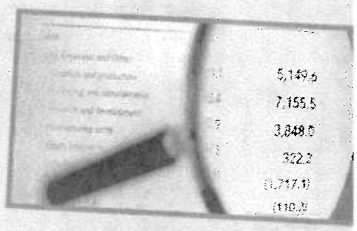
# Appendix I



*Please visit our Internet site (**www.mhhe.com/revsine4e**) for a spreadsheet template that can be used to find present value factors for interest rates not shown in this appendix.*

## TABLE I Present Value of $1

$$P = \frac{1}{(1+r)^n} = (1+r)^{-n}$$

| (n) Periods | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 15% | 16% | 17% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.98039 | 0.97087 | 0.96154 | 0.95238 | 0.94340 | 0.93458 | 0.92593 | 0.91743 | 0.90909 | 0.90090 | 0.89286 | 0.86957 | 0.86207 | 0.85470 |
| 2 | 0.96117 | 0.94260 | 0.92456 | 0.90703 | 0.89000 | 0.87344 | 0.85734 | 0.84168 | 0.82645 | 0.81162 | 0.79719 | 0.75614 | 0.74316 | 0.73051 |
| 3 | 0.94232 | 0.91514 | 0.88900 | 0.86384 | 0.83962 | 0.81630 | 0.79383 | 0.77218 | 0.75132 | 0.73119 | 0.71178 | 0.65752 | 0.64066 | 0.62437 |
| 4 | 0.92385 | 0.88849 | 0.85480 | 0.82270 | 0.79209 | 0.76290 | 0.73503 | 0.70843 | 0.68301 | 0.65873 | 0.63552 | 0.57175 | 0.55229 | 0.53365 |
| 5 | 0.90573 | 0.86261 | 0.82193 | 0.78353 | 0.74726 | 0.71299 | 0.68058 | 0.64993 | 0.62092 | 0.59345 | 0.56743 | 0.49718 | 0.47611 | 0.45611 |
| 6 | 0.88797 | 0.83748 | 0.79031 | 0.74622 | 0.70496 | 0.66634 | 0.63017 | 0.59627 | 0.56447 | 0.53464 | 0.50663 | 0.43233 | 0.41044 | 0.38984 |
| 7 | 0.87056 | 0.81309 | 0.75992 | 0.71068 | 0.66506 | 0.62275 | 0.58349 | 0.54703 | 0.51316 | 0.48166 | 0.45235 | 0.37594 | 0.35383 | 0.33320 |
| 8 | 0.85349 | 0.78941 | 0.73069 | 0.67684 | 0.62741 | 0.58201 | 0.54027 | 0.50187 | 0.46651 | 0.43393 | 0.40388 | 0.32690 | 0.30503 | 0.28478 |
| 9 | 0.83676 | 0.76642 | 0.70259 | 0.64461 | 0.59190 | 0.54393 | 0.50025 | 0.46043 | 0.42410 | 0.39092 | 0.36061 | 0.28426 | 0.26295 | 0.24340 |
| 10 | 0.82035 | 0.74409 | 0.67556 | 0.61391 | 0.55839 | 0.50835 | 0.46319 | 0.42241 | 0.38554 | 0.35218 | 0.32197 | 0.24718 | 0.22668 | 0.20804 |
| 11 | 0.80426 | 0.72242 | 0.64958 | 0.58468 | 0.52679 | 0.47509 | 0.42888 | 0.38753 | 0.35049 | 0.31728 | 0.28748 | 0.21494 | 0.19542 | 0.17781 |
