

APPENDIX B

CONVERSIONS

A Note About Heating Values

The heat content of a fuel is the quantity of energy released by burning a unit amount of that fuel. However, this value is not absolute and can vary according to several factors. For example, empirical formulae for determining the heating value of liquid fuels depend on the fuels' American Petroleum Institute (API) gravity. The API gravity varies depending on the percent by weight of the chemical constituents and impurities in the fuel, both of which are affected by the combination of raw materials used to produce the fuel and by the type of manufacturing process. Temperature and climatic conditions are also factors.

Because of these variations, the heating values in Table B.1 may differ from values in other publications. The figures in this report are representative or average values, not absolute ones. The gross heating values used here agree with those used by the Energy Information Administration (EIA).

Heating values fall into two categories, gross and net. If the products of fuel combustion are cooled back to the initial fuel-air or fuel-oxidizer mixture temperature and the water formed during combustion is condensed, the energy released by the process is the higher (gross) heating value. If the products of combustion are cooled to the initial fuel-air temperature, but the water is considered to remain as a vapor, the energy released by the process is lower (net) heating value. Usually the difference between the gross and net heating values for fuels used in transportation is around 5 to 8 percent; however, it is important to be consistent in their use.

Table B.1
Approximate Heat Content for Various Fuels

Automotive gasoline	125,000 Btu/gal(gross) = 115,400 Btu/gal(net)
Diesel motor fuel	138,700 Btu/gal (gross) = 128,700 Btu/gal (net)
Biodiesel	126,206 Btu/gal (gross) = 117,093 Btu/gal (net)
Methanol	64,600 Btu/gal (gross) = 56,560 Btu/gal (net)
Ethanol	84,600 Btu/gal (gross) = 75,670 Btu/gal (net)
Gasohol	120,900 Btu/gal (gross) = 112,417 Btu/gal (net)
Aviation gasoline	120,200 Btu/gal (gross) = 112,000 Btu/gal (net)
Propane	91,300 Btu/gal (gross) = 83,500 Btu/gal (net)
Butane	103,000 Btu/gal (gross) = 93,000 Btu/gal (net)
Jet fuel (naphtha)	127,500 Btu/gal (gross) = 118,700 Btu/gal (net)
Jet fuel (kerosene)	135,000 Btu/gal (gross) = 128,100 Btu/gal (net)
Lubricants	144,400 Btu/gal (gross) = 130,900 Btu/gal (net)
Waxes	131,800 Btu/gal (gross) = 120,200 Btu/gal (net)
Asphalt and road oil	158,000 Btu/gal (gross) = 157,700 Btu/gal (net)
Petroleum coke	143,400 Btu/gal (gross) = 168,300 Btu/gal (net)
Natural gas	
Wet	1,109 Btu/ft ³
Dry	1,027 Btu/ft ³
Compressed	20,551 Btu/pound 960 Btu/cubic foot
Liquid	90,800 Btu/gal (gross) = 87,600 Btu/gal (net)
Crude petroleum	138,100 Btu/gal (gross) = 131,800 Btu/gal (net)
Fuel Oils	
Residual	149,700 Btu/gal (gross) = 138,400 Btu/gal (net)
Distillate	138,700 Btu/gal (gross) = 131,800 Btu/gal (net)
Coal	
Anthracite - Consumption	21.711 x 10 ⁶ Btu/short ton
Bituminous and lignite - Consumption	21.012 x 10 ⁶ Btu/short ton
Production average	21.352 x 10 ⁶ Btu/short ton
Consumption average	21.015 x 10 ⁶ Btu/short ton

