

TABLE 45-B

## R&amp;D paid for by the company and others and performed by the company outside of the United States, by selected location, industry, and company size (part B): 2022

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total outside the United States	Argentina	Brazil	Chile	Mexico	Other Latin American locations	Australia	China	Hong Kong	India	Indonesia	Japan	Malaysia	New Zealand	Singapore	South Korea	Taiwan	Thailand	Other Asian or Pacific locations	Israel	Other Middle Eastern locations	South Africa	Other African locations	Undistributed <sup>a</sup>
All industries	21-23, 31-33, 42-81	149,584	544 i	1,623	271 i	1,649	1,858 i	2,718	13,052	566	18,266	39	5,293	1,233	266	4,003	1,972	3,276	386	1,001 i	10,025	404	344 i	288	410 i
Manufacturing industries	31-33	84,419	222	1,049	170 i	1,111	1,550 i	1,305	9,207	351	8,420	22	3,299	1,127	137	2,581	1,348	2,070	338	579 i	5,772	229	75	182	261 i
Food	311	1,463	26	122	12	68	88	46	118	2	50	6	6	5	6	22	3	1	20	18	*	6	20	12	D
Beverage and tobacco products	312	630	0	D	0	D	0	*	36	9	1	2	20	0	*	21	0	0	0	5	D	0	0	0	D
Textile, apparel, and leather products	313-16	113	0	1	0	D	D	2	12	11	*	0	*	0	0	1 i	1	*	*	15 i	0	0	0	*	D
Wood products	321	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 i
Paper	322	81	0	0	0	0	0	0	6 i	0	0	0	0	0	0	1	32 i	0	0	0	0	D	0	0	D
Printing and related support activities	323	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	* i
Petroleum and coal products	324	247	0	D	0	0	0	0	33	0	5	0	2	0	0	2	*	0	0	0	0	D	0	0	D
Chemicals	325	25,061	163	375	143 i	188	287	537	2,153	83	433	8	1,722	20	15	377	257	176 i	32	48	337	123	45	22	50 i
Basic chemicals	3251	956	3	26	1	10	3	4	103 i	1	9	2	12	1	2	49	2	3	1	1	5	15	4	1	8 i
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	539	D	17	0	4	D	2	96	4	9	*	27	*	0	3	11	1	2	2	0	7	*	*	1 i
Pesticide, fertilizer, and other agricultural chemicals	3253	151	3	19	2	4	1	2	4	8	D	1	1	*	*	D	*	*	1	1	0	0	*	*	D
Pharmaceuticals and medicines	3254	22,266	151	285	139 i	154	261	527	1,746	69	386	4	1,657	16	13	222 i	240	169 i	25	32	330	98	39	19	D
Soap, cleaning compound, and toilet preparations	3256	917	3	26	1	6	19	3	154	1	10 i	1	24	1	*	87	2	*	1	2	*	2	2	2	D
Paint, coating, adhesive, and other chemicals	3255, 3259	232	D	2	1	10	D	1	51	*	D	*	2	2	0	D	2	3	1	11	2	0	*	0	D
Plastics and rubber products	326	682	D	14	1	17	D	5	139 i	*	1	1	23	0	*	1	2 i	*	6	0	17	0	D	D	D
Nonmetallic mineral products	327	159	0	2	0	5	0	0	25	*	1	0	0	0	0	0	38	5	0	0	16	0	0	0	1 i
Primary metals	331	19	0	0	0	0	0	*	2	0	0	0	0	1	0	*	0	0	0	3	0	0	0	0	* i
Fabricated metal products	332	231	D	D	*	5	D	2	15	0	5	*	63	*	*	1	*	2	*	*	0	D	D	0	D
Machinery	333	5,914	4	127	1	78	4	58	607	7	598	1	155	59	17	269	206	172 i	9	10	452	18	D	D	D
Agricultural implement	33311	990	D	D	0	D	0	D	31	0	D	0	0	*	3	0	*	0	0	0	0	0	0	0	* i
Semiconductor machinery	333242	1,636	0	0	0	0	0	0	140 i	5	226 i	0	35 i	55	0	245	197	141 i	0	1	399 i	0	0	0	* i
Engine, turbine, and power transmission equipment	3336	1,071	0	11	*	9	2	27	127	*	149	1	47	0	10	2	0	0	5	*	1	11	0	D	0
Other machinery	other 333	2,217	D	D	1 i	D	2	D	309	2	D	*	72	3	5	21	8	31	4	8	51	7	D	D	D
Computer and electronic products	334	35,536	D	D	1	198	1,068 i	177	4,348	88	6,629	3	995	1,031	91	1,614	367	1,650	235	431 i	4,497	41	D	D	D
Communications equipment	3342	3,509	D	D	0	25 i	0	60	355	13	971	0	D	D	13	19 i	21	82	D	*	221	7	D	D	0