| 12 | 0.78849 | 0.70138 | 0.62460 | 0.55684 | 0.49697 | 0.44401 | 0.39711 | 0.35553 | 0.31863 | 0.28584 | 0.25668 | 0.18691 | 0.16846 | 0.15197 |
| 13 | 0.77303 | 0.68095 | 0.60057 | 0.53032 | 0.46884 | 0.41496 | 0.36770 | 0.32618 | 0.28966 | 0.25751 | 0.22917 | 0.16253 | 0.14523 | 0.12989 |
| 14 | 0.75788 | 0.66112 | 0.57748 | 0.50507 | 0.44230 | 0.38782 | 0.34046 | 0.29925 | 0.26333 | 0.23199 | 0.20462 | 0.14133 | 0.12520 | 0.11102 |
| 15 | 0.74301 | 0.64186 | 0.55526 | 0.48102 | 0.41727 | 0.36245 | 0.31524 | 0.27454 | 0.23939 | 0.20900 | 0.18270 | 0.12289 | 0.10793 | 0.09489 |
| 16 | 0.72845 | 0.62317 | 0.53391 | 0.45811 | 0.39365 | 0.33873 | 0.29189 | 0.25187 | 0.21763 | 0.18829 | 0.16312 | 0.10686 | 0.09304 | 0.08110 |
| 17 | 0.71416 | 0.60502 | 0.51337 | 0.43630 | 0.37136 | 0.31657 | 0.27027 | 0.23107 | 0.19784 | 0.16963 | 0.14564 | 0.09293 | 0.08021 | 0.06932 |
| 18 | 0.70016 | 0.58739 | 0.49363 | 0.41552 | 0.35034 | 0.29586 | 0.25025 | 0.21199 | 0.17986 | 0.15282 | 0.13004 | 0.08081 | 0.06914 | 0.05925 |
| 19 | 0.68643 | 0.57029 | 0.47464 | 0.39573 | 0.33051 | 0.27651 | 0.23171 | 0.19449 | 0.16351 | 0.13768 | 0.11611 | 0.07027 | 0.05961 | 0.05064 |
| 20 | 0.67297 | 0.55368 | 0.45639 | 0.37689 | 0.31180 | 0.25842 | 0.21455 | 0.17843 | 0.14864 | 0.12403 | 0.10367 | 0.06110 | 0.05139 | 0.04328 |
| 25 | 0.60953 | 0.47761 | 0.37512 | 0.29530 | 0.23300 | 0.18425 | 0.14602 | 0.11597 | 0.09230 | 0.07361 | 0.05882 | 0.03038 | 0.02447 | 0.01974 |
| 30 | 0.55207 | 0.41199 | 0.30832 | 0.23138 | 0.17411 | 0.13137 | 0.09938 | 0.07537 | 0.05731 | 0.04368 | 0.03338 | 0.01510 | 0.01165 | 0.00900 |
| 35 | 0.50003 | 0.35538 | 0.25342 | 0.18129 | 0.13011 | 0.09366 | 0.06763 | 0.04899 | 0.03558 | 0.02592 | 0.01894 | 0.00751 | 0.00555 | 0.00411 |
| 40 | 0.45289 | 0.30656 | 0.20829 | 0.14205 | 0.09722 | 0.06678 | 0.04603 | 0.03184 | 0.02209 | 0.01538 | 0.01075 | 0.00373 | 0.00264 | 0.00187 |

