



Influence of intellectual property, foreign investment, and technological adoption on technology entrepreneurship[☆]

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ABSTRACT

Using a multi-level modeling approach, the present study empirically examines how intellectual property rights, inflow of foreign direct investment and barriers to technological adoption affect the likelihood of individuals' entry into technology entrepreneurship in a sample of 20 emerging economies. The results suggest that regimes with strong intellectual property rights protection combined with high levels of foreign direct investment per capita decrease the likelihood of individuals' entry into technology entrepreneurship, whereas low barriers to technological adoption increase this likelihood. These findings contribute to understanding the influence that national institutions and foreign investment exercise on the entrepreneurial behavior of early-stage technology entrepreneurs in emerging economies, for which the extant literature shows mixed results.

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1. Introduction

The present study examines the influence of national level institutions and foreign direct investment on the propensity of individuals to enter into careers in technology entrepreneurship in emerging economies. This study contributes to the literature since the scope of its approach differs from the bulk of existing research, which does not theorize across levels of analysis (Hayton, George, & Zahra, 2002; Jack & Anderson, 2002; Thornton, 1999), tends to assume mature market conditions (Reynolds et al., 2005), and attempts to predict entry into generalized entrepreneurship rather than specialized forms such as techno-entrepreneurship (Phan, 2004; Shane & Venkataraman, 2000; Xia & Tang, 2011). These limitations of previous research leave an important gap that the present study seeks to fill.

First, the policy-oriented literature must recognize the importance of contextual influences on entrepreneurship in order to avoid inappropriate policy transfer (Busenitz et al., 2003). For instance, policies that stimulate economic growth in developed countries may fail to do so in emerging economies because institutions in the latter are less developed

and still evolving. Studies that lump together countries representing both mature and emerging economies may not be able to discern potential disparities concerning the effects of institutions on individuals' entrepreneurial behavior according to stage of socioeconomic development.

Second, instead of looking to general entrepreneurship (Shane, 2009), this study examines an entrepreneur's propensity to create potentially new and unfamiliar technological products or services. Since technological improvements power the transition from the manufacturing-driven stage to the innovation-driven stage of economic development (Wennekers, Wennekers, Thurik, & Reynolds, 2005), a closer look at the factors influencing technology entrepreneurship is of particular importance in the context of emerging economies.

Using employment choice theory as a guiding theoretical framework, previous literature views national institutions as incentive structures that signal the availability of resources as well as the degree of ease with which technology entrepreneurs can acquire, mobilize, and blend resources to maximize economic rents, therefore affecting the choice of technology entrepreneurship as a career (Douglas & Shepherd, 2002). Policies concerning intellectual property rights (IPR), foreign direct investment (FDI), and barriers to technology adoption (BTA) are particularly controversial in that their effects may differ considerably between developed and emerging economy contexts. For example, some developing countries may want to attract FDI but avoid strong IPR regimes, yet policymakers often tie these policy choices together in trade agreements. Unfortunately, high BTA that often characterize emerging economies are already likely to decrease the potential for beneficial knowledge spillovers from FDI and strong IPR may further impede these spillovers. Knowledge spillovers are among the most important theoretical drivers of technology entrepreneurship, making them important considerations for policymakers as they formulate and negotiate trade agreements. In

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summary, this study's guiding theoretical question is the following: how do national level factors affect technology entrepreneurship in emerging economies?

In order to answer this question, this study's theoretical framework and empirical design entail two distinct levels – individual-level variables (level-1) and country-level variables (level-2) – such that multi-level estimation techniques are appropriate to test the proposed hypotheses concerning drivers and deterrents of entrepreneurs' entry into technology entrepreneurship. The dataset combines measures of individual-level technology entrepreneurship collected from the Global Entrepreneurship Monitor (GEM) survey on 20 emerging economies for 2002–2008 with measures of country-level institutions from the Index of Economic Freedom (IEF), World Bank Group, and the work of Cassou and Xavier de Oliveira (2011). The results suggest that FDI and BTA both exercise negative effects on the likelihood of entrepreneurs' (hereafter also referred to as individuals) propensity to engage in technology entrepreneurship. The interaction between IPR and FDI also diminishes this likelihood. Thus, the present study makes an important contribution to a literature that has thus far provided equivocal findings about the role of these institutional factors in emerging economies.

This paper structures the remaining text as follows. Section 2 develops hypotheses about the main effects of IPR protection regimes, FDI, and BTA on technology entrepreneurship as well as on the interactions between IPR and FDI and between IPR and BTA. Section 3 introduces the study's data sources, measures and multi-level modeling methods. Section 4 presents the results of the hypothesis tests using a sample of potential technology entrepreneurs in 20 emerging economies. Section 5 considers the study's implications, limitations, and future research potential, and concludes the paper.

2. Theory and hypotheses

Utility maximization is a driving force behind entrepreneurship. In particular individuals' decisions as to whether or not to engage in entrepreneurial activities depend upon the net gain expected over the opportunity cost of potentially reduced or foregone wages, or salaried work (Douglas & Shepherd, 2002; Hayton et al., 2002; Reynolds et al., 2005). From the employment choice perspective, national institutions affect the incentives of entrepreneurs considering entry into technology entrepreneurship as a career. By regulating economic activity and affecting transaction costs, institutions may increase or decrease the net gains that entrepreneurs may expect from engaging in entrepreneurial behavior.

