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ENTREPRENEURIAL FIRMS AND SIGNALING FOR CREDITWORTHINESS: A BAYESIAN MODELING APPROACH (SUMMARY)

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SUMMARY

ENTREPRENEURIAL FIRMS AND SIGNALING FOR CREDITWORTHINESS: A BAYESIAN MODELING APPROACH

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Principal Topic

To fulfill their growth aspirations, entrepreneurial ventures depend on short-term, liquid sources of debt financing such as bank loans. However, because of information asymmetry, in lending money to firms banks must deal with the possibility of adverse selection. As such, banks rely on well-established third-party credit scores such as the Dun and Bradstreet’s (D&B) Paydex score, which is a measure of the venture’s creditworthiness based on its ability to pay bills, to decide whether to lend credit. Using conceptual arguments grounded in venture financing literature and signaling theory, we develop a theoretical model of factors likely to influence the Paydex score. Further, we incorporate in the model multi-level features, by considering co-variates operating at firm and industry levels. Ours is probably the first study to examine creditworthiness of entrepreneurial firms based on prior track-record of external financing received and volatilities associated with firm sales and employee strength.

Method

We use an extensive dataset of US based high-growth entrepreneurial firms available through the Lowe Foundation. The Paydex score in the dataset exhibits non-standard behavior: it exhibits heavy skew-ness to the left which makes classical least squares regression methods infeasible to adopt. Therefore, in modeling and estimating Paydex scores, we make use of Bayesian regression type models with beta distributed error terms. In estimating the model parameters, we make use of Markov chain Monte Carlo techniques such as the Metropolis-Hastings algorithm in conjunction with the Gibbs sampler. In doing so, we will use common measures of convergence such as the shrink factors to assess the adequacy of the proposed estimation techniques. Furthermore, to assess model fit/adequacy, we use the harmonic mean estimator of the marginal likelihood that is commonly computed for models with Markov chain Monte Carlo steps.

Results and Implications

Our preliminary results indicate that the volatility in the employment of an entrepreneurial venture affects its financial status in a negative manner, whereas the volatility in sales has no effect on it. In addition, getting external funding in the last three years of its existence has a positive effect on its current position. Other exploratory results indicate that the industry that the firm operates in plays an important role in determining the financial health of a firm. Such a finding leads us to further explore the existence of random effects in our model as part of our multi-level approach.

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