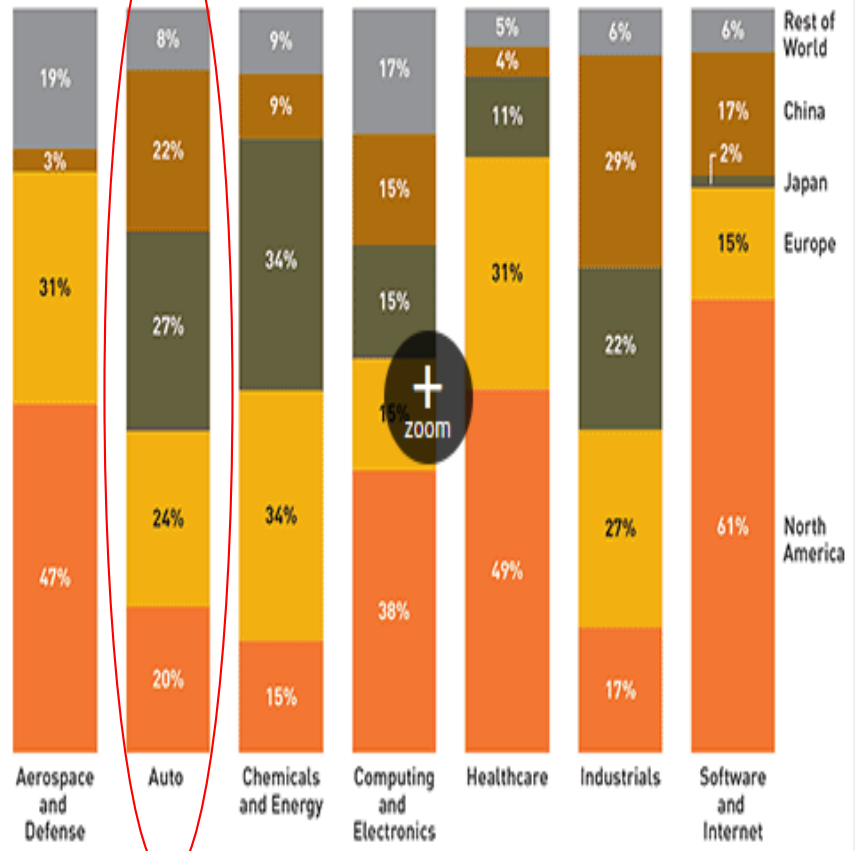
Companies in the healthcare and software and Internet sectors demonstrated sustained growth in R&D spending, which has been increasing for years in both cases.



Source: Capital IQ data, Thomson Reuters Eikon data, Strategy& analysis

## The Global Sector Spending Breakdown

North American companies made up 61 percent of the software and Internet companies in the Global Innovation 1000 in 2018, and 49 percent of the healthcare companies.



Note: Percentages may not total 100 due to rounding.

Source: Capital IQ data, Thomson Reuters Eikon data, Strategy& analysis

# Discussion

- Around 50% of automotive R&D spend in Asia-Pacific region (to enhance product portfolio).
- New product development (NPD) considering C-A-S-E to transform auto business tops in R&D spending factoring the market demand and government policies.
- Global EV makers POV – Suppliers/ LSP with a start-up mentality (be flexible with volumes), EV parts cost and weight could be an issue (risk of increasing logistics cost per car).
- China EV and Shared mobility State!
  - NEV policies – 7 million EV passenger vehicles in 2025, Credit ratings - Govt. Mandate to OEMs, and Incentives.
  - Tesla in China (May'18 – Jan'20) & Localized battery manufacturing (CATL and BYD).
  - **Ford** and **Alibaba** Explore Strategic **Collaboration** to Reimagine **Vehicle** Ownership Experience, Expand Mobility Services. ... **Ford** Motor Company and **Alibaba** Group sign Letter of Intent to jointly explore areas of **cooperation** in connectivity, cloud computing, artificial intelligence, mobility services and digital marketing
  - CAF – PHEV MP&L experience.
- India EV Stand / Enablers
  - Government – Promote R&D spend and innovation, incentives (FAME), investment/loan support, and nationwide IT /charging infrastructure (including at ports for exports).
  - OEMs – JV strategy, localization, collaboration, modularity and digitizing supply chain – Real time SC Visibility thru Big Data.
    - Build resilience capabilities to handle E2E.
- India Shared mobility Enablers.
  - Collaboration with OEMs to embrace the CASE transformation
  - More EV's in India will reduce the operating cost – promote self-drive / long-term rental model.
  - Ford Launched Office Ride in India, an App-Based Shared Mobility Solution to increase revenue opportunities and add value to consumers.

# Conclusion – India - Short/Long term

- Short-term (in next 3 years)
  - Sustain and grow the sales (automotive sales will continue to have challenges (COVID-19 pandemic, liquidity crunch, etc.)
  - Develop infrastructure, policy amendments & stimulate localization (“Make-In-India”) to increase EV’s across 2W/3W/PV.
  - Measures on cost reduction of EVs to match with ICE variants.
  - Build ‘safety’ confidence among consumers to go for EV’s (increase scale!!)
- Long-term (after 3 years)
  - Growth – EV’s and Shared mobility
  - Higher penetration of connectivity features (Big-data driven in-vehicle telematics)
  - AMP 2026 – Vision 3/12/65