

Spinoffs versus non-spinoff entrepreneurs

Exploring post-bubble Japan's entrepreneurial ecosystem

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Abstract

Purpose – The purpose of this study is to explore the role of spinoff entrepreneurs in the post-bubble Japan and ultimately to facilitate policy reforms that benefit entrepreneurs most in need of support.

Design/methodology/approach – This study adopts a survey of Japanese entrepreneurs from 2003 to 2013. Exploiting the survey questions, the authors separate spinoff startups from the non-spinoff startups. Using this data set, this study first performs a logistic regression, followed by a chi-squared independence test between spinoff startups and firm performance.

Findings – This study finds that while both human and social capital predict the probability of a firm's positive performance, industry experience was the strongest predictor for the probability of performance.

Originality/value – As Garvin (1983) stated, most research on spinoffs are limited to both industry type and location. The theoretical contribution of this study is to broaden the applicability of current entrepreneurship theories by considering industries beyond technological startups. The practical value of this study is to begin evaluating policies and their interaction effect with cultural context.

Keywords Japan, Social Capital, Performance, Human Capital, Spinoffs, Industry experience

Paper type Research paper

1. Introduction

In his last book, *21st Century Japanese Management – New Systems, Lasting Values*, James C. Abegglen (2006, p. 89) makes a bold claim: Japanese management, characterized by “the

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The data for this secondary analysis, the National Life Finance Corporation Research Institute's (in 2008, renamed Japan Finance Corporation, a public corporation wholly owned by the Japanese government) “Survey on Business Start-ups in Japan” (“Shinki Kaigyou Jittai Chousa”, in Japanese), were provided by the Social Science Japan Data Archive, Center for Social Research and Data Archives, Institute of Social Science, The University of Tokyo.

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concept of community in which all fully and fairly participate as one does in family, village, and neighbourhood”, has not changed over the past half-century of socio-economic changes. An outgrowth of this community and relationship-centered system is the social contract between the firm and employee, whereby the firm guarantees lifetime employment in return for the employee's lifetime commitment to remain with the company. However, since the publication of the book, many things have changed, including the recession that instigated the government's desperate attempts to create an environment more conducive to entrepreneurship.

Despite top-down legal reforms, Japan's entrepreneurship level still fares poorly compared to that of other advanced economies. For instance, according to the World Bank's, 2017 Doing Business report, Japan's new business entry density (i.e. the number of newly registered corporations per 1,000 working-age people) is 0.15, ranking last among the Organization for Economic Co-operation and Development (OECD) countries (World Bank, 2014).

To what extent does Abegglen's statement hold true in the realm of Japanese entrepreneurship? Entrepreneurship, at the heart of it, is the act of creating new organizations (Gartner, 1988). This creative process of establishing a sustainable and profitable firm requires an entrepreneur to possess a certain level of creativity, drive, skill and motivation. Entrepreneurship is dependent on a number of factors, including the institutional barriers to startup, the country's resource endowment, human capital (i.e. founder's personal capability) and social capital (i.e. founder's resources garnered through prior experience in a firm). Researchers have tried to disentangle these multitude of factors, driven by a desire to extract key elements which have a significant influence on the performance.

Because of the manifold nature of entrepreneurship, researchers have debated over the definition of the entrepreneur and the factors that differentiate successful entrepreneurs from less successful ones. One such determining factor is an entrepreneur's prior experience: as Rothwell and Zegveld noted over three decades ago, “large and small firms do not work in isolation”. After studying 100 small- and middle-sized enterprises (SMEs) in the UK, they concluded that 84 firms had a significant link with a large firm in R&D, marketing or manufacturing relationships (Rothwell and Zegveld, 1982, p. 942). We extrapolate this idea of small-large firm linkage in the context of startups that were founded as spinoffs from larger firms. There have been competing definitions of the term “spinoff”, where some scholars have taken a broad understanding of it as simply referring to prior work experience in any industry (Eriksson and Kuhn, 2006; Muendler and Rauch, 2011), whereas others have taken a narrower conceptualization as work experience in the industry (Dahl and Sorenson, 2013). In this paper, we will apply the broader definition of a spinoff entrepreneur as any entrepreneur having previously been employed in another firm.