Table B.2
Fuel Equivalents

1 million bbl crude oil/day	= 0.365 billion bbl crude oil/year = 2.117 quadrillion Btu/year = 100.465 million short tons coal/year = 91.142 million metric tons coal/year = 2.065 trillion ft ³ natural gas/year = 2,233.435 petajoules/year
1 billion bbl crude oil/year	= 2.740 million bbl crude oil/day = 5.800 quadrillion Btu/year = 275.247 million short tons coal/year = 249.704 million metric tons coal/year = 5.659 trillion ft ³ natural gas/year = 6,119 petajoules/year
1 quadrillion Btu/year	= 0.472 million bbl crude oil/day = 172,414 million bbl crude oil/year = 47,456 million short tons coal/year = 43,052 million metric tons coal/year = 975,610 billion ft ³ natural gas/year = 1,055 petajoules/year
1 billion short tons coal/year	= 0.907 billion metric tons coal/year = 9,954 million bbl crude oil/day = 3.633 billion bbl crude oil/year = 21.072 quadrillion Btu/year = 20.558 trillion ft ³ natural gas/year = 22,230.960 petajoules/year
1 billion metric tons coal/year	= 1.102 billion short tons coal/year = 9,030 million bbl crude oil/day = 3.296 billion bbl crude oil/year = 19.117 quadrillion Btu/year = 18.650 trillion ft ³ natural gas/year = 20,167.927 petajoules/year
1 trillion ft ³ natural gas/year	= 0.484 million bbl crude oil/day = 0.177 billion bbl crude oil/year = 1.025 quadrillion Btu/year = 48.643 million short tons coal/year = 44.129 million metric tons coal/year = 1,081.375 petajoules/year
1 petajoule/year	= 447.741 bbl crude oil/day = 163.425 thousand bbl crude oil/year = 0.948 trillion Btu/year = 44.982 thousand short tons coal/year = 40.808 thousand metric tons coal/year = 0.925 billion ft ³ natural gas/year

Table B.3
Energy Unit Conversions

1 Btu	= 778.2 ft-lb = 107.6 kg-m = 1055 J = 39.30×10^{-5} hp-h = 39.85×10^{-5} metric hp-h = 29.31×10^{-5} kWhr	1 kWhr	= 3412 Btu ^a = 2.655×10^6 ft-lb = 3.671×10^5 kg-m = 3.600×10^6 J = 1.341 hp-h = 1.360 metric hp-h
1 kg-m	= 92.95×10^{-4} Btu = 7.233 ft-lb = 9.806 J = 36.53×10^{-7} hp-h = 37.04×10^{-7} metric hp-h = 27.24×10^{-7} kWhr	1 Joule	= 94.78×10^{-5} Btu = 0.7376 ft-lb = 0.1020 kg-m = 37.25×10^{-8} hp-h = 37.77×10^{-8} metric hp-h = 27.78×10^{-8} kWhr
1 hp-h	= 2544 Btu = 1.98×10^6 ft-lb = 2.738×10^6 kgm = 2.685×10^6 J = 1.014 metric hp-h = 0.7475 kWhr	1 metric hp-h	= 2510 Btu = 1.953×10^6 ft-lb = 27.00×10^4 kg-m = 2.648×10^6 J = 0.9863 hp-h = 0.7355 kWhr

^aThis figure does not take into account the fact that electricity generation and distribution efficiency is approximately 29%. If generation and distribution efficiency are taken into account, 1 kWhr = 11,765 Btu.

Table B.4
International Energy Conversions

To:	Terajoules	Giga-calories	Million tonnes of oil equivalent	Million Btu	Gigawatt-hours
From: multiply by:					
Terajoules	1	238.8	2.388×10^{-5}	947.8	0.2778
Gigacalories	4.1868×10^{-3}	1	10^{-7}	3.968	1.163×10^{-3}
Million tonnes of oil equivalent	4.1868×10^4	10^7	1	3.968×10^7	11,630
Million Btu	1.0551×10^{-3}	0.252	2.52×10^{-8}	1	2.931×10^{-4}
Gigawatthours	3.6	860	8.6×10^{-5}	3412	1

