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Project financing, entrepreneurial activity, and investment in the presence of asymmetric information

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ABSTRACT

We analyze a two-period signaling model in which a representative entrepreneur in a regional economy has a project that generates a random cash flow and that requires investment that the entrepreneur raises from a competitive market. The project's type is known to the entrepreneur but not to the investors. Further, the entrepreneur is restricted to issuing debt only or equity only. We first show that there is no separating perfect Bayesian equilibrium (PBE) contract involving the issuance of equity only, that there exists a pooling PBE contract involving the issuance of equity only, and that a debt contract is preferred to an equity contract by our entrepreneur. Next, we suppose that the entrepreneur incurs a non-pecuniary cost of financial distress $F > 0$ whenever he is unable to make a repayment at time $t = 1$. We provide conditions on F under which a pooling PBE contract with debt exists and a separating PBE contract with debt and equity exists. Finally, we examine whether a high type entrepreneur will prefer a setting with a cost of financial distress ($F > 0$) or a setting in which there is no such cost ($F = 0$).

1. Introduction

The subject of entrepreneurship and its effects on the welfare of regions has now attracted the attention of several researchers in economics and in regional science. In this regard, Fischer and Nijkamp (2009, p. 183) have observed that there is "much policy interest in how to favor entrepreneurship in the regional economy." The substantial literature on entrepreneurship in the context of regional

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development[1] has emphasized three key points. First, entrepreneurship involves an *active process* in which new firms are established, existing firms are maturing, and unsuccessful firms are concluding their operations. Second, entrepreneurship is all about the *control* of this active process by the entrepreneur/owner. Third, entrepreneurship typically has something to do with innovation of one sort or another in a *stochastic* setting. In the words of Fischer and Nijkamp (2009, p. 185), these three points jointly tell us that entrepreneurs are "economic change actors in an uncertain and risky business environment."

In addition to emphasizing the three points noted in the preceding paragraph, the literature on entrepreneurship has addressed a number of other issues. McCormick and Wahba (2001) have used an econometric model of entrepreneurial activity in Egypt to note that overseas savings and the duration of stay overseas both affirmatively impact the likelihood of entrepreneurship among literate returnees. Using an intertemporal model, Buera (2009) has demonstrated that the likelihood of becoming an entrepreneur as a function of wealth is increasing (decreasing) for low (high) levels of wealth. Acs, Braunerhjelm, Audretsch, & Carlsson (2009) have developed a "knowledge spillover theory of entrepreneurship" and have contended that knowledge created endogenously results in spillovers and that these spillovers permit entrepreneurs to identify and exploit opportunities. Batabyal and Nijkamp (2010) have studied contracting between entrepreneurs and venture capitalists in an open regional economy and have shown that in the presence of asymmetric information, entrepreneurial investment is suboptimal because venture capitalists do not offer entrepreneurs the first best investment contract. Focusing on the Euro area, Gelain (2010) has attempted to obtain a time series for the unobserved risk premium of entrepreneur loans. Kikuchi and Long (2010) use a model of service offshoring to study the role that entrepreneurs play in deciding how to produce business services. Batabyal and Beladi (2011) have used a two-period model of an open regional economy to analyze the interaction between entrepreneurs and venture capitalists when the regional government must pay off a per capita debt which it finances by taxing successful second period entrepreneurs.

Coming to the financing of entrepreneurial projects, Zook (2002) notes that the regional distribution of venture capital financing plays a key role in determining the location of new internet startups. Focusing on rural development, Drabenstott, Novack, and Abraham (2003) observe that even though it is well known that rural entrepreneurs lack sufficient equity capital, there is still no consensus on which policies can effectively deal with this problem. Li, Meng, Wang, and Zhou (2008) concentrate on private firms in China and contend that membership in the Communist party is a key determinant of the ability of entrepreneurs to obtain financing from banks and other state institutions. Mas-Verdu, Baviera-Puig, and Martinez-Gomez (2009) study which aspects of an entrepreneur and his project are most pertinent for the receipt of public funds in the Spanish region of Valencia. Finally, Harrison, Mason, and Robson (2010) contend that an entrepreneur's ability to obtain financing from the "business angel market" in the UK is determined largely by this individual's ability to tap into localized and personal networks, the extent to which "hands-on" involvement is important to a potential investor, and the desire to minimize risk.

Our understanding of many aspects of entrepreneurship and project financing in regional economies has been enhanced by the papers discussed in the previous two paragraphs. Even so, there are virtually *no* studies in regional science that analyze *contracting* in a *dynamic* setting between entrepreneurs with projects who seek *financing* and investors who are interested in providing this financing but who are also uncertain about the quality of the projects for which financing is sought. Consistent with this observation, Fischer and Nijkamp (2009, p. 191) have noted that the "complexity of the determinants and implications of entrepreneurial behavior in space and time calls for sophisticated modeling efforts..."

Given this state of affairs, in our paper, we analyze a two-period signaling model[2] in which a representative entrepreneur in a regional economy has a project that generates a random cash flow and that

[1] See Audretsch (2004), Audretsch and Aldridge (2009), Batabyal and Nijkamp (2010), Fischer and Nijkamp (2009), Fischer, Scherngell, and Jansenberger (2006) and Malecki (1997) for more on this literature.

[2] See Fudenberg and Tirole (1991, pp. 324–331) and particularly Bolton and Dewatripont (2005, pp. 99–127) for textbook accounts of signaling models in the presence of hidden information. Also see Campbell, Cohen, Ederer, and Spinnewijn (2007, pp. 18–21) and Myers and Majluf (1984) for the analysis of a similar problem and for a prominent analysis of related issues.