a unique technique that is the feed-forward artificial neural network with back-propagation algorithm. It will show the ability of this model to predict insolvency of a firm and to simulate credit ratings. On the computation side, an algorithm for calculating an optimal threshold that separates good firms from bad ones is illustrated. Moreover, a three-layer neural network framework for the rating simulation is explained.

1. RESEARCH GOAL

In this study three subjects are considered. The first two have a computational soul and the third one represents an application of model to rating assessment problem.

The inspiring idea was born from the evidence that in Italy the majority of firms have micro or small size and laws do not require them to present completed balance-sheets. It became very difficult to assess these firms from the only information collected in these poor documents and also big analyst companies, as Bureau van Dijk (BvD), were not able to judge a lot of them. Ceris-CNR institute analyses the economic and financial situation of Piedmont firms applying descriptive statistics but the data lack can often produce distorted images of reality or weak considerations.

On a wake of these remarks in the first presented model we discuss the artificial neural network validity in forecasting default probability of firms and its classification power in the situation of weak disposability of balance-sheet data.

A second more complex framework will be shown for proving that it is possible to simulate rating judgements also with scarce data. Indeed Ceris-CNR buy from Bureau van Dijk rating judgements but for the above mentioned reason not all firms have their rating scores.

A third result shows a model customization built for improving outcomes just obtained from the previous framework.

1.1. Models and data

As explained in the previous section Italian laws do not require that all firms compile detailed balance-sheets. This depends on the nature of society and then, substantially, on the size of firms.

Rating agencies and analyser societies even have not disposability of data outside of balance-sheets for assessing financial and economic performances of firms.

AIDA[3] database has been the source of our Italian data and according to the mainstream analysis of Ceris-CNR and

[3] AIDA is a database edited by Bureau van Dijk that contains comprehensive information on listed companies in Italy, with up to five years of history. Provided information are about accessible accounts following the scheme of the 4th Directive CEE, probabilities of default and rating assessments, over to provide information about identification number, address and trade description of collected firms.