# DOES STRONGER IP PROTECTION SPUR NEW VENTURE CREATION? PATTERNS OF FINANCIAL INNOVATION EXPLOITATION

*Peter T. Gianiodis, Duquesne University, USA*
*Mark Geiger, Duquesne University, USA*
*Matthias Thürer, Jinan University at Zhuhai, China*

## ABSTRACT

Firms compete in different technological regimes, which subject them to varying technological opportunities and appropriability conditions. In this study, we examine how changes to the prevailing technological regime governing financial services innovation influence two important outcomes: entry/exit by new ventures and rate of IPOs within the financial services industry. Research on technological regimes have generally focused on industries or innovation systems where firms patent proprietary technologies to address the threat of misappropriation; however, we examine a context, financial services, where patenting innovation has only complemented prior technology strategies. Employing a unique data set, we predict that a change to the technological regime governing financial innovation is associated with higher rates of industry entry and exit, and the proliferation of industry-related IPOs. Preliminary results find support for these predictions. The study offers novel theoretical and empirical insights to scholars as well as implications for entrepreneurial firms and policy makers considering decisions that influence the prevailing technological regime governing financial services innovation.

## INTRODUCTION

How firms create value and which firms are able to capture this value within a technological regime are pressing questions in the strategic entrepreneurship literature. A technological regime represents the prevailing innovative processes including technological opportunity and appropriability conditions, which supports the patterns of innovation in an industry (e.g., Audretsch & Acs, 1990). Important to understanding the workings of technological regimes is acknowledging the influences of technological trajectories and paradigms. This includes the role played by sector and technology specific factors such as the actors creating new technologies and the institutions that govern their behavior. Yet, only recently has the relationship between conditions within technological regimes and entrepreneurial activity become a central focus of scholars and practitioners (Kim & Lee, 2016; Vanloqueren & Baret, 2009). While recent research in this area has advanced the field of strategic entrepreneurship, important questions related to how changes to technological regimes affect an entrepreneurial eco-system remain unanswered. An entrepreneurial eco-system is a dynamic entity consisting of multiple actors with diverse motives and often competing interests; any change to it may affect individual actors, clusters of firms within the ecosystem, as well as the entire ecosystem.

In this study, we investigate how changes to a technological regime affects market entry/exit and entrepreneurial activities like raising funds through initial public offerings (IPOs). Rates of market entry and exit reflect the extent to which technological regime change helps consolidate the market positions of industry incumbents, or alternatively provides opportunities to de novo or de alio entry (Malerba & Orsenigo, 1997). Likewise, market entry may be fueled by better funding

conditions as when a technological regime change provides opportunities to displace incumbents' leadership positions through technological dislocation (Kim & Lee, 2011). Considering the above issues, we propose two research questions:

*How do changes to a technological regime affect market entry and exit rates?*

*How do changes to a technological regime affect IPO activity in the industries in which it governs?*

To address these questions, we investigate how changes within the technological regime governing financial innovation affected market entry/exit and IPO activity within the financial services industry. We model technological regime change as a natural experiment; specifically, the U.S. court's decision in the *State Street Bank vs. Signature Financial Group* case, which legitimized the usage of patent protection of financial innovation, strengthened IP protection for firms employing a patent strategy. We consider this a change from the prevailing norms (cf. Dosi, 1982, 1988; Nelson & Winter, 1982), and as part of a larger research program examine how this change affected the rate of new venture creation, market entry/exit, and IPO activity and firm-level performance. By examining these issues, this study may add clarity to the equivocal findings of recent research concerning IP protection. For example, Dushnitsky and Lenox (2005) find that weak IP regimes result in greater investment in new ventures. By contrast, research has shown that strong IP regimes are a boon for new venture creation (e.g., Drover et al., 2017). By reconciling these competing findings, this study contributes to the literature on strategic entrepreneurship and innovation management.