Table B.5
Distance and Velocity Conversions

1 in.	= 83.33×10^{-3} ft	1 ft	= 12.0 in.
	= 27.78×10^{-3} yd		= 0.33 yd
	= 15.78×10^{-6} mile		= 189.4×10^{-3} mile
	= 25.40×10^{-3} m		= 0.3048 m
	= 0.2540×10^{-6} km		= 0.3048×10^{-3} km
1 mile	= 63360 in.	1 km	= 39370 in.
	= 5280 ft		= 3281 ft
	= 1760 yd		= 1093.6 yd
	= 1609 m		= 0.6214 mile
	= 1.609 km		= 1000 m
$1 \text{ ft/sec} = 0.3048 \text{ m/s} = 0.6818 \text{ mph} = 1.0972 \text{ km/h}$ $1 \text{ m/sec} = 3.281 \text{ ft/s} = 2.237 \text{ mph} = 3.600 \text{ km/h}$ $1 \text{ km/h} = 0.9114 \text{ ft/s} = 0.2778 \text{ m/s} = 0.6214 \text{ mph}$ $1 \text{ mph} = 1.467 \text{ ft/s} = 0.4469 \text{ m/s} = 1.609 \text{ km/h}$			

Table B.6
Alternative Measures of Greenhouse Gases

1 pound methane, measured in carbon units (CH_4)	=	1.333 pounds methane, measured at full molecular weight (CH_4)
1 pound carbon dioxide, measured in carbon units ($\text{CO}_2\text{-C}$)	=	3.6667 pounds carbon dioxide, measured at full molecular weight (CO_2)
1 pound carbon monoxide, measured in carbon units (CO-C)	=	2.333 pounds carbon monoxide, measured at full molecular weight (CO)
1 pound nitrous oxide, measured in nitrogen units ($\text{N}_2\text{O-N}$)	=	1.571 pounds nitrous oxide, measured at full molecular weight (N_2O)

Table B.7
Volume and Flow Rate Conversions^a

1 U.S. gal	= 231 in. ³ = 0.1337 ft ³ = 3.785 liters = 0.8321 imperial gal = 0.0238 bbl = 0.003785 m ³	1 liter	= 61.02 in. ³ = 3.531 x 10 ⁻² ft ³ = 0.2624 U.S. gal = 0.2200 imperial gal = 6.29 x 10 ⁻³ bbl = 0.001 m ³
A U.S. gallon of gasoline weighs 6.2 pounds			
1 imperial gal	= 277.4 in. ³ = 0.1606 ft ³ = 4.545 liters = 1.201 U.S. gal = 0.0286 bbl = 0.004546 m ³	1 bbl	= 9702 in. ³ = 5.615 ft ³ = 158.97 liters = 42 U.S. gal = 34.97 imperial gal = 0.15897 m ³
For Imperial gallons, multiply above values by 1.201			
1 U.S. gal/hr	= 3.209 ft ³ /day = 90.84 liter/day = 19.97 imperial gal/day = 0.5712 bbl/day		= 1171 ft ³ /year = 33157 liter/year = 7289 imperial gal/year = 207.92 bbl/year
1 liter/hr	= 0.8474 ft ³ /day = 6.298 U.S. gal/day = 5.28 imperial gal/day = 0.1510 bbl/day		= 309.3 ft ³ /year = 2299 U.S. gal/year = 1927 imperial gal/year = 55.10 bbl/year
1 bbl/hr	= 137.8 ft ³ /year = 1008 U.S. gal/day = 839.3 imperial gal/day = 3815 liter/day		= 49187 ft ³ year = 3.679 x 10 ⁵ U.S. gal/year = 3.063 x 10 ⁵ imperial gal/year = 1.393 x 10 ⁶ liter/day

^aThe conversions for flow rates are identical to those for volume measures, if the time units are identical.

Table B.8
Power Conversions

FROM	TO					
	Horsepower	Kilowatts	Metric horsepower	Ft-lb per sec	Kilocalories per sec	Btu per sec
Horsepower	1.000	0.7457	1.014	550	0.1781	0.7068
Kilowatts	1.341	1.000	1.360	737.6	0.239	0.9478
Metric horsepower	0.9863	0.7355	1.000	542.5	0.1757	0.6971
Ft-lb per sec	1.36×10^{-3}	1.356×10^{-3}	1.84×10^{-3}	1.000	0.3238×10^{-3}	1.285×10^{-3}
Kilocalories per sec	5.615	4.184	5.692	3088	1.000	3.968
Btu per sec	1.415	1.055	1.434	778.2	0.2520	1.000

