Binomial option

If you specify the BINOMIAL option in the TABLES statement, PROC FREQ computes the proportion for one-way tables. You can use the LEVEL= option to specify a different level for the proportion.

Equality Test

BINOMIAL option computes a large-sample test of $H_0 : p = p_0$, where you can specify the value of p_0 with the P= binomial-option. If you do not specify a null value with P=, PROC FREQ uses a default value $p_0 = 0.5$.

By default, VAR=NULL binomial-option is set. The standard error is based on the null hypothesis $p = p_0$. The test statistic is computed as

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1 - p_0)}{n}}}$$

If you specify the VAR=SAMPLE binomial-option, the standard error is computed from the sample proportion. The test statistic becomes

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{\hat{p}(1 - \hat{p})}{n}}}$$

Confidence Limits

No matter VAR=NULL or VAR=SAMPLE is specified, the BINOMIAL option computes the confidence limits for the proportion as

$$\hat{p} \pm z_{\alpha/2} \cdot \sqrt{\frac{\hat{p}(1 - \hat{p})}{n}}$$

Risks and Risk Differences

The RISKDIFF option in the TABLES statement provides estimates of risks (or binomial proportions) and risk differences for 2X2 tables.

Equality Test

If you specify the EQUAL riskdiff-option, PROC FREQ computes a test of equality, or a test of the null hypothesis that the proportion difference equals zero, that is,

$$H_0 : d = 0 \text{ versus the alternative } H_a : d \neq 0$$

By default, VAR=SAMPLE riskdiff-option is set. The test statistic is computed as

$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}}$$

If you specify the VAR=NULL riskdiff- option, the standard error is based on the null hypothesis that the row 1 and row 2 proportions are equal. The test statistic is

$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}_p(1-\hat{p}_p)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

where $\hat{p}_p$ estimates the "pooled" overall column 1 proportion.

$$\hat{p}_p = \frac{Y_1 + Y_2}{n_1 + n_2}.$$

Confidence Limits

No matter VAR=NULL or VAR=SAMPLE is specified, the RISKDIFF option computes the confidence limits for the proportion difference as

$$\hat{p}_1 - \hat{p}_2 \pm z_{\alpha/2} \cdot \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$