

RESEARCH BULLETIN

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Industry R&D Spending To Rise 9% After Hitting Record in 2021

New update shows Intel continues to lead research and development ranking, the top 10 raised spending 18% last year, and 21 companies invested \$1 billion or more on R&D in 2021.

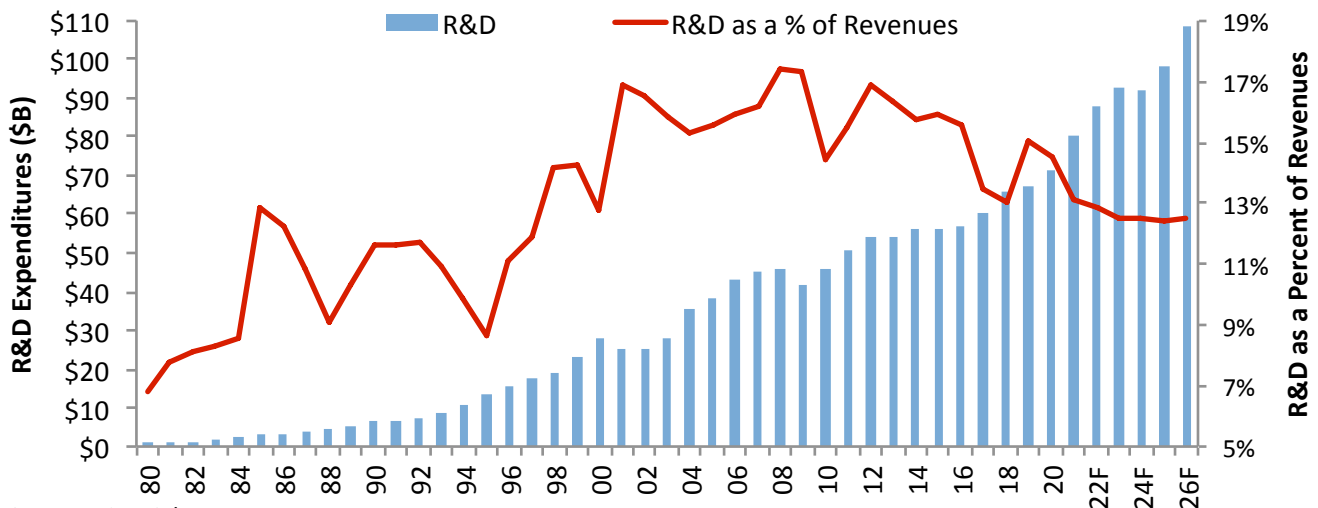
Research and development spending by semiconductor companies worldwide is forecast to grow 9% in 2022 to \$80.5 billion after climbing by an above average 13% in 2021 to a record-high \$71.4 billion, according to IC Insights' soon-to-be-released *2Q Update to The McClean Report 2022*. Total R&D spending by semiconductor companies is expected to rise by a compound annual growth rate (CAGR) of 5.5% between 2022 and 2026 to \$108.6 billion.

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When the world was hit by the Covid-19 virus health crisis in 2020, wary semiconductor suppliers kept a lid on R&D spending increases even though the chip industry's revenue grew by a surprising 11% in the year despite shutdowns of businesses and other emergency measures to slow the deadly pandemic. Semiconductor R&D spending as a percentage of worldwide industry sales slipped to a ratio of 13.1% in 2021 compared to 14.5% in 2020 and 15.1% in 2019, when research and development expenditures declined 1% and total chip market revenue fell 12%. Figure 1 plots semiconductor R&D spending levels and the industry's R&D/sales ratios over the past four decades and IC Insights' forecast through 2026.

Industry R&D Cost History and Forecast



Source: IC Insights

Figure 1

Total semiconductor R&D spending has declined in only four years since the 1980s (-1% in 2019 during an economic slowdown, -10% in 2009 after the industry was hit by a major global recession caused after financial markets melted down, and back-to-back drops of -10% in 2001 and -1% in 2002 when an economic downturn coincided with the implosion of the Internet “dot-com” bubble at the turn of the century). In the aftermath of the 2008-2009 global recession, semiconductor R&D spending recovered strongly for a few years, but then outlays slowed during the rest of the last decade for a variety of reasons, including ongoing economic uncertainty and an historic wave of acquisitions in the chip industry.

Since the year 2000, total semiconductor R&D spending as a percent of worldwide sales has exceeded the four-decade historical average of 14.5% in all but five years (2000, 2010, 2017, 2018, and 2020). In these five years, lower R&D-to-sales ratios had more to do with the strength of total revenue growth than weakness in research and development spending by semiconductor suppliers.

Intel continued to top all other semiconductor suppliers in R&D expenditures in 2021, accounting for about 19% of the industry’s total. Intel increased its R&D spending by 12% in 2021 to an all-time high of \$15.2 billion as part of its efforts to retake the lead in launching new IC processing technology generations and to position itself as a major provider of advanced wafer foundry services. In 2020, Intel’s R&D spending grew just 1% after dropping 1% in 2019.

Samsung placed second in IC Insights’ 2021 R&D ranking with expenditures that grew 13% to an estimated \$6.5 billion following a 23% increase in 2020. The South Korean memory giant has accelerated its R&D spending on leading-edge logic processes (of 5nm and below) to increase competition with foundry market leader Taiwan Semiconductor Manufacturing Co., which raised its expenditures on research and development by 20% in 2021 to about \$4.5 billion following a 26% hike in 2020.

IC Insights’ 2021 R&D ranking shows 21 semiconductor suppliers spent \$1 billion or more on research and development compared to 19 companies in 2020. The top 10 in the R&D ranking collectively increased spending by 18% to \$52.6 billion, which was about 65% of the industry’s R&D total last year. The top 10’s R&D/sales ratio was 13.5% in 2021 compared to 14.5% in 2020, says the upcoming *2Q Update*.

Report Details: *The 2022 McClean Report*

The McClean Report—A Complete Analysis and Forecast of the Semiconductor Industry, is now available. A subscription to *The McClean Report* service includes the January *Semiconductor Industry Flash Report*, which provides clients with IC Insights’ initial overview and forecast of the semiconductor industry for this year through 2026. In addition, the first of four *Quarterly Updates* to the report was released in February, with additional *Quarterly Updates* to be released in May, August, and November of this year. An individual user license to the 2022 edition of *The McClean Report* is available for \$5,390 and a multi-user worldwide corporate license is available for \$8,590. The Internet access password and the information accessible to download will be available through November 2022.

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