Table B.9
Mass Conversions

FROM	TO				
	Pound	Kilogram	Short ton	Long ton	Metric ton
Pound	1	0.4536	5.0×10^{-4}	4.4643×10^{-4}	4.5362×10^{-4}
Kilogram	2.205	1	1.1023×10^{-3}	9.8425×10^{-4}	1.0×10^{-3}
Short ton	2000	907.2	1	0.8929	0.9072
Long ton	2240	1016	1.12	1	1.016
Metric ton	2205	1000	1.102	0.9842	1

Table B.10
Fuel Efficiency Conversions^a

MPG	Miles/liter	Kilometers/L	L/100 kilometers
10	2.64	4.25	23.52
15	3.96	6.38	15.68
20	5.28	8.50	11.76
25	6.60	10.63	9.41
30	7.92	12.75	7.84
35	9.25	14.88	6.72
40	10.57	17.00	5.88
45	11.89	19.13	5.23
50	13.21	21.25	4.70
55	14.53	23.38	4.28
60	15.85	25.51	3.92
65	17.17	27.63	3.62
70	18.49	29.76	3.36
75	19.81	31.88	3.14
80	21.13	34.01	2.94
85	22.45	36.13	2.77
90	23.77	38.26	2.61
95	25.09	40.38	2.48
100	26.42	42.51	2.35
105	27.74	44.64	2.24
110	29.06	46.76	2.14
115	30.38	48.89	2.05
120	31.70	51.01	1.96
125	33.02	53.14	1.88
130	34.34	55.26	1.81
135	35.66	57.39	1.74
140	36.98	59.51	1.68
145	38.30	61.64	1.62
150	39.62	63.76	1.57
Formula	MPG/3.785	MPG/[3.785/1.609]	235.24/MPG

Table B.11
SI Prefixes and Their Values

	Value	Prefix	Symbol
One million million millionth	10^{-18}	atto	a
One thousand million millionth	10^{-15}	femto	f
One million millionth	10^{-12}	pico	p
One thousand millionth	10^{-9}	nano	n
One millionth	10^{-6}	micro	:
One thousandth	10^{-3}	milli	m
One hundredth	10^{-2}	centi	c
One tenth	10^{-1}	deci	
One	10^0		
Ten	10^1	deca	
One hundred	10^2	hecto	
One thousand	10^3	kilo	k
One million	10^6	mega	M
One billion ^a	10^9	giga	G
One trillion ^a	10^{12}	tera	T
One quadrillion ^a	10^{15}	peta	P
One quintillion ^a	10^{18}	exa	E

^aCare should be exercised in the use of this nomenclature, especially in foreign correspondence, as it is either unknown or carries a different value in other countries. A "billion," for example, signifies a value of 10^{12} in most other countries.

Table B.12
Metric Units and Abbreviations

Quantity	Unit name	Symbol
Energy	joule	J
Specific energy	joule/kilogram	J/kg
Specific energy consumption	joule/kilogram•kilometer	J/(kg•km)
Energy consumption	joule/kilometer	J/km
Energy economy	kilometer/kilojoule	km/kJ
Power	kilowatt	Kw
Specific power	watt/kilogram	W/kg
Power density	watt/meter ³	W/m ³
Speed	kilometer/hour	km/h
Acceleration	meter/second ²	m/s ²
Range (distance)	kilometer	km
Weight	kilogram	kg
Torque	newton•meter	N•m
Volume	meter ³	m ³
Mass; payload	kilogram	kg
Length; width	meter	m
Brake specific fuel consumption	kilogram/joule	kg/J
Fuel economy (heat engine)	liters/100 km	L/100 km

Conversion of Constant Dollar Values

Many types of information in this data book are expressed in dollars. Generally, constant dollars are used--that is, dollars of a fixed value for a specific year, such as 1990 dollars. Converting current dollars to constant dollars, or converting constant dollars for one year to constant dollars for another year, requires conversion factors (Table B.13 and B.14). Table B.13 shows conversion factors for the Consumer Price Index inflation factors. Table B.14 shows conversion factors using the Gross National Product inflation factors.

Due to the size of the tables, the data in Tables B.13 and B.14 were changed to two decimal places starting with Edition 17 and data for years 1971–74 were taken off in Edition 21. However, three decimal places were used to calculate all constant dollar values.

