

	Y1	X2	X3	X4
Year	Gross domestic spending on R&D Total, Million US dollars	Gross domestic product (GDP)Total, Million US dollars	Electric power consumption (kWh per capita)	Foreign direct investment, Million net inflows (BoP, current US\$)
1994	17,139.90	1,991,797.78	620.28	35,849.20
1995	17,168.36	2,256,219.80	770.28	40,180.00
1996	18,698.60	2,525,638.01	821.08	44,237.00
1997	23,163.39	2,806,345.47	852.74	43,751.00
1998	25,300.04	3,060,359.02	870.62	38,753.00
1999	31,564.66	3,342,586.29	913.96	42,095.30
2000	40,801.20	3,707,487.59	992.94	47,053.00
2001	46,536.59	4,104,792.56	1,076.55	53,073.62
2002	57,134.82	4,550,443.10	1,194.86	57,900.94
2003	66,584.86	5,100,094.00	1,379.48	68,117.27
2004	79,510.94	5,766,967.36	1,585.84	104,108.69
2005	95,345.55	6,624,265.14	1,782.31	124,082.04
2006	112,455.87	7,692,799.95	2,039.01	156,249.34
2007	128,943.33	9,023,650.35	2,325.93	171,534.65
2008	148,821.06	10,087,286.95	2,446.37	131,057.05
2009	187,453.39	11,119,602.00	2,612.46	243,703.43
2010	213,485.64	12,445,651.09	2,943.59	280,072.22
2011	242,941.38	13,919,132.45	3,298.00	241,213.87
2012	281,426.55	15,301,053.47	3,474.99	290,928.43
2013	316,856.22	16,779,114.38	3,773.41	268,097.18
2014	345,376.16	18,344,523.39	3,927.04	242,489.33
2015	375,751.27	19,820,982.32	3,873.42	174,749.58
2016	411,232.63	21,387,606.58	4,059.12	166,083.76
2017	444,755.12	23,266,768.93	4,244.83	203,492.01
2018	494,683.33	25,361,744.19	4,430.53	272,407.16

Y1 <https://data.oecd.org/gdp/gross-domestic-product-gdp.htm>

x2 <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>

$Y1 = -28217.4 + 0.0247881 X2t - 24.6759 X3t + 0.0314658 X4t + Ut$

Elasticity

Year	Gross domestic spending on R&D Total, Million US dollars	Gross domestic product (GDP)Total, Million US dollars	Electric power consumption (kWh per capita)	Foreign direct investment, Million net inflows (BoP, current US\$)
1994	6977.5331	7.0760	-2.1936	0.1617
1995	9966.9398	5.6113	-1.9070	0.1268
1996	15519.4110	4.0340	-1.3055	0.0897
1997	21681.0884	3.2085	-0.9705	0.0635
1998	27379.2161	2.7707	-0.7847	0.0445
1999	33410.6549	2.4799	-0.6750	0.0396

2000	40662.9617	2.2601	-0.6026	0.0364
2001	48637.7938	2.0920	-0.5462	0.0343
2002	56917.1835	1.9818	-0.5180	0.0320
2003	66307.5797	1.9066	-0.5134	0.0323
2004	78878.6277	1.8123	-0.4961	0.0415
2005	95909.7309	1.7121	-0.4586	0.0407
2006	117074.4828	1.6288	-0.4298	0.0420
2007	143464.8859	1.5591	-0.4001	0.0376
2008	165584.7344	1.5101	-0.3646	0.0249
2009	190620.0116	1.4460	-0.3382	0.0402
2010	216463.6088	1.4252	-0.3356	0.0407
2011	243020.2197	1.4198	-0.3349	0.0312
2012	274472.4814	1.3819	-0.3124	0.0334
2013	303028.6834	1.3726	-0.3073	0.0278
2014	337235.2438	1.3484	-0.2873	0.0226
2015	373025.6430	1.3171	-0.2562	0.0147
2016	407004.1908	1.3026	-0.2461	0.0128
2017	450179.7220	1.2811	-0.2327	0.0142
2018	499696.2348	1.2581	-0.2188	0.0172