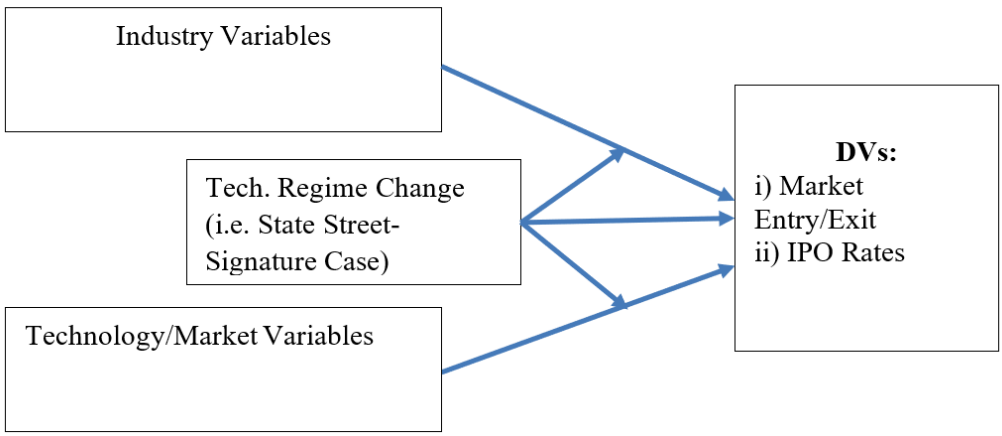
## HYPOTHESES DEVELOPMENT

Given the exploratory nature of this study, we offer the following conceptual model that is central to our research program (Figure 1). Prior research has identified several factors that influence market entry and exit rates – industry conditions such as the HHI index that measures industry concentration (e.g., Cetorelli & Strahan, 2006), market-level attributes such as density (e.g., Lambkin, 1988), and technology-specific attributes such as sourcing and knowledge breadth (e.g., Gruber et al., 2013). Similarly, there is a rich research tradition that examines the influences on IPO rates within and across industries; for example, Robinson and his colleagues (1999, 2001) examined the four primary influences – (1) stage of life cycle, (2) industry concentration, (3) entry barriers, and (4) product differentiation – on the rate and performance of firms who had just underwent an IPO. There also exists a significant stream of research that examines the life cycle of IPO firms from motivation to go public and the these firms price their initial stock offerings, to their long-term performance (cf. Ritter & Welch, 2002 for a review).

We add to this impressive literature by focusing on the influence of technological regime changes on market entry rates and rates of IPO activity. Environmental changes often disrupt an industry's *technological regime*, which describes the prevailing patterns of innovation in an industry including technological opportunity, appropriability, as well as knowledge diffusion (Nelson & Winter, 1982). Firms are likely to face external competitive threats that may fundamentally change existing business models, processes and routines, and consequently, displace industry incumbents (Ansari & Krop, 2012; Tushman & Anderson, 1986). Technological regimes impose conditions determining which firms are likely to *create value* through innovation and more importantly, which firms tend to *capture value* by limiting emulation and (mis)appropriation (Kim & Lee, 2016). Changes to technological regimes influence how incumbent firms invest in R&D and to the

extent to which new entrants can exploit changes to the regime (Dosi, 1982; Eisenhardt & Martin, 2000).

**Figure 1: The Conceptual Model**




**Technological Regime Change and Market Entry and Exit**

Researchers make a distinction between an *entrepreneurial regime*, which facilitates the entry of new innovative firms, and a *routinized regime*, which facilitates innovation by incumbent firms (Winter 1984). Empirical research suggests that there is a high proclivity for new entry and that new entrants are more likely to succeed under an *entrepreneurial* technological regime (e.g., Shane & Katila 2005); whereas, a *routinized* technological regime favors incumbents – due to barriers to entry, access to complementary assets, etc. (e.g., Rothaermel & Boeker, 2007; Vanloqueren & Baret, 2009). Specifically, when an industry changes from a more *routinized* to one that is categorized as *entrepreneurial* it attracts attention from motivated actors across the value chain, including entrepreneurs who are emboldened by a more favorable operating environment, and key stakeholders such as investors who can achieve a higher return. While technological regime change can appear imminent, we expect that this transition may be gradual as the various actors align interests to exploit new opportunities. Similarly, as incumbent firms face greater competitive pressures stemming from a more dynamic external environment, they are more likely to reduce their operations or at the extreme exit the industry. Hence, we make the following predictions:

> *Hypothesis 1: A change in an industry's technological regime will be associated with an increase in (a) market entry by de novo and de alio entrants, (b) market exit by industry incumbents, and thus (c) a higher "churn" rate within the industry.*