Table B.13
Consumer Price Inflation (CPI) Index

From:	To:																											
	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1970	1.00	1.39	1.47	1.56	1.68	1.87	2.12	2.34	2.49	2.57	2.68	2.77	2.82	2.93	3.05	3.20	3.37	3.51	3.62	3.72	3.82	3.93	4.04	4.14	4.20	4.29	4.44	4.56
1975	0.72	1.00	1.06	1.13	1.21	1.35	1.53	1.69	1.79	1.85	1.93	2.00	2.04	2.11	2.20	2.30	2.43	2.53	2.61	2.69	2.75	2.83	2.92	2.98	3.03	3.10	3.20	3.29
1976	0.68	0.95	1.00	1.07	1.15	1.28	1.45	1.60	1.70	1.75	1.83	1.89	1.93	2.00	2.08	2.18	2.30	2.39	2.47	2.54	2.60	2.68	2.76	2.82	2.86	2.93	3.03	3.11
1977	0.64	0.89	0.94	1.00	1.08	1.20	1.36	1.50	1.59	1.64	1.71	1.78	1.81	1.87	1.95	2.05	2.16	2.25	2.32	2.38	2.45	2.51	2.59	2.65	2.69	2.75	2.84	2.92
1978	0.60	0.83	0.87	0.93	1.00	1.11	1.26	1.39	1.48	1.53	1.59	1.65	1.68	1.74	1.81	1.90	2.00	2.09	2.15	2.22	2.27	2.34	2.41	2.46	2.50	2.56	2.64	2.72
1979	0.53	0.74	0.78	0.83	0.90	1.00	1.13	1.25	1.33	1.37	1.43	1.48	1.51	1.56	1.63	1.71	1.80	1.88	1.93	1.99	2.04	2.10	2.16	2.21	2.25	2.29	2.37	2.44
1980	0.47	0.65	0.69	0.74	0.79	0.88	1.00	1.10	1.17	1.21	1.26	1.31	1.33	1.38	1.44	1.50	1.59	1.65	1.70	1.75	1.80	1.85	1.90	1.95	1.98	2.02	2.09	2.15
1981	0.43	0.59	0.63	0.67	0.72	0.80	0.91	1.00	1.06	1.10	1.14	1.18	1.21	1.25	1.30	1.36	1.44	1.50	1.54	1.59	1.63	1.68	1.73	1.77	1.79	1.83	1.89	1.95
1982	0.40	0.56	0.59	0.63	0.68	0.75	0.85	0.94	1.00	1.03	1.08	1.12	1.14	1.18	1.23	1.28	1.35	1.41	1.45	1.50	1.54	1.58	1.63	1.66	1.69	1.73	1.78	1.84
1983	0.39	0.54	0.57	0.61	0.65	0.73	0.83	0.91	0.97	1.00	1.04	1.08	1.10	1.14	1.19	1.24	1.31	1.37	1.41	1.45	1.49	1.53	1.58	1.61	1.64	1.67	1.73	1.78
1984	0.37	0.52	0.55	0.58	0.63	0.70	0.79	0.87	0.93	0.96	1.00	1.04	1.05	1.09	1.14	1.19	1.26	1.31	1.35	1.39	1.43	1.47	1.51	1.54	1.57	1.60	1.66	1.70
1985	0.36	0.50	0.53	0.56	0.61	0.67	0.77	0.84	0.90	0.93	0.97	1.00	1.02	1.06	1.10	1.15	1.21	1.27	1.30	1.34	1.38	1.42	1.46	1.49	1.51	1.55	1.60	1.65
1986	0.35	0.49	0.52	0.55	0.59	0.66	0.75	0.83	0.88	0.91	0.95	0.98	1.00	1.04	1.08	1.13	1.19	1.24	1.28	1.32	1.35	1.39	1.43	1.46	1.49	1.52	1.57	1.62
1987	0.34	0.47	0.50	0.53	0.57	0.64	0.73	0.80	0.85	0.88	0.91	0.95	0.96	1.00	1.04	1.09	1.15	1.20	1.24	1.27	1.30	1.34	1.38	1.41	1.43	1.47	1.52	1.56