	Y1	X2	X3	X4
Year	Y1- Gross domestic spending on R&D Total, Million US dollars	X2-Gross domestic product (GDP)Total, Million US dollars	X3- Electric power consumption (kWh per capita)	X4- Foreign direct investment, Million net inflows (BoP, current US\$)
1994	17,139.90	1,991,797.78	620.28	35,849.20
1995	17,168.36	2,256,219.80	770.28	40,180.00
1996	18,698.60	2,525,638.01	821.08	44,237.00
1997	23,163.39	2,806,345.47	852.74	43,751.00
1998	25,300.04	3,060,359.02	870.62	38,753.00
1999	31,564.66	3,342,586.29	913.96	42,095.30
2000	40,801.20	3,707,487.59	992.94	47,053.00
2001	46,536.59	4,104,792.56	1,076.55	53,073.62
2002	57,134.82	4,550,443.10	1,194.86	57,900.94
2003	66,584.86	5,100,094.00	1,379.48	68,117.27
2004	79,510.94	5,766,967.36	1,585.84	104,108.69
2005	95,345.55	6,624,265.14	1,782.31	124,082.04
2006	112,455.87	7,692,799.95	2,039.01	156,249.34
2007	128,943.33	9,023,650.35	2,325.93	171,534.65
2008	148,821.06	10,087,286.95	2,446.37	131,057.05
2009	187,453.39	11,119,602.00	2,612.46	243,703.43
2010	213,485.64	12,445,651.09	2,943.59	280,072.22
2011	242,941.38	13,919,132.45	3,298.00	241,213.87

2012	281,426.55	15,301,053.47	3,474.99	290,928.43
2013	316,856.22	16,779,114.38	3,773.41	268,097.18
2014	345,376.16	18,344,523.39	3,927.04	242,489.33
2015	375,751.27	19,820,982.32	3,873.42	174,749.58
2016	411,232.63	21,387,606.58	4,059.12	166,083.76
2017	444,755.12	23,266,768.93	4,244.83	203,492.01
2018	494,683.33	25,361,744.19	4,430.53	272,407.16

<https://data.oecd.org/rd/researchers.htm>

1	7.25
5.9905	1

0.023567605
-0.141181739

1.61104
-265

M	45.317
	-6.473

$$y1t = -1.6104 - 7.25 y2t + 0.0229 x2t - 0.0213 x4t + 2.7904 x7t + u1t$$

$$y2t = -265 - 5.9905 y1 - 0.00233 x3t + 0.646 x5t + 2.3007 x6t + u2t$$

Year	Y-theoretical	X2-Gross domestic product (GDP)Total, Million US dollars	X4- Foreign direct investment, Million net inflows (BoP, current US\$)	Y2- Exports of goods and services (% of GDP)
1994	44719.10934	1.019970429	-0.017075205	-0.002910274
1995	50682.18524	1.019439736	-0.016886288	-0.002563897
1996	56754.14425	1.019081711	-0.016602278	-0.002490134
1997	63201.17544	1.016837278	-0.01474492	-0.002104104
1998	69125.41067	1.013841668	-0.011941179	-0.001904937
1999	75497.58406	1.013876497	-0.011876273	-0.002006388
2000	83753.05399	1.013711879	-0.011966476	-0.001758301
2001	92706.34366	1.013951644	-0.012194075	-0.001770908
2002	102777.7225	1.013888462	-0.011999585	-0.001903238
2003	115117.7121	1.014545464	-0.012603603	-0.001956212
2004	129602.6408	1.01898813	-0.017110108	-0.00189245
2005	148794.0419	1.019500981	-0.017762454	-0.001755809
2006	172583.0496	1.020755626	-0.019284112	-0.001488572

2007	202755.1981	1.019167918	-0.018020194	-0.001165789
2008	228032.1894	1.013009925	-0.01224176	-0.000786891
2009	249253.539	1.021605899	-0.020825715	-0.000790736
2010	278850.0814	1.02207397	-0.021393353	-0.000690763
2011	313428.6595	1.01697188	-0.016392424	-0.000589674
2012	344022.5015	1.018520948	-0.018012704	-0.00051841
2013	378363.9639	1.01553466	-0.015092531	-0.00045209
2014	414772.9946	1.012818075	-0.01245265	-0.000374816
2015	450039.3495	1.008579573	-0.008270757	-0.000318199
2016	486098.3494	1.007566043	-0.007277507	-0.000297741
2017	528337.7907	1.008462801	-0.008203804	-0.000267788
2018	574797.1722	1.010415447	-0.01009447	-0.000329406