The development of spinoffs as a field in entrepreneurship is a shift away from the notion that entrepreneurs are independent innovators pulling ideas from thin air and instead a recognition that “people who form new firms have histories” (Aldrich, 1999; Freeman, 1986; Helfat and Lieberman, 2002). These histories are not limited to industry-specific knowledge and skillsets, but more general work experience and connections that can be applied to other industries. Shane and Khurana (2003)'s seminal study “Bringing individuals back in: the effects of career experience on new firm founding” is largely motivated by the deficit in research on individual-level processes and antecedents to entrepreneurship. In their study of inventions patented by MIT between 1980 and 1996, they found a significant relationship between career histories and the likelihood for a firm to be founded where the invention will be commercialized (Shane and Khurana, 2003). Similarly, in Burton *et al.*'s study of entrepreneurs in Silicon Valley, they observed that these entrepreneurs were more likely to obtain funding because of greater social capital and human capital (Burton *et al.*,

2001). Hence, a great bulk of the literature has come to an understanding that spinoffs are an important pathway for entrepreneurship.

To date, research on spinoffs have largely focused on two areas. First, most firms are from the technology sector (Bollinger *et al.*, 1983; Goodman and Abernathy, 1978). According to Dahl and Sorenson (2013), economists and strategy scholars emphasize the role of technological knowledge in spinoffs, largely because they are attracted to or only have access to high-technology industries (Agarwal *et al.*, 2004; Chatterji, 2009; Klepper and Sleeper, 2005; Yang *et al.*, 2010). Some prominent studies within the high-tech industry include Brittain and Freeman (1986)'s study concerns explicating the rate of spinoff generation from semiconductor firms in Silicon Valley. Stuart and Sorenson (2003) trace all biotech startups that were acquired or engaged in IPOs to infer about the impetus for spinoffs without having to trace the heritage of the biotech entrants. A second vein of research on spinoffs have been predominated in the Western context (Garvin, 1983; Little, 1977; Romijn and Albaladejo, 2002; Sirbu *et al.*, 1976; Utterback *et al.*, 1977). The literature review by Bollinger *et al.* allocates a section on cross-cultural differences of startups, yet the national differences are limited to comparing the USA with other European firms such as Netherlands, the UK and West Germany (Bollinger *et al.*, 1983, p. 6).

The literature on spinoffs has been concentrated on one of these two areas and only a limited number of studies have focused on other regions. Even then, similar industries were addressed. A notable exception is Phillips (2002), who analyzed law spinoffs from Silicon Valley. To analyze the rate at which publicly traded firms spawned venture capital (VC)-financed spinoffs, Gompers *et al.* (2005) used data on startups financed by VC firms that cut across industries. The deficit of cases on spinoffs arising from industries other than high-tech and outside the Western context has made scholars prone to overlooking or discounting realities in non-tech spinoffs (Garvin, 1983).

To fill this gap, we ask, "Do entrepreneurial spinoffs in Japan perform better than their non-spinoff counterparts? If so, what aspect of entrepreneurial spinoffs (prior experience) affect the firm's performance?"

We study Japan because of its particular context that may shed a different light to the studies that have dominated in Western contexts. As Eberhart *et al.* (2012) said, Japan is:

An especially puzzling context. It has a very high rate of technical innovation including an extraordinarily high rate of patenting, and yet it has a comparatively low level of entrepreneurial activity among the advanced economies. (5)

We aim to uncover who the entrepreneurs are in this context, and whether industrial or work experience has an effect on the startup's performance. This question is important from both a theoretical and practical perspective. From a theoretical perspective, our study aims to bridge the strategic adaptation hypothesis and the population ecology hypothesis through the methodology that crosses two level of analysis. The strategic adaptation hypothesis suggests that the key to high entrepreneurial performance depends on the "individual entrepreneurs who identify opportunities, develop strategies, assemble resources and take initiatives" (Low and MacMillan, 1988, p. 142). Population ecology perspective proposes that "individual goal-driven behavior is largely irrelevant and that environmental selection procedures are the most powerful determining factors" (Low and MacMillan, 1988, p. 142). Studying the founder's individual career path, while also acknowledging that entrepreneurship behavior is largely context-dependent, can help bridge the two levels of analysis. We contend that this paper not only addresses an important theoretical question but also has practical implications as well. The low levels of entrepreneurship in Japan has been a rising concern for the Japanese government. Because of claims that Japan's low level of entrepreneurship are caused by

institutional barriers, the Japanese government has increased funding and subsidies for entrepreneurs while also reducing barriers through its new legal framework for bankruptcy in December, 2002 and April, 2003 (Matsushita, 2006). Nonetheless, entrepreneurship rates remain stagnant, providing a reason to focus on more individual-level factors.