1988	0.33	0.45	0.48	0.51	0.55	0.61	0.70	0.77	0.82	0.84	0.88	0.91	0.93	0.96	1.00	1.05	1.10	1.15	1.19	1.22	1.25	1.29	1.33	1.36	1.38	1.41	1.46	1.50
1989	0.31	0.43	0.46	0.49	0.53	0.59	0.66	0.73	0.78	0.80	0.84	0.87	0.88	0.92	0.95	1.00	1.05	1.10	1.13	1.17	1.20	1.23	1.27	1.29	1.31	1.34	1.39	1.43
1990	0.30	0.41	0.44	0.46	0.50	0.56	0.63	0.70	0.74	0.76	0.79	0.82	0.84	0.87	0.91	0.95	1.00	1.04	1.07	1.11	1.13	1.17	1.20	1.23	1.25	1.27	1.32	1.36
1991	0.28	0.40	0.42	0.44	0.48	0.53	0.60	0.67	0.71	0.73	0.76	0.79	0.80	0.83	0.87	0.91	0.96	1.00	1.03	1.06	1.09	1.12	1.15	1.18	1.20	1.22	1.26	1.30
1992	0.28	0.38	0.41	0.43	0.46	0.52	0.59	0.65	0.69	0.71	0.74	0.77	0.78	0.81	0.84	0.88	0.93	0.97	1.00	1.03	1.06	1.09	1.12	1.14	1.16	1.19	1.23	1.26
1993	0.27	0.37	0.39	0.42	0.45	0.50	0.57	0.63	0.67	0.69	0.72	0.74	0.76	0.79	0.82	0.86	0.90	0.94	0.97	1.00	1.03	1.05	1.09	1.11	1.13	1.15	1.19	1.23
1994	0.26	0.36	0.38	0.41	0.44	0.49	0.56	0.61	0.65	0.67	0.70	0.73	0.74	0.77	0.80	0.84	0.88	0.92	0.95	0.98	1.00	1.03	1.06	1.08	1.10	1.12	1.16	1.20
1995	0.25	0.35	0.37	0.40	0.43	0.48	0.54	0.60	0.63	0.65	0.68	0.71	0.72	0.75	0.78	0.81	0.86	0.89	0.92	0.95	0.97	1.00	1.03	1.05	1.07	1.09	1.13	1.16
1996	0.25	0.34	0.36	0.39	0.42	0.46	0.53	0.58	0.62	0.63	0.66	0.69	0.70	0.72	0.75	0.79	0.83	0.87	0.89	0.92	0.94	0.97	1.00	1.02	1.04	1.06	1.10	1.13
1997	0.24	0.34	0.35	0.38	0.41	0.45	0.51	0.57	0.60	0.62	0.65	0.67	0.68	0.71	0.74	0.77	0.81	0.85	0.87	0.90	0.92	0.95	0.98	1.00	1.02	1.04	1.07	1.10
1998	0.24	0.33	0.35	0.37	0.40	0.45	0.51	0.56	0.59	0.61	0.64	0.66	0.67	0.70	0.73	0.76	0.80	0.84	0.86	0.89	0.91	0.93	0.96	0.98	1.00	1.02	1.06	1.09
1999	0.23	0.32	0.34	0.36	0.39	0.44	0.49	0.55	0.58	0.60	0.62	0.65	0.66	0.68	0.71	0.74	0.78	0.82	0.84	0.87	0.89	0.91	0.94	0.96	0.98	1.00	1.03	1.06
2000	0.23	0.31	0.33	0.35	0.38	0.42	0.48	0.53	0.56	0.58	0.60	0.62	0.64	0.66	0.69	0.72	0.76	0.79	0.81	0.84	0.86	0.89	0.91	0.93	0.95	0.97	1.00	1.03
2001	0.22	0.30	0.32	0.34	0.37	0.41	0.47	0.51	0.54	0.56	0.59	0.61	0.62	0.64	0.67	0.70	0.74	0.77	0.79	0.82	0.84	0.86	0.89	0.91	0.92	0.94	0.97	1.00

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Source:

U.S. Bureau of Labor Statistics.