Exports of goods and services (% of GDP)	Inflation, GDP deflator (annual %)	Population, total
17.95	13.6705391	1204855000
17.92	6.501095946	1217550000
19.49	1.622160415	1230075000
18.34	-0.892589361	1241935000
18.16	-1.268409649	1252735000
20.89	2.06146138	1262645000
20.31	2.043115008	1271850000
22.64	0.604850658	1280400000
26.98	2.605441209	1288400000
31.06	6.954321801	1296075000
33.83	3.902639778	1303720000
36.04	3.927910852	1311020000
35.43	7.749179838	1317885000
32.60	7.791801942	1324655000
24.75	-0.210533902	1331260000
27.19	6.881144874	1337705000
26.57	8.07559638	1344130000
25.49	2.335120681	1350695000
24.60	2.161019142	1357380000
23.59	0.791192996	1364270000
21.44	0.062699386	1371220000
19.75	1.07275629	1378665000
19.96	3.884169895	1386395000
19.51	2.933332312	1392730000
26.12	2.553161002	1405963859

Y2	X5	X6	X7
Y2- Exports of goods and services (% of GDP)	X5- Inflation, GDP deflator (annual %)	X6- Population, total	X7- ResearchersTotal, Per 1 000 employed
17.95	13.67	1,204,855,000.00	0.82
17.92	6.50	1,217,550,000.00	0.77
19.49	1.62	1,230,075,000.00	0.79
18.34	-0.89	1,241,935,000.00	0.84
18.16	-1.27	1,252,735,000.00	0.69
20.89	2.06	1,262,645,000.00	0.74
20.31	2.04	1,271,850,000.00	0.96
22.64	0.60	1,280,400,000.00	1.02
26.98	2.61	1,288,400,000.00	1.11
31.06	6.95	1,296,075,000.00	1.17
33.83	3.90	1,303,720,000.00	1.25
36.04	3.93	1,311,020,000.00	1.50
35.43	7.75	1,317,885,000.00	1.63
32.60	7.79	1,324,655,000.00	1.89
24.75	-0.21	1,331,260,000.00	2.11
27.19	6.88	1,337,705,000.00	1.52
26.57	8.08	1,344,130,000.00	1.59
25.49	2.34	1,350,695,000.00	1.72

24.60	2.16	1,357,380,000.00	1.83
23.59	0.79	1,364,270,000.00	1.93
21.44	0.06	1,371,220,000.00	1.97
19.75	1.07	1,378,665,000.00	2.09
19.96	3.88	1,386,395,000.00	2.18
19.51	2.93	1,392,730,000.00	2.24
26.12	2.55	1,405,963,858.70	2.31

-0.170865137
0.023567605

-0.0229	0	0.0213	0	0
0	-0.00233	0	-0.646	-2.3007

-0.001	0.0004	0.001	0.110	0.393
0.003	-0.0001	-0.003	-0.015	-0.054

$Y1=Y2+x2+x4+x7$ $Y2=Y1+X3+X5+X6$

X7- ResearchersTotal, Per 1 000 employed
0.00005106
0.00004222
0.00003908
0.00003723
0.00002775
0.00002749
0.00003213
0.00003071
0.00003003
0.00002834
0.00002685
0.00002810
0.00002639

Year	Y2-theoretical	X3- Electric power consumption (kWh per capita)
1994	2771906964	0.000724801
1995	2801114175	0.000899626
1996	2829921273	0.000958476
1997	2857180827	0.000994935
1998	2882015587	0.001015284
1999	2904777998	0.0010653
2000	2925900609	0.001156779
2001	2945537235	0.001253553
2002	2963879348	0.001390617
2003	2981480612	0.001604693
2004	2998992028	0.001843815
2005	3015692280	0.002071216
2006	3031384088	0.002368347

0.00002601
0.00002579
0.00001701
0.00001592
0.00001536
0.00001485
0.00001422
0.00001327
0.00001296
0.00001252
0.00001184
0.00001123

2007	3046861058	0.002700254
2008	3061938099	0.002838665
2009	3076534687	0.003029878
2010	3091160739	0.003412221
2011	3106088375	0.003821158
2012	3121238009	0.004024216
2013	3136877589	0.004367628
2014	3152696604	0.004543204
2015	3169643354	0.00447894
2016	3187215215	0.004691347
2017	3201589332	0.004903543
2018	3231737376	0.005115528

