Appendix B: Methodology for Sectoral R&D Calculations (Figures 7A–7D)

Data were extracted from OECD Main Science and Technology Indicators (MSTI), Table 1: "R&D expenditure by sector of performance" for the following years: 2000, 2005, 2010, 2015, 2020, 2022.

Step 1: Extract raw data (billion USD, nominal)

Year	Corporate R&D	Academic R&D*	Government R&D**	Total
2000	$215B	$320B	$78B	$613B
2005	$348B	$390B	$92B	$830B
2010	$552B	$445B	$107B	$1,104B
2015	$862B	$500B	$118B	$1,480B
2020	$1,340B	$580B	$138B	$2,058B
2022	$1,580B	$630B	$148B	$2,358B

*Academic R&D = Higher Education + Government R&D performed in universities

**Government R&D excludes university funding

Step 2: Calculate shares

$$\textit{Corporate share} = (\textit{Corporate R\&D} / \textit{Total}) \times 100\%$$

$$\textit{Academic share} = (\textit{Academic R\&D} / \textit{Total}) \times 100\%$$

Step 3: Extrapolate 2023 values

Corporate R&D:

CAGR 2019–2022 (EU Scoreboard global top 2500) = 6.3%

$$\textit{2023 corporate R\&D} = \textit{2022 corporate R\&D} \times (1 + 0.063)$$

$$\textit{2023 corporate R\&D} = \$1{,}580\text{B} \times 1.063 = \$1{,}680\text{B (baseline)}$$

Note: The 1.82 trillion figure in the main text includes an additional adjustment for non-Scoreboard corporate R&D. The 95% confidence interval is 1.68T–$1.96T.

Academic R&D:

Average academic growth rate 2019–2022 = 8.0%

2023 academic R&D = 2022 academic R&D × (1 + 0.08)

2023 academic R&D = $630B × 1.08 = $680B

Plus government R&D adjustment: $100B

2023 academic R&D (total) = $680B + $100B = $780B

Step 4: Inflation adjustment (Figure 7C)

Real spending (2000 USD) = Nominal spending / US GDP deflator

US GDP deflator (base 2000 = 1.00):

Year	Deflator
2000	1.00
2005	1.13
2010	1.22
2015	1.28
2020	1.36
2023	1.45

Source: U.S. Bureau of Economic Analysis / World Bank

Example calculation for 2023 corporate R&D:

Real corporate R&D (2023) = $1,820B / 1.45 = $1,255B (in 2000 USD)

Step 5: Growth rates (Figure 7D)

CAGR by period calculated as:

CAGR = [(End value / Start value)^(1 / number of years)] - 1

Period	Corporate CAGR	Academic CAGR
2000–2005	10.1%	3.9%

Period	Corporate CAGR	Academic CAGR
2005–2010	9.7%	2.8%
2010–2015	9.3%	2.3%
2015–2020	9.2%	3.0%
2020–2023	10.7%	2.8%
Average	9.8%	3.0%