Appendix H

Normal Probabilities

The table on the following pages of this appendix give the areas or probabilities associated with the normal distribution. These are presented here as areas under the standardized normal probability distribution. The standardized normal variable Z has a mean $\mu = 0$ and a standard deviation of $\sigma = 1$. Thus the Z values represent the number of standard deviations from the mean.

In the table, the Z column gives distances along the horizontal axis. These are distances from the centre, negative to the left of centre, and positive to the right of centre. The table gives areas to the right of centre. For each Z the area to the right of centre is the same as the respective area to the left of centre.

The A column gives the area under this distribution between the centre and each Z. The B column gives the area under the curve that lies to the right of each Z. Note that the A and B column always add to 0.5000 for each Z because one half of the area under the curve lies to the right of centre, and the other half to the left of centre. Figure H.1 gives these areas, and the following paragraphs give some examples of how to use this figure.

Using the Normal Table. Area A pictured in Figure H.1 is the area between $Z = 0$ and a Z of approximately 1.3. This size of this shaded area is obtained by going down the Z column until $Z = 1.30$ is reached. This is on the second page of the table, near the bottom of the first column. There area A is seen to be 0.4032. In addition, area B can also be determined as 0.0968. Thus a proportion 0.4032 of the area under the normal curve lies between the centre, or the mean, and $Z = 1.3$. To the right of $Z = 1.3$, there is only 0.0968 of the area under the normal curve. That is, just

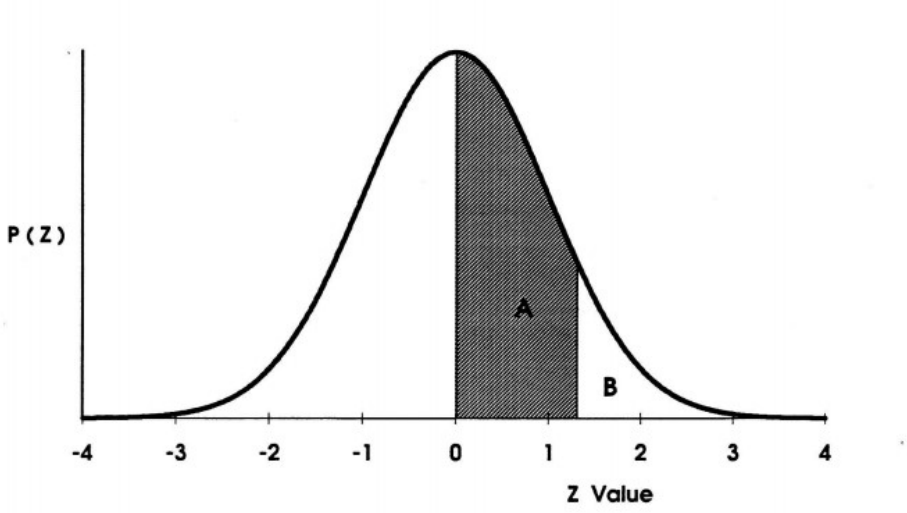

Figure H.1: Standardized Normal Probability Distribution

under one tenth of the area under the normal curve lies above 1.3 standard deviations to the right of centre. Note that the sum of areas A and B is $0.4032 + 0.0968 = 0.5000$, since one half of the area lies to the right of centre.

Z values to the left of centre will be negative. Suppose the area between the centre and $Z = -2$ is to be determined. This is the same as the area between the centre and $Z = 2$, that is 0.4772 (Area A at the top left of the third page of the table). The area to the left of $Z = -2$ is the area in column B for $Z = 2$, that is 0.0227.