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The aim of this paper is to identify a set of early warning indicators that effectively discriminate between firms that are more prone to default on their financial obligations from those that are less prone to do so. To fulfill this objective, we use the Discriminant Analysis methodology. We find that the strongest predictors that a Colombian real sector firm will fail to meet their financial obligations are: debt ratio and the number of banking relationships. We also use a Logit model to estimate the debtors probability of default (PD) and its distribution. The PD distribution has a positive skew and leptokurtic, suggesting a low overall PD. When performing a stress test (i.e. when a negative shock is applied to the firms' performance), we find that the PD distribution shifts to the right causing an increase in loan loss provisions and a decrease in net profits.