# Proposal for the SFB 649's Guest Researcher Program

Name: Shiyi Chen

Affiliation: China Center for Economic Study (CCES), Fudan University, China

Title of the Proposed Research: Predicting German companies' financial default based on Support Vector Machine (SVM)

I would like to apply for the Guest Researcher Program for Young Researchers of the SFB 649. My visiting period would be from July 15 to August 31, 2006.

If accepted, I plan to undertake research on the topic of predicting German companies' financial default probability based on Support Vector Machine (SVM) during this visiting period with co-working with Prof. Haerdle and other faculties of the SFB 649. I understand that the research results will be published as a discussion papers series at SFB 649 and that all algorithms developed during the research will be open to SFB 649. I am also glad to participate in other ongoing project of SFB 649 such as Project C2 led by Dr. Ralf Brüggemann and Dr. Carsten Trenkler.

Companies' data are hardly obtained in China. Joining this research program of SFB 649 will make me have an opportunity to utilize company data, particularly Credit Reform Data, and other resources provided by the SFB 649's Financial and Economic Data Center.

The SVM, a key methodology of my proposed research, is a novel and computationally powerful estimation principle developed by Vapnik (1997). The main advantage of SVM is its ability to minimize structural risk as opposed to empirical risk usually employed by conventional estimation methods. It is this framework design that endows SVM with best generalization ability in out-of-sample forecasting.

Using the SVM approach, I would like to develop a model predicting companies financial default and apply the developed model to the Credit Reform Data. Once a model being developed, companies can be rated using the default probability estimated by the model and the suitably chosen thresholds for ratings. The number of thresholds and thresholds themselves could be selected via maximizing the objective function of the SVM. Also I plan to develop such models for each type of business rather than just one model for all companies.