**Technological Regime Change and IPO activity**

Empirical research suggests that IPO activity is closely related to industry munificence – as rising tides lift all boats, incumbents as well as firms seeking to capitalize on new opportunities. Technological regime change may be an occasion where previous barriers to entry or structural

impediments created caution for new venture founders and/or their investors. For example, Florin and his colleagues (2003) found that beyond the human and social capital embedded in a new venture's founders, IPO rates and performance were affected by prevailing industry conditions. We extend this logic further and suggest an event-driven change to an industry's prevailing technological regime can act as a springboard for greater IPO activity. In particular, research on *herd behavior* underscores its sensitivity in capital markets, especially ones as volatile as the market for public offerings (cf. Nelson, 2002). We expect that a change from a routinized to a more entrepreneurial technological regime may trigger herd behavior as investors seek to capitalize on market momentum. Hence, we make the following predictions:

> *Hypothesis 2: A change in an industry's technological regime will be associated with an increase in (a) the rate of IPO activity and (b) the intensity of IPO activity within small windows.*

**Methods and Data**

This study takes place in the financial services industry within the U.S. and Canadian markets. We conduct our empirical test through a natural experiment – we examine the *State Street-Signature Financial* decision's effect on the technological regime governing financial innovation (cf. Lerner, 2002, 2006). We employ two perspectives on the change resulting from the *State Street-Signature Financial* decision: (i) two discrete regimes with Pre (prior to 1999) vs. Post (after 1999) State Street decision using a one year lag; and, (ii) three discrete regimes with Pre-State Street (1980-1993), State Street Conflict (1994-1999), and Post-State Street Decision (2000-present) (cf. Gianiodis & Thürer, 2018). Employing these two models of change allows us to determine the extent to which uncertainty (i.e., the period from the initial legal action made by Signature in 1994 to the court decision made in 1998) influenced entrepreneurial activity and performance.

We collected data on entry, exit and IPO rates from multiple data sources: (1) government agencies (e.g., Census Bureau), industry reports (e.g., Marsh & McLennan), and the Kauffman Foundation, just to name a few. Data on financial patents were collected from the USPTO. In addition, we collected firm-level data from CRSP data files, COMPUSTAT, and other public sources.

**Variables**

We use three sets of predictor variables – *industry* measures including HHI index, R&D intensity just to name a few, *firm* measures including size, age, etc., and *technological/market* measures including patenting activity, open innovation partners, etc.. We employ three dependent variables: *market entry*, a count measure of the number of new entries into the financial services industry in a given year; *market exit*, is a count measure that tracks incumbents' exit from the industry in a given year; and *IPO rate*, which captures the number of IPOs in a given year. All data is from the years 1989 (5 years prior to the initial *State Street-Signature* litigation) through 2004 (5 years after the final *State Street-Signature* court decision).

**Analyses**

We employ two tests. We address our research questions by using event-history analyses of discrete change events in which we test whether the rate of new entry/exit significantly changed after the decision – did stronger IP protection trigger greater de novo and de alio entry – and did it also increase the rate and intensity of IPO activity? Alternatively, we employ a Cox logistic

regression to determine changes to a discrete count variable. We expect both analytical techniques to yield similar results.

**Results**

A full analysis is not complete, but preliminary results suggest that our predictions have merit. We predicted that the rate of new venture creation and entry will increase during the "uncertainty period" between 1994-1999, and then accelerate along with incumbent exit after the *State Street-Signature Financial* decision. Likewise, we hypothesize that firm survival is highest among new entrants that demonstrate active patenting activity, although the size of the patent portfolio is not materially important. In other words, we expect firms with higher quality patents, regardless of the aggregate number, to be more likely to survive and thrive.

## DISCUSSION AND IMPLICATIONS

Our study makes three important contributions to the literature. *First*, it adds greater specificity to the technological regime-strategic entrepreneurship relationship. Attending to this nexus adds a relatively objective perspective, and clarity, to the findings of prior research. For example, it demonstrates the dynamics of the relationship over time. *Second,* by modeling change within the technological regime we can better understand patterns of entry and exit. This enhances the literature on entrepreneurial opportunity recognition and exploitation because it details the impact of strengthening IP ownership. *Third*, our findings add to the growing literature on IP/patent-based strategies by demonstrating how strengthening IP can lead to greater access to financial capital in the form of an IPO, thus, enhancing firm survival. Our predictive findings suggest this relation is more nuanced than previously thought, that is, quantity of IP is less important than the quality of IP. In sum, this study helps to reconcile the equivocal findings related to the IP protection-market entry and exit relationship.

**CONTACT:** Peter T. Gianiodis; gianiodisp@duq.edu; (T): 412-396-6255; (F): 412-396-6250; Palumbo Donahue School of Business, Duquesne University, Pittsburgh, PA 15282, USA.