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Semiconductor and other electronic components	3344	21,784	D	D	*	151	D	25 i	3,114	36 i	4,882	1	614	740	D	1,105	228	1,030	D	361 i	3,313	6	0	D	D
Navigational, measuring, electromedical, and control instruments	3345	2,668	*	D	*	9	D	48	289	14	110	2	50	56	29	106	9	18	1 i	35	54	6	3	D	D
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	429	*	*	D	D	D	10	9	*	2	*	2	*	*	70	1	1	*	1	15	6	*	D	* i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	327	0	5	0	1	0	5	2	0	30	0	*	2	28	8	0	0	0	1	6	0	3	0	3 i
Other measuring and controlling devices	other 3345	1,912	*	D	D	D	D	33	278	14	78	2	48	54	*	28	8	17	* i	34	33	0	*	0	D
Other computer and electronic products	other 334	7,575	*	D	*	13	D	43	590	25	665	0	D	D	D	384	109	520	D	34	909	22	D	0	0
Electrical equipment, appliances, and components	335	1,575	0	49	*	64	1	3	272	3	75	*	41	*	1	32	*	20	10	2	25	1	D	0	D
Transportation equipment	336	8,035	3	249	*	445	4	344	976	D	313	0	72	*	0	168	381	26	21	D	5	6	D	D	D
Motor vehicles, bodies, trailers, and parts	3361-63	6,035	3	D	*	D	D	288	886	D	171	0	65	*	0	110 i	381	6	20	D	3	0	D	D	D
Aerospace products and parts	3364	1,819	0	D	0	D	D	55	89	*	137	0	7	0	0	59	*	*	1	3	2	6	0	0	D
Aircraft, aircraft engine, and aircraft parts	336411-13	653	0	D	0	D	D	D	D	0	D	0	7	0	0	3	*	*	*	0	0	D	0	0	D
Guided missile, space vehicle, and related parts	336414-15, 336419	1,166	0	D	0	D	0	D	D	*	D	0	*	0	0	56	0	*	*	3	2	D	0	0	0
Military armored vehicle, tank, and tank components	336992	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other transportation	other 336	181	0	0	0	0	0	*	1	0	5	0	0	0	0	0	0	19	0	0	0	0	D	0	D
Furniture and related products	337	36	0	0	0	D	0	0	0	0	0	0	0	0	0	0	0	0	0	D	0	0	0	0	0
Miscellaneous	339	4,631	2 i	22 i	12 i	28	D	131	464	D	308	1 i	201	11	5	73	60	17	5	D	D	21 i	D	D	D
Medical equipment and supplies	3391	4,234	2 i	21 i	12 i	28	89 i	105	454	2 i	282	1 i	178	6 i	5	72	44	11	5	34 i	384	21 i	D	D	D
Other miscellaneous manufacturing	3399	397	0	*	0	*	D	26	10	D	27	0	23	5	*	1	16	6	0	D	D	0	0	0	D
Nonmanufacturing industries	21-23, 42-81	65,165	321 i	574 i	101	538	308	1,413	3,845	215 i	9,846	17	1,994 i	106	129	1,423	625 i	1,205	48 i	422	4,253	175 i	269 i	106	149 i
Mining, quarrying, oil and gas extraction, and support activities	21	D	0	0	0	0	0	D	0	0	D	0	D	0	0	0	0	0	0	0	0	0	D	0	D