This paper presents the results of empirical analyses intending to test three hypotheses on the relationship between spinoffs and startup performance and potential mediating effects. This study will benefit from the relatively large and unique sample of Japanese firms from 2003 until 2013.

The plan of the paper is as follows: We begin with the literature review on the relationship between personal attributes and the founder's startup performance. In this section, we specify the hypotheses of this paper. Next, Section 3 introduces the data and the variables in our analysis. In Section 4, we present our findings. Finally, we discuss the empirical results and conclude the paper.

2. Literature review

Within the entrepreneurship literature, a segment focuses on the relationship between the entrepreneur's personal attributes and the startup's success. In this literature review, we first explain the relevance of the institutional logic when understanding startup behavior, followed by delineating the key independent variables that have been studied to explain entrepreneurial success and ending with the various measures in which entrepreneurial success is defined.

2.1 Entrepreneurial ecosystem: Why Japan?

Entrepreneurial ecosystem was first coined by Dubini, as environments characterized by "family businesses and role models, a diverse economy, a strong business infrastructure, available investment capital, a supportive entrepreneurial culture, and public policies that incentivize venture creation" (Dubini, 1989). Spigel extracts three different constructs: cultural, social and material based on how their benefits are created and governed – of these three, one is social, which include the entrepreneur's networks and social capital (Spigel, 2017). Such capital is accumulated through the prior experience of the entrepreneur.

The Japanese entrepreneurial ecosystem has been a hot topic within the nation, as government officials are desperately trying to find a way to spur the economy. To design more targeted and effective policies, the national discourse has surrounded corporate change that can establish high-performing firms. The lack of vigor in Japan's entrepreneurial ecosystem has been explained by various factors, including cultural, institutional and resource constraints. Some posit the cultural argument stating that the Japanese business culture has never been supportive of disruptive startups and rather focusing on the *zaibatsu* (large conglomerates) with intimate relationship with other conglomerates. Another theory is the institutional element, where the country's legal and regulatory environment are not conducive for startups, because it is considered very rigid and hierarchical. A number of scholars mention the high entry barriers for new businesses in Japan (George, 2005; Hsu *et al.*, 2007; Klapper *et al.*, 2006; Scott, 2013). For example, Hawkins (1993) identified resource constraints as a large barrier to new business creation in Japan, which include knowledge, finance and skilled labor (Lynskey, 2004). Recently, however, Japanese policy makers have introduced a series of liberalizing reforms aimed at creating an environment more supportive of entrepreneurship and new firm creation. Significant changes are occurring in three areas: the provision of equity finance; labor mobility; and the dismantling of barriers to the flow of knowledge from universities. Arguably, these factors impact considerably on the development of

technology-based startup firms in Japan. Such changes are welcome, as Japan has one of the lowest rates of entrepreneurial activity among developed nations (World Bank, 2014). In general, Japan has relatively lower proportions of opportunity-based entrepreneurs and higher proportions of entrepreneurs driven by necessity, such as restructuring.

Eberhart *et al.* (2012) adds another dimension to the institutional obstacle: barriers to failure. These barriers were reduced in December, 2002 and April, 2003 when the Corporate Reorganization Law (Kaisha Kosei Ho) was implemented to decrease the stakes of bankruptcy such as rationalizing bankruptcy procedures, and increase the equitable distribution of residual firm value. This reform allowed greater leeway for CEOs to retain their positions and reduced their liability exposure to assets at risk (Matsushita, 2006; Mori, 2005; Schaeede, 2008). In response to the reduction of the consequences of closing a firm, the study observed the creation of a more conducive environment for entrepreneurship. Given that the legal reform resulted in not only the increase in startups but also better-quality ventures, it corroborates the effect institutional barriers have on a founder's motivation and capability.

2.2 Spinoffs versus non-spinoffs

Spinoffs, defined by Garvin as “new firms created by individuals breaking off from existing ones to create competing companies of their own”, are increasingly seen as a potential pathway for business creation and success rates of a new firm (1983, p. 3). As Dahl and Sorenson (2013) have noted, various terms such as spinouts, spawn, progeny have been used interchangeably and such firms have been found to be advantageous compared to those without prior experience. Shin framed spinoffs as a form of corporate change that “generally entails high organizational outcomes for both parent firm and child firm” (Semadeni and Cannella, 2011; Shin, 2013, p. 31). The benefits that spinoffs inherit from their mother companies include reduction of information asymmetry between managers and investors (Allen, 2001), better managerial incentives (McConnell and Servaes, 1990) and decrease in bureaucratic costs and constraints in the process of monitoring (Jones and Hill, 1988; Porter, 1987; Semadeni and Cannella, 2011). Notably, Ito (1995) states that certain unique traits endemic to Japan create an environment conducive for spinoffs – such as its tendency to have a stronger social framework and group cohesiveness which then create external pressures that limit opportunism and decrease the need for mother firms to worry about the spinoffs engaging in devious behavior (p. 434).