Table B.14
Gross National Product Implicit Price Deflator

From	To																											
	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1970	1.00	1.38	1.46	1.55	1.66	1.80	1.96	2.15	2.28	2.37	2.46	2.54	2.59	2.67	2.87	2.87	2.98	3.09	3.16	3.24	3.31	3.38	3.44	3.51	3.55	3.60	3.68	3.76
1975	0.73	1.00	1.06	1.12	1.21	1.31	1.43	1.56	1.66	1.72	1.78	1.84	1.88	1.94	2.08	2.08	2.16	2.24	2.29	2.35	2.40	2.45	2.50	2.55	2.58	2.61	2.67	2.73
1976	0.69	0.95	1.00	1.06	1.14	1.24	1.35	1.47	1.57	1.63	1.69	1.74	1.78	1.83	1.97	1.97	2.05	2.12	2.17	2.22	2.27	2.32	2.36	2.41	2.44	2.47	2.53	2.58
1977	0.65	0.89	0.94	1.00	1.07	1.16	1.27	1.39	1.47	1.53	1.59	1.64	1.67	1.72	1.85	1.85	1.92	1.99	2.04	2.09	2.13	2.18	2.22	2.26	2.29	2.32	2.38	2.43
1978	0.60	0.83	0.88	0.93	1.00	1.08	1.18	1.29	1.37	1.43	1.48	1.53	1.56	1.61	1.73	1.73	1.79	1.86	1.90	1.95	1.99	2.03	2.07	2.11	2.14	2.17	2.22	2.27
1979	0.56	0.77	0.81	0.86	0.92	1.00	1.09	1.19	1.27	1.32	1.37	1.41	1.44	1.48	1.59	1.59	1.66	1.72	1.76	1.80	1.84	1.88	1.91	1.95	1.97	2.00	2.05	2.09
1980	0.51	0.70	0.74	0.79	0.85	0.92	1.00	1.09	1.16	1.21	1.25	1.29	1.32	1.36	1.46	1.46	1.52	1.57	1.61	1.65	1.68	1.72	1.75	1.79	1.81	1.83	1.88	1.92
1981	0.47	0.64	0.68	0.72	0.77	0.84	0.91	1.00	1.06	1.10	1.15	1.18	1.21	1.24	1.34	1.34	1.39	1.44	1.47	1.51	1.54	1.57	1.60	1.63	1.65	1.68	1.72	1.75
1982	0.44	0.60	0.64	0.68	0.73	0.79	0.86	0.94	1.00	1.04	1.08	1.11	1.14	1.17	1.26	1.26	1.31	1.35	1.39	1.42	1.45	1.48	1.51	1.54	1.56	1.58	1.61	1.65
1983	0.42	0.58	0.61	0.65	0.70	0.76	0.83	0.91	0.96	1.00	1.04	1.07	1.09	1.13	1.21	1.21	1.26	1.30	1.33	1.37	1.39	1.42	1.45	1.48	1.50	1.52	1.55	1.59
1984	0.41	0.56	0.59	0.63	0.68	0.73	0.80	0.87	0.93	0.96	1.00	1.03	1.05	1.09	1.17	1.17	1.21	1.26	1.29	1.32	1.34	1.37	1.40	1.43	1.44	1.46	1.50	1.53
1985	0.39	0.54	0.57	0.61	0.65	0.71	0.77	0.85	0.90	0.93	0.97	1.00	1.02	1.05	1.13	1.13	1.17	1.22	1.25	1.28	1.30	1.33	1.36	1.38	1.40	1.42	1.45	1.48
1986	0.39	0.53	0.56	0.60	0.64	0.69	0.76	0.83	0.88	0.91	0.95	0.98	1.00	1.03	1.11	1.11	1.15	1.19	1.22	1.25	1.27	1.30	1.33	1.35	1.37	1.39	1.42	1.45
1987	0.37	0.52	0.55	0.58	0.62	0.67	0.74	0.80	0.85	0.89	0.92	0.95	0.97	1.00	1.07	1.07	1.12	1.16	1.18	1.21	1.24	1.26	1.29	1.31	1.33	1.35	1.38	1.41