-2.7904
0

-0.066
0.394

X5- Inflation, GDP deflator (annual %)	X6- Population, total
3.18595E-09	1.000037135
1.4993E-09	1.00003681
3.70299E-10	1.000039676
-2.01812E-10	1.000048659
-2.84312E-10	1.000052681
4.58453E-10	1.000065187
4.51093E-10	1.000083627
1.32653E-10	1.000094735
5.67876E-10	1.000115569
1.5068E-09	1.000133873
8.40651E-10	1.000158912
8.41409E-10	1.000189487
1.65138E-09	1.000222318

1.65203E-09	1.000253605
-4.44179E-11	1.000291248
1.44488E-09	1.000365088
1.68766E-09	1.00041381
4.85655E-10	1.000468632
4.47264E-10	1.000540221
1.62936E-10	1.000605188
1.28474E-11	1.000656343
2.18637E-10	1.000710241
7.87262E-10	1.000773014
5.91872E-10	1.000832267
5.10358E-10	1.000917053

Year	Y1- Gross domestic spending on R&D Total, Million US dollars	X2-Gross domestic product (GDP)Total, Million US dollars	X3- Electric power consumption (kWh per capita)
1994	17,139.90	1,991,797.78	620.28
1995	17,168.36	2,256,219.80	770.28
1996	18,698.60	2,525,638.01	821.08
1997	23,163.39	2,806,345.47	852.74
1998	25,300.04	3,060,359.02	870.62
1999	31,564.66	3,342,586.29	913.96
2000	40,801.20	3,707,487.59	992.94
2001	46,536.59	4,104,792.56	1,076.55
2002	57,134.82	4,550,443.10	1,194.86
2003	66,584.86	5,100,094.00	1,379.48
2004	79,510.94	5,766,967.36	1,585.84
2005	95,345.55	6,624,265.14	1,782.31
2006	112,455.87	7,692,799.95	2,039.01
2007	128,943.33	9,023,650.35	2,325.93
2008	148,821.06	10,087,286.95	2,446.37
2009	187,453.39	11,119,602.00	2,612.46
2010	213,485.64	12,445,651.09	2,943.59
2011	242,941.38	13,919,132.45	3,298.00
2012	281,426.55	15,301,053.47	3,474.99
2013	316,856.22	16,779,114.38	3,773.41
2014	345,376.16	18,344,523.39	3,927.04
2015	375,751.27	19,820,982.32	3,873.42
2016	411,232.63	21,387,606.58	4,059.12
2017	444,755.12	23,266,768.93	4,244.83
2018	494,683.33	25,361,744.19	4,430.53

X4- Foreign direct investment, Million net inflows (BoP, current US\$)	Y2- Exports of goods and services	X5- Inflation, GDP deflator (annual	X6- Population, total	X7- ResearchersTotal, Per 1 000 employed
35,849.20	17.95	13.67054	1.2E+09	0.818323
40,180.00	17.92	6.501096	1.22E+09	0.766914
44,237.00	19.49	1.62216	1.23E+09	0.794779
43,751.00	18.34	-0.89259	1.24E+09	0.843168
38,753.00	18.16	-1.26841	1.25E+09	0.687317
42,095.30	20.89	2.061461	1.26E+09	0.7439
47,053.00	20.31	2.043115	1.27E+09	0.964226
53,073.62	22.64	0.604851	1.28E+09	1.02027
57,900.94	26.98	2.605441	1.29E+09	1.106066
68,117.27	31.06	6.954322	1.3E+09	1.169182
104,108.69	33.83	3.90264	1.3E+09	1.247242
124,082.04	36.04	3.927911	1.31E+09	1.498651
156,249.34	35.43	7.74918	1.32E+09	1.632154
171,534.65	32.60	7.791802	1.32E+09	1.889753
131,057.05	24.75	-0.21053	1.33E+09	2.107379
243,703.43	27.19	6.881145	1.34E+09	1.519638
280,072.22	26.57	8.075596	1.34E+09	1.591013
241,213.87	25.49	2.335121	1.35E+09	1.724792
290,928.43	24.60	2.161019	1.36E+09	1.830435
268,097.18	23.59	0.791193	1.36E+09	1.9279
242,489.33	21.44	0.062699	1.37E+09	1.973102
174,749.58	19.75	1.072756	1.38E+09	2.09039
166,083.76	19.96	3.88417	1.39E+09	2.180555
203,492.01	19.51	2.933332	1.39E+09	2.241682
272,407.16	26.12	2.553161	1.41E+09	2.313191