On the other hand, there has been some qualifying studies that have countered the conventional notion that spinoffs perform better. Among the many reasons, two conditions have been most persuasive. First, a spinoff can be subject to structural inertia of its mother firm (Hannan and Freeman, 1984), despite the fact that one of the differentiating advantages of a startup is its agility and responsiveness to change. Yet through inheriting similar organizational logics from its mother firm, it can create strong inertial tendencies, routines, rigidities and risk aversion (Leonard-Barton, 1992; Prahalad and Bettis, 1986; Walsh and Ungson, 1991). Second, when placed in an environment that is not conducive to entrepreneurial behavior or mother-child firm relationships, a spinoff may not necessarily outperform non-spinoff startups. Kazumi and Kawai (2017) discuss the importance of legal support and social legitimacy for Japanese female entrepreneurs who may already be confronting various other hurdles because of their positionality. Another characteristic of Japan's institutional logic is its logic of promoting lifelong employment, therefore acting as an extra hurdle for the birth and flourishing of spinoffs which necessitates the act of breaking the implicit social contract. Factoring in the Japan-specific context, we posit a more qualified association.

H1. Spinoffs will have a higher proportion of success than non-spinoff startups.

2.3 Human capital thesis

Next, we give an overview of the past literature that provides various mechanisms underlying entrepreneurs' comparative advantage and consider the applicability of these theories to spinoff entrepreneurs. Proponents of personality theories claim that personal characteristics of entrepreneurs make them prone to succeeding as entrepreneurs, for their cognitions and beliefs determine their behavior (Brockhaus and Horowitz, 1986; Chell *et al.*, 1991; Cooper and Gimeno-Gascon, 1992; Rauch and Frese, 2000). Nevertheless, there are limitations to using personality as a primary explanatory variable. Aldrich and Zimmer find two problems of research that focus solely on personality-based approaches to entrepreneurship. First, research does not find any particular trait that is strongly correlated with entrepreneurship (Brockhaus and Horowitz, 1986; Gartner, 1988; Low and MacMillan, 1988). Even when a relationship between a character trait and entrepreneurial success is identified, it has been subject to selection bias. Second, personality traits under-predict the extent of entrepreneurship in any nation and over-predict the degree to which entrepreneurs differ from non-entrepreneurs. The authors raise an example of how hundreds of thousands of people in the USA attempt to start their own firm every year and tens of thousands succeed in establishing and sustaining their startup. Yet it is hard to believe that this group of people significantly differ in endowed personality from the rest of the American population (1986, p. 5).

Following their critical analysis, inquiries on the relationship between entrepreneur's human capital and startup performance have incorporated other elements such as the founder's age, education and gender. In Davidsson and Honig (2003)'s study that compared nascent entrepreneurs with a control group of non-entrepreneurs drawn from the Swedish population, they found that formal education predicted those who attempted to engage in nascent activities. Therefore, we hypothesize:

- H2.* Regardless of spinoffs or not, an entrepreneur's human capital has a positive effect on the probability of positive firm performance.

Below, we delineate several key qualities that have been attributed to better startup performance. First, the age of the founder has been thought to be positive correlated with startup performance. According to Cressy (1996), human capital is the "true determinant of [startups] survival" (1996, p. 1253). Among the various elements of one's capital, the author emphasizes the role of the entrepreneur's age and suggests a positive relationship between a firm's survival and the entrepreneur's age. Therefore:

- H2.1.* An entrepreneur's age has a positive effect on the probability of positive firm performance.

Another personal attribute is the education level of the founder. According to Cooper *et al.* (1994), education is said to be related to knowledge, skills, problem-solving ability, discipline, motivation and self-confidence. It is an enabler of problem-solving and innovation – attributes necessary for successful startups. Many studies have used education as a proxy of the entrepreneur's background characteristics, including qualities of commitment, intelligence, problem-solving ability and social legitimacy (Cressy, 1996; Eberhart *et al.*, 2012). Hence, we hypothesize:

- H2.2.* An entrepreneur's level of education has a positive effect on the probability of positive firm performance.