1988	0.36	0.50	0.53	0.56	0.60	0.65	0.71	0.78	0.83	0.86	0.89	0.92	0.94	0.97	1.04	1.04	1.08	1.12	1.14	1.17	1.20	1.22	1.25	1.27	1.29	1.30	1.33	1.36
1989	0.35	0.48	0.51	0.54	0.58	0.63	0.69	0.75	0.80	0.83	0.86	0.88	0.90	0.93	1.00	1.00	1.04	1.08	1.10	1.13	1.15	1.18	1.20	1.22	1.24	1.26	1.28	1.31
1990	0.34	0.46	0.49	0.52	0.56	0.60	0.66	0.72	0.77	0.80	0.83	0.85	0.87	0.90	0.96	0.96	1.00	1.04	1.06	1.09	1.11	1.13	1.16	1.18	1.19	1.21	1.24	1.26
1991	0.32	0.45	0.47	0.50	0.54	0.58	0.64	0.70	0.74	0.77	0.80	0.82	0.84	0.87	0.93	0.93	0.96	1.00	1.02	1.05	1.07	1.09	1.12	1.14	1.15	1.17	1.19	1.22
1992	0.32	0.44	0.46	0.49	0.53	0.57	0.62	0.68	0.72	0.75	0.78	0.80	0.82	0.84	0.91	0.91	0.94	0.98	1.00	1.02	1.05	1.07	1.09	1.11	1.12	1.14	1.16	1.19
1993	0.31	0.43	0.45	0.48	0.51	0.56	0.61	0.66	0.70	0.73	0.76	0.78	0.80	0.82	0.89	0.89	0.92	0.95	0.98	1.00	1.02	1.04	1.06	1.08	1.10	1.11	1.14	1.16
1994	0.30	0.42	0.44	0.47	0.50	0.54	0.59	0.65	0.69	0.72	0.74	0.77	0.78	0.81	0.87	0.87	0.90	0.93	0.96	0.98	1.00	1.02	1.04	1.06	1.07	1.09	1.11	1.14
1995	0.30	0.41	0.43	0.46	0.49	0.53	0.58	0.64	0.68	0.70	0.73	0.75	0.77	0.79	0.85	0.85	0.88	0.91	0.94	0.96	0.98	1.00	1.02	1.04	1.05	1.07	1.09	1.11
1996	0.29	0.40	0.42	0.45	0.48	0.52	0.57	0.62	0.66	0.69	0.71	0.74	0.75	0.78	0.83	0.83	0.87	0.90	0.92	0.94	0.96	0.98	1.00	1.02	1.03	1.05	1.07	1.09
1997	0.28	0.39	0.42	0.44	0.47	0.51	0.56	0.61	0.65	0.68	0.70	0.72	0.74	0.76	0.82	0.82	0.85	0.88	0.90	0.92	0.94	0.96	0.98	1.00	1.01	1.03	1.05	1.07
1998	0.28	0.39	0.41	0.44	0.47	0.51	0.55	0.60	0.64	0.67	0.69	0.71	0.73	0.75	0.81	0.81	0.84	0.87	0.89	0.91	0.93	0.95	0.97	0.99	1.00	1.01	1.04	1.06
1999	0.28	0.38	0.40	0.43	0.46	0.50	0.55	0.60	0.63	0.66	0.68	0.70	0.72	0.74	0.80	0.80	0.83	0.86	0.88	0.90	0.92	0.94	0.96	0.97	0.99	1.00	1.02	1.04
2000	0.27	0.37	0.40	0.42	0.45	0.49	0.53	0.58	0.62	0.64	0.67	0.69	0.70	0.73	0.78	0.78	0.81	0.84	0.86	0.88	0.90	0.92	0.93	0.95	0.96	0.98	1.00	1.02
2001	0.27	0.37	0.39	0.41	0.44	0.48	0.52	0.57	0.61	0.63	0.65	0.67	0.69	0.71	0.76	0.76	0.79	0.82	0.84	0.86	0.88	0.90	0.91	0.93	0.94	0.96	0.98	1.00

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Source:

U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Washington, DC, monthly.