Theories about entrepreneurial development across diverse institutional environments gain insights from the works of Douglas North (1990, 1994, 1997, 2005) and William Baumol (1990, 1993). Entrepreneurs – the focal agents of change – perform entrepreneurial behaviors and adapt their activities and strategies in response to threats and opportunities created by prevailing formal and informal institutions. According to North (1990) and Scott (2002), informal institutions exert their influences through an individual's considerations of the social desirability and cultural legitimacy of entrepreneurship as a career choice (Ajzen, 1991; Cassar, 2007; Krueger, Reilly, & Carsrud, 2000). By contrast, formal institutions regulate an individual's financial incentives for choosing such a career. Thus, institutions influence not only what individuals search for and observe, but also how they react to potential entrepreneurial opportunities (e.g., Hwang & Powell, 2005; Thornton, 1999).

The current study theorizes the direct effects of three national level institutions (BTA, FDI, and IPR) on technology entrepreneurship in emerging economies and considers interaction effects between IPR and FDI, and IPR and BTA on technology entrepreneurship in such nations. Fig. 1 shows the proposed theoretical model.

Evidence for and against IPR as institutional drivers of innovation, economic development, and entrepreneurship remains mixed. The conventional wisdom holds that IPR in the form of patents facilitates the dissemination of information and stimulates research and

development, leading to higher economic growth (e.g., Aghion & Howitt, 1992; Allred & Park, 2007; Branstetter, Fisman, & Foley, 2006; Gallini, 1992). Conversely, Jaffe and Lerner (2004) argue that the quality and importance of patents is declining as their numbers proliferate, thus leading to diminishing returns on their expected impact on economic growth. Similarly, Furukawa (2007) suggests that sector monopolization enabled by strong IPR regimes reduces the potential for economic growth. Strict enforcement of IPR also creates impediments to innovation by favoring inventors over innovators (Acs & Sanders, 2008; Workman, 2012). More recently, Autio and Acs (2010) demonstrate that strong IPR negatively moderates the relationship between level of education and entrepreneurial intentions, and positively moderates the relationship between level of income and entrepreneurial intentions. Although the latter study does not differentiate between mature and emerging economies, the results hint at the possibility that level of development may be an important variable in the relationship between IPR regime strength and technology entrepreneurship.

Evidence concerning the impact of FDI – defined as the net inflow of investment by foreign firms or investors – on entrepreneurship is ambiguous. For example, in a study assessing the influence of FDI on new firm entry in the Belgian context, De Backer and Sleuwaegen (2003) observe this relationship to be negative owing to the crowding out of domestic entrepreneurs. In another study that looks at the influence of FDI on domestic firm entry in 245 industries in the Czech Republic during the period 1994–2000, Ayyagari and Kosová (2010) find that FDI can promote the entry of domestic firms within some industries due to knowledge spillovers. Knowledge spillover theory applied to FDI partially explains the higher rates of recent knowledge-based entrepreneurship in Ireland relative to Wales (Acs, Brookesbank, O'Gorman, Pickernell, & Terjesen, 2007). Similarly, a study comparing four Asian countries – Malaysia, Singapore, Hong Kong and Thailand – observes heterogeneity in the relationships between FDI and local entrepreneurship across these countries, despite their surface similarities on a macroeconomic level – relatively high savings rates, healthy growth prospects, political stability and low labor costs (Lagace, 2002). The influence of FDI on local entrepreneurship could be much more subtle at the microeconomic level, especially in the context of emerging economies, where fledgling institutions are more likely to influence individual-level entrepreneurial behavior.

Finally, economists have long sought to develop policy-oriented theoretical frameworks explaining economic growth. Despite its constraints, Robert Solow's (1956) seminal work remains the baseline

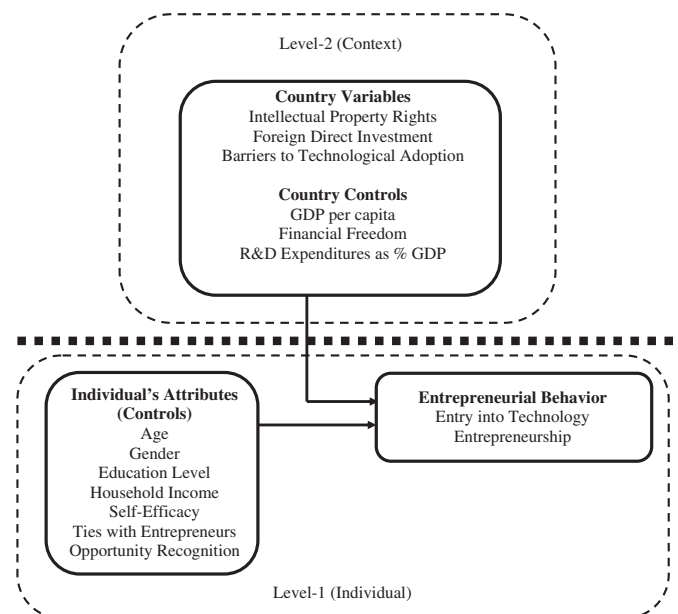


Fig. 1. Theoretical model.

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