Finally, we include gender as a demographic characteristic of the entrepreneur. Based on convention (especially in the Japanese business climate that has been traditionally male-dominated), we may expect women to have had fewer opportunities to gain the relevant

experience, develop contacts, and attain access resources (Cooper *et al.*, 1994). Nevertheless, the findings for gender have been mixed: Sexton and Robinson (1989)'s study found that startups with female founders were performing poorly, while Kalleberg and Leicht (1991) did not find gender to be a significant differentiating factor. Given the Japanese context, we hypothesize:

- H2.3. In Japan, female-owned startups are negatively correlated with firm profitability than male-owned startups.

2.4 Social capital thesis

One of human capital's key competing theories is the social capital thesis, the claim that the entrepreneur's individual attributes are what largely determines startup performance. A pioneer in this line of thought is Howard Aldrich, who posited the personal network theory to entrepreneurship, whereby the success rate of such firms is partially dependent on the entrepreneur's networks garnered through prior experience (Aldrich and Zimmer, 1986). It is important to note that for an entrepreneur to qualify for Aldrich's theory, one does not need industrial experience but rather a more general work experience. In other words, it is not the specific skillsets garnered in the previous workplace that matters, but rather more broadly, human connections and maturity that come with entering the workforce. Subsequently, the personal network theory has become a popular theoretical perspective in the debate concerning spinoffs and the mechanism prior experience facilitates startup success. Other empirical works have supported this theory, such as Lee and Tsang (2001)'s study, where they investigate three potential explanations for startup success in 168 Singaporean ventures: entrepreneurial personality traits, background and size and frequency of their networks on venture growth. They find that among the factors, an entrepreneur's industrial and managerial experience had the greatest impact on venture growth. Waldinger *et al.* (1990) derive a similar conclusion in their study of how kinship ties play a role in immigrant entrepreneurs' acquisition of resources.

Contrary to scholars who have emphasized the role of relationships in benefiting startup performance, others have claimed that industry-specific skills determine the competitive advantage of spinoffs. One such theory is Brüderl and Preisendörfer's network success hypothesis, which claims that entrepreneurs who have prior connections with industries can better leverage on these resources to establish a successful enterprise. They tested this hypothesis using 1,700 startups in Germany, where their findings supported their propositions (Brüderl and Preisendörfer, 1998). Furthermore, Agarwal *et al.* (2004) found that spinoff entrepreneurs benefit from preferential access to the product designs and production designs and production processes of their former employers. More generally, industry spinoffs benefit from knowledge that only those in-the-know (Klepper and Sleeper, 2005). Inexperienced founders tend to have weaker and scarcer relationships (Shane and Khurana, 2003). Phillips (2002) argues for the organizational benefits of founders with prior experience in the industry, for they have access to organizational blueprints for establishing more effective and reliable routines in their fledgling firms. Finally, it has been shown in tech startups in Calgary, Alberta that the founder's prior industry experience will increase access to investment capital and the labor pool, both crucial factors to sustain and grow the startup (Spigel, 2017). Therefore, we hypothesize:

- H3. The probability of the firm's performance is positively correlated with the founder's prior industry experience of both spinoffs and non-spinoff startups.

2.5 Measures of success

There are numerous ways to measure startup success. One of the most common measures has been the firm's survival rate (Agarwal *et al.*, 2004; Brüderl and Preisendörfer, 1998; Chatterji, 2009; Phillips, 2002). Harada (2003) explains the validity in using survival rates as a measure given that conventionally, economists assumed that profitability of the firm would be a sufficient incentive in keeping the founder in the business. Furthermore, survivability is also beneficial in that it is easily measured through surveys. However, survivability as a measure of performance is limited in its nature as an indirect measure of success. Hence, it cannot distinguish highly performing firms and entrepreneurs who are highly motivated or tenacious. This means that hypothetically, entrepreneurs who are overly obstinate and optimistic may choose to remain in business even when they are losing money.

Other measures of performance concern economic performance. This includes growth rate (Brüderl and Preisendörfer, 1998), innovativeness (Agarwal *et al.*, 2004), sales, profitability, time it takes for the firm to breakeven and surplus. In this paper, we adopt this economic performance as the primary measure. To date, very few studies have tried to measure the economic performance of the startups and studies that have, were limited in the sample size for generalizability. For instance, Gelderen *et al.* (2000) constructed a total success score combining six performance variables (turnover, profit, personnel, personal income, goal reaching and subjective success) and examined the determinants, using 49 samples of small business founders in Amsterdam, The Netherlands (Harada, 2003, p. 213). Most of these studies have been based on small samples, and in response to this gap, Harada (2003) used three indices for economic performance:

- (1) whether the new firm records a surplus (profitability);
- (2) whether actual sales after startup exceed the entrepreneur's expected sales (sales); and
- (3) whether the entrepreneur's annual income exceeds his or her annual income before the startup (income).