## TABLE 2 Present Value of an Ordinary Annuity of $1

$$P_{OA}\,5\,\left(1-\frac{1}{(1+r)^n}\right)/r$$

| (n) Periods | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 15% | 16% | 17% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.98039 | 0.97087 | 0.96154 | 0.95238 | 0.94340 | 0.93458 | 0.92593 | 0.91743 | 0.90909 | 0.90090 | 0.89286 | 0.86957 | 0.86207 | 0.85470 |
| 2 | 1.94156 | 1.91347 | 1.88609 | 1.85941 | 1.83339 | 1.80802 | 1.78326 | 1.75911 | 1.73554 | 1.71252 | 1.69005 | 1.62571 | 1.60523 | 1.58521 |
| 3 | 2.88388 | 2.82861 | 2.77509 | 2.72325 | 2.67301 | 2.62432 | 2.57710 | 2.53129 | 2.48685 | 2.44371 | 2.40183 | 2.28323 | 2.24589 | 2.20958 |
| 4 | 3.80773 | 3.71710 | 3.62990 | 3.54595 | 3.46511 | 3.38721 | 3.31213 | 3.23972 | 3.16987 | 3.10245 | 3.03735 | 2.85498 | 2.79818 | 2.74324 |
| 5 | 4.71346 | 4.57971 | 4.45182 | 4.32948 | 4.21236 | 4.10020 | 3.99271 | 3.88965 | 3.79079 | 3.69590 | 3.60478 | 3.35216 | 3.27429 | 3.19935 |
| 6 | 5.60143 | 5.41719 | 5.24214 | 5.07569 | 4.91732 | 4.76654 | 4.62288 | 4.48592 | 4.35526 | 4.23054 | 4.11141 | 3.78448 | 3.68474 | 3.58918 |
| 7 | 6.47199 | 6.23028 | 6.00205 | 5.78637 | 5.58238 | 5.38929 | 5.20637 | 5.03295 | 4.86842 | 4.71220 | 4.56376 | 4.16042 | 4.03857 | 3.92238 |
| 8 | 7.32548 | 7.01969 | 6.73274 | 6.46321 | 6.20979 | 5.97130 | 5.74664 | 5.53482 | 5.33493 | 5.14612 | 4.96764 | 4.48732 | 4.34359 | 4.20716 |
| 9 | 8.16224 | 7.78611 | 7.43533 | 7.10782 | 6.80169 | 6.51523 | 6.24689 | 5.99525 | 5.75902 | 5.53705 | 5.32825 | 4.77158 | 4.60654 | 4.45057 |
| 10 | 8.98259 | 8.53020 | 8.11090 | 7.72173 | 7.36009 | 7.02358 | 6.71008 | 6.41766 | 6.14457 | 5.88923 | 5.65022 | 5.01877 | 4.83323 | 4.65860 |
| 11 | 9.78685 | 9.25262 | 8.76048 | 8.30641 | 7.88687 | 7.49867 | 7.13896 | 6.80519 | 6.49506 | 6.20652 | 5.93770 | 5.23371 | 5.02864 | 4.83641 |
