The purpose of this paper is threefold: First, a procedure for obtaining unbiased and consistent estimates of the variance of the disturbance term (step variance) in the market risk of individual stocks and portfolios is presented under the random walk and autoregressive hypothesis for the market risk. These estimates can be used to test the null hypothesis that the market risk of a given stock over a given time series is stationary against the above mentioned alternative hypothesis about the nature of nonstationarity in the market risk of stock. Second, under the assumption that the market risk follows a random walk, estimates of step variance of the market risk of the stocks listed on the New York Stock Exchange are presented. The null hypothesis of stationary risk is tested against the random walk hypothesis for each stock over the period 1926-1975 and its subintervals. In the third part, the effect of portfolio diversification on nonstationarity of the market risk of portfolios is examined.