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Utilities	22	D	0	*	0	D	0	*	*	0	0	*	0	0	*	0	0	0	D	0	D	0	D	0	0																								
Wholesale trade	42	D	0	0	0	0	D	0	D	*	D	0	0	0	0	0	0	0	0	0	D	0	0	0	D																								
Electronic shopping and electronic auctions	454111-12	D	2	i	D	D	D	D	D	D	D	1	i	D	D	1	i	D	D	D	D	D	D	D	*	i	0																						
Transportation and warehousing	48-49	121	0	0	0	0	0	D	D	*	0	0	0	0	0	0	0	0	0	0	D	0	0	0	1	i																							
Information	51	36,948	106	i	159	56	222	156	694	2,086	95	6,626	12	428	72	75	581	233	898	16	230	3,108	35	D	D	44	i																						
Publishing	511	12,330	D	D	D	26	D	D	1,267	D	2,558	D	112	64	25	192	162	241	13	133	1,226	17	6	37	D																								
Newspaper, periodical, book, and directory publishers	5111	*	i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	i																							
Software publishers	5112	12,330	D	D	D	26	D	D	1,267	D	2,558	D	112	64	25	192	162	241	13	133	1,226	17	6	37	D																								
Telecommunications	517	201	*	0	0	D	D	*	D	D	30	0	0	0	0	D	D	*	0	0	80	*	*	0	D																								
Data processing, hosting, and related services	518	12,242	96	i	49	3	183	116	303	483	2	3,443	D	52	7	42	90	D	27	D	88	791	10	D	D	34	i																						
Other information	other 51	12,176	D	D	D	D	D	D	D	D	595	D	264	1	8	D	D	630	D	9	1,011	7	D	D	0																								
Finance and insurance	52	2,612	1	i	D	D	D	10	44	i	63	D	823	*	D	D	17	D	D	*	30	46	D	D	D	0																							
Real estate and rental and leasing	53	102	i	0	*	i	0	*	i	*	i	1	i	D	0	D	*	i	*	i	1	0	*	*	0	*	i	*	i	*	r																		
Lessors of nonfinancial intangible assets (except copyrighted works)	533	1	i	0	0	0	0	0	1	i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
Other real estate and rental and leasing	other 53	101	i	0	*	i	0	*	i	*	i	*	i	D	0	D	*	i	*	i	1	0	*	*	0	*	i	*	i	*	r																		
Professional, scientific, and technical services	54	19,028	i	212	i	224	i	34	i	276	i	107	i	323	i	1,218	29	i	1,695	i	4	i	938	i	D	36	i	407	i	D	284	i	31	i	144	i	D	D	182	i	20	i	71	i					
Architectural, engineering, and related services	5413	36	0	*	*	i	*	0	1	1	*	4	0	2	0	*	*	*	3	0	*	i	*	1	*	i	0	5	r																				
Computer systems design and related services	5415	4,575	13	47	1	i	46	36	r	44	248	*	942	2	r	63	D	2	52	D	155	i	5	r	13	r	686	11	11	6	58	i																	
Scientific research and development services	5417	13,571	i	199	i	166	i	31	i	186	i	68	i	261	i	956	i	28	i	702	i	2	i	864	i	18	i	34	i	343	i	193	i	120	i	25	i	131	i	162	i	15	i	166	i	12	i	7	i
Research and development in nanotechnology	541713	30	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	5	0	0	0	2	0	0	0	0																							
Research and development in biotechnology (except nanobiotechnology)	541714	4,073	i	58	i	37	12	i	48	i	18	i	119	i	443	12	i	178	*	i	194	i	4	i	17	i	22	i	68	i	24	i	4	i	9	i	80	i	1	i	12	i	0	1	i				

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Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	9,466	i 140	i 129	i 20	i 138	i 51	i 141	i 491	i 17	i 524	i 2	i 670	i 14	i 18	i 321	i 120	i 96	i 21	i 121	i 80	i 14	i 153	i 12	i 6	
Research and development in the social sciences and humanities	541720	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other professional, scientific, and technical services	other 54	847	* 11	2	44	3	18	13	*	46	*	10	*	*	12	17	7	*	*	D	D	6	1	1	i	
Health care services	621-23	93	0	D	0	0	0	D	D	0	0	0	D	1	0	1	0	0	0	D	0	0	0	0	D	
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	146	0	D	D	*	D	D	1	D	D	0	0	0	0	0	*	*	r *	D	D	D	0	0	D	
All companies (number of domestic employees)	-	149,584	544	i 1,623	271	i 1,649	1,858	i 2,718	13,052	566	18,266	39	5,293	1,233	266	4,003	1,972	3,276	386	1,001	i 10,025	404	344	i 288	410	i
Small companies																										
10-19 <sup>b</sup>	-	260	4	r *	0	*	4	r 5	7	4	34	0	1	4	0	0	9	5	0	1	i 10	2	*	0	29	i
20-49	-	941	10	11	r *	10	r 35	r 24	265	6	48	2	r 4	5	r 3	2	9	47	5	r 2	45	r 1	3	*	65	i
Medium companies																										
50-99	-	962	1	6	1	7	28	r 10	110	67	r 102	D	5	0	D	5	14	41	0	20	56	2	8	*	24	i
100-249	-	2,017	D	D	5	15	D	28	188	13	234	0	21	5	3	16	39	114	1	23	145	10	1	1	28	i
Large companies																										
250-499	-	4,240	7	39	1	60	28	36	479	31	477	D	60	10	D	159	159	120	*	33	306	6	6	2	8	i
500-999	-	4,657	7	i 13	8	39	51	59	256	9	600	1	65	16	35	66	18	105	13	42	519	11	2	*	D	
1,000-4,999	-	24,407	55	139	10	214	59	415	1,912	113	3,513	5	322	85	26	739	187	364	118	460	i 1,403	20	21	3	D	
5,000-9,999	-	13,616	D	D	4	116	D	184	1,529	14	1,177	4	845	325	i 43	924	59	293	126	58	546	57	12	27	1	i
10,000-24,999	-	32,036	245	i 426	37	i 340	490	i 581	2,801	79	5,619	9	1,605	i 82	69	749	657	877	47	80	795	72	145	i 33	3	i
25,000 or more	-	66,448	200	i 911	204	i 847	618	1,376	5,505	231	6,463	16	2,365	701	76	1,344	822	1,310	75	283	6,201	224	147	i 223	D	

\* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

<sup>a</sup> Includes data reported that were not allocated to a specific country.

<sup>b</sup> The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

**Note(s):**

Detail may not add to total because of rounding. Country detail was not collected from companies reporting less than \$1 million of R&D paid for by the company or reporting less than \$1 million of R&D paid for by others. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018.

**Source(s):**

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2022.