| 12 | 10.57534 | 9.95400 | 9.38507 | 8.86325 | 8.38384 | 7.94269 | 7.53608 | 7.16073 | 6.81369 | 6.49236 | 6.19437 | 5.42062 | 5.19711 | 4.98839 |
| 13 | 11.34837 | 10.63496 | 9.98565 | 9.39357 | 8.85268 | 8.35765 | 7.90378 | 7.48690 | 7.10336 | 6.74987 | 6.42355 | 5.58315 | 5.34233 | 5.11828 |
| 14 | 12.10625 | 11.29607 | 10.56312 | 9.89864 | 9.29498 | 8.74547 | 8.24424 | 7.78615 | 7.36669 | 6.98187 | 6.62817 | 5.72448 | 5.46753 | 5.22930 |
| 15 | 12.84926 | 11.93794 | 11.11839 | 10.37966 | 9.71225 | 9.10791 | 8.55948 | 8.06069 | 7.60608 | 7.19087 | 6.81086 | 5.84737 | 5.57546 | 5.32419 |
| 16 | 13.57771 | 12.56110 | 11.65230 | 10.83777 | 10.10590 | 9.44665 | 8.85137 | 8.31256 | 7.82371 | 7.37916 | 6.97399 | 5.95423 | 5.66850 | 5.40529 |
| 17 | 14.29187 | 13.16612 | 12.16567 | 11.27407 | 10.47726 | 9.76322 | 9.12164 | 8.54363 | 8.02155 | 7.54879 | 7.11963 | 6.04716 | 5.74870 | 5.47461 |
| 18 | 14.99203 | 13.75351 | 12.65930 | 11.68959 | 10.82760 | 10.05909 | 9.37189 | 8.75563 | 8.20141 | 7.70162 | 7.24967 | 6.12797 | 5.81785 | 5.53385 |
| 19 | 15.67846 | 14.32380 | 13.13394 | 12.08532 | 11.15812 | 10.33560 | 9.60360 | 8.95011 | 8.36492 | 7.83929 | 7.36578 | 6.19823 | 5.87746 | 5.58449 |
| 20 | 16.35143 | 14.87747 | 13.59033 | 12.46221 | 11.46992 | 10.59401 | 9.81815 | 9.12855 | 8.51356 | 7.96333 | 7.46944 | 6.25933 | 5.92884 | 5.62777 |
| 25 | 19.52346 | 17.41315 | 15.62208 | 14.09394 | 12.78336 | 11.65358 | 10.67478 | 9.82258 | 9.07704 | 8.42174 | 7.84314 | 6.46415 | 6.09709 | 5.76623 |
| 30 | 22.39646 | 19.60044 | 17.29203 | 15.37245 | 13.76483 | 12.40904 | 11.25778 | 10.27365 | 9.42691 | 8.69379 | 8.05518 | 6.56598 | 6.17720 | 5.82939 |
| 35 | 24.99862 | 21.48722 | 18.66461 | 16.37419 | 14.49825 | 12.94767 | 11.65457 | 10.56682 | 9.64416 | 8.85524 | 8.17550 | 6.61661 | 6.21534 | 5.85820 |
| 40 | 27.35548 | 23.11477 | 19.79277 | 17.15909 | 15.04630 | 13.33171 | 11.92461 | 10.75736 | 9.77905 | 8.95105 | 8.24378 | 6.64178 | 6.23350 | 5.87133 |

## TABLE 3 Present Value of an Annuity Due of $1

$$P_{AD} = 1 + \left(1 - \frac{1}{(1+r)^{n-1}}\right)/r$$

| (n) Periods | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 15% | 16% | 17% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 | 1.00000 |
| 2 | 1.98039 | 1.97087 | 1.96154 | 1.95238 | 1.94340 | 1.93458 | 1.92593 | 1.91743 | 1.90909 | 1.90090 | 1.89286 | 1.86957 | 1.86207 | 1.85470 |
| 3 | 2.94156 | 2.91347 | 2.88609 | 2.85941 | 2.83339 | 2.80802 | 2.78326 | 2.75911 | 2.73554 | 2.71252 | 2.69005 | 2.62571 | 2.60523 | 2.58521 |
| 4 | 3.88388 | 3.82861 | 3.77509 | 3.72325 | 3.67301 | 3.62432 | 3.57710 | 3.53129 | 3.48685 | 3.44371 | 3.40183 | 3.28323 | 3.24589 | 3.20958 |
| 5 | 4.80773 | 4.71710 | 4.62990 | 4.54595 | 4.46511 | 4.38721 | 4.31213 | 4.23972 | 4.16987 | 4.10245 | 4.03735 | 3.85498 | 3.79818 | 3.74324 |
| 6 | 5.71346 | 5.57971 | 5.45182 | 5.32948 | 5.21236 | 5.10020 | 4.99271 | 4.88965 | 4.79079 | 4.69590 | 4.60478 | 4.35216 | 4.27429 | 4.19935 |
| 7 | 6.60143 | 6.41719 | 6.24214 | 6.07569 | 5.91732 | 5.76654 | 5.62288 | 5.48592 | 5.35526 | 5.23054 | 5.11141 | 4.78448 | 4.68474 | 4.58918 |
| 8 | 7.47199 | 7.23028 | 7.00205 | 6.78637 | 6.58238 | 6.38929 | 6.20637 | 6.03295 | 5.86842 | 5.71220 | 5.56376 | 5.16042 | 5.03857 | 4.92238 |
| 9 | 8.32548 | 8.01969 | 7.73274 | 7.46321 | 7.20979 | 6.97130 | 6.74664 | 6.53482 | 6.33493 | 6.14612 | 5.96764 | 5.48732 | 5.34359 | 5.20716 |
| 10 | 9.16224 | 8.78611 | 8.43533 | 8.10782 | 7.80169 | 7.51523 | 7.24689 | 6.99525 | 6.75902 | 6.53705 | 6.32825 | 5.77158 | 5.60654 | 5.45057 |
| 11 | 9.98259 | 9.53020 | 9.11090 | 8.72173 | 8.36009 | 8.02358 | 7.71008 | 7.41766 | 7.14457 | 6.88923 | 6.65022 | 6.01877 | 5.83323 | 5.65860 |
| 12 | 10.78685 | 10.25262 | 9.76048 | 9.30641 | 8.88687 | 8.49867 | 8.13896 | 7.80519 | 7.49506 | 7.20652 | 6.93770 | 6.23371 | 6.02864 | 5.83641 |
| 13 | 11.57534 | 10.95400 | 10.38507 | 9.86325 | 9.38384 | 8.94269 | 8.53608 | 8.16073 | 7.81369 | 7.49236 | 7.19437 | 6.42062 | 6.19711 | 5.98839 |
| 14 | 12.34837 | 11.63496 | 10.98565 | 10.39357 | 9.85268 | 9.35765 | 8.90378 | 8.48690 | 8.10336 | 7.74987 | 7.42355 | 6.58315 | 6.34233 | 6.11828 |
| 15 | 13.10625 | 12.29607 | 11.56312 | 10.89864 | 10.29498 | 9.74547 | 9.24424 | 8.78615 | 8.36669 | 7.98187 | 7.62817 | 6.72448 | 6.46753 | 6.22930 |
| 16 | 13.84926 | 12.93794 | 12.11839 | 11.37966 | 10.71225 | 10.10791 | 9.55948 | 9.06069 | 8.60608 | 8.19087 | 7.81086 | 6.84737 | 6.57546 | 6.32419 |
| 17 | 14.57771 | 13.56110 | 12.65230 | 11.83777 | 11.10590 | 10.44665 | 9.85137 | 9.31256 | 8.82371 | 8.37916 | 7.97399 | 6.95423 | 6.66850 | 6.40529 |
| 18 | 15.29187 | 14.16612 | 13.16567 | 12.27407 | 11.47726 | 10.76322 | 10.12164 | 9.54363 | 9.02155 | 8.54879 | 8.11963 | 7.04716 | 6.74870 | 6.47461 |
| 19 | 15.99203 | 14.75351 | 13.65930 | 12.68959 | 11.82760 | 11.05909 | 10.37189 | 9.75563 | 9.20141 | 8.70162 | 8.24967 | 7.12797 | 6.81785 | 6.53385 |
| 20 | 16.67846 | 15.32380 | 14.13394 | 13.08532 | 12.15812 | 11.33560 | 10.60360 | 9.95011 | 9.36492 | 8.83929 | 8.36578 | 7.19823 | 6.87746 | 6.58449 |
| 25 | 19.91393 | 17.93554 | 16.24696 | 14.79864 | 13.55036 | 12.46933 | 11.52876 | 10.70661 | 9.98474 | 9.34814 | 8.78432 | 7.43377 | 7.07263 | 6.74649 |
| 30 | 22.84438 | 20.18845 | 17.98371 | 16.14107 | 14.59072 | 13.27767 | 12.15841 | 11.19828 | 10.36961 | 9.65011 | 9.02181 | 7.55088 | 7.16555 | 6.82039 |
| 35 | 25.49859 | 22.13184 | 19.41120 | 17.19290 | 15.36814 | 13.85401 | 12.58693 | 11.51784 | 10.60857 | 9.82932 | 9.15656 | 7.60910 | 7.20979 | 6.85409 |
| 40 | 27.90259 | 23.80822 | 20.58448 | 18.01704 | 15.94907 | 14.26493 | 12.87858 | 11.72552 | 10.75696 | 9.93567 | 9.23303 | 7.63805 | 7.23086 | 6.86946 |