Using these three measures, the author uses the data from the "Survey on Business Start-ups in Japan" ("Shinki Kaigyō Jittai Chōsa", in Japanese) from 1992 to 1996. For our paper, we obtain the entrepreneurship data from the same source, but have updated the time period from 2003 to 2013 for greater generalizability and reflection of more recent trends.

3. Method: data, variable, methods

3.1 Data

For this study, we used a survey from the National Life Finance Corporation Research Institute's (in, 2008, renamed Japan Finance Corporation, a public corporation wholly owned by the Japanese government) "Survey on Business Start-ups in Japan" ("Shinki Kaigyō Jittai Chōsa", in Japanese) that is based on a representative sample of individuals who founded companies in Japan annually. This survey has been conducted since 1991, and ask a variety of questions concerning the entrepreneurs' attributes, financing, social connections and their motivations for starting a business. To assess the relationship between spinoffs and performance, we used entrepreneur's work experience and industry experience as measures of spinoffs and their social capital, respectively. As a competing hypothesis, we then use age, gender and education as measures to test the human capital hypothesis.

3.2 Success variables

To measure the success of the startup, we adopted two indices used in the past: profitability and sales.

- (1) profitability = 1, if the new firm is in surplus; and
- (2) sales = 1, if actual sales surpass the entrepreneur's expected sales before startup.

All of these measures are binary variables. As we mentioned in the literature review, among the many performance measures that have been used in the past, this one falls within the category of economic performance and overcomes the shortcomings of survivable rates. The analysis first asks whether adding various entrepreneur's characteristics has an effect on startup profitability. Later, when we failed to find a significant relationship between spinoffs and profitability, we adopted another success measure, sales, in our chi-squared independence test. This is to account for the fact that in small firms, the concept and measurement of profitability is ambiguous because they often follow firm-specific accounting policies. The second sales measure is recorded 1 when the actual sales exceed the expected sales, and the startup can be understood as successful.

Table I shows the mean values of the performance measures, which can be interpreted as values demonstrating the entrepreneur's success probability. From this table, we find that the 54 per cent of the new ventures were profitable, and 33 per cent of the new ventures' sales level exceeded expectations. The probability of the startups being profitable were higher than that of sales. This is an unexpected finding given that in Harada's paper using data on Japanese entrepreneurs over, 1992 to 1996 but with a sample size half the size, he found that probability for profitable ventures was much lower than for sales.

The table also shows the mean values of the startup's economic performance grouped by the founder's age. There seems to be no drastic difference across the age groups, but we do see a tendency for the probability to reach the highest values earlier in the entrepreneur's career (i.e. probability for profitable firm peak when the founder is aged 30-34). This outcome counters proponents of the human capital hypothesis, namely given that they see age as a proxy of the rise in the individual's capabilities (Cressy, 1996). Further studies should be conducted to evaluate whether this is a discrepancy between the Japanese business climate (for example, in the older generation, there is a tendency for people to be modest and care about saving face, exaggerate their expected sales, and hence, it is unreasonable for sales to exceed expectations) or a critique against the human capital camp's overly simplistic view that there is a marginal increase in capability as age increases.

Table I.

Mean values of
success measures

Age	Profitability	Sales	n
Whole sample	0.54	0.33	9,231
<i>Classified by entrepreneur's age</i>			
<30	0.59	0.35	786
30-34	0.61	0.35	1,707
35-39	0.57	0.32	1,826
40-44	0.54	0.35	1,434
45-49	0.51	0.32	1,184
≥50	0.46	0.32	2,294

3.3 Independent variable: spinoffs

The variables of primary interest for this analysis are those measuring whether the entrepreneur is a spinoff and if so, the nature of the spinoff (experience in same industry or management experience). Using different questions of the survey, we constructed two support variables: prior industry experience, prior work experience.

- (1) *Prior industry experience*: To gauge whether the founder had prior industry experience, the survey included a question “Have you had any prior experience in an industry related to your current startup?”, where the responses were coded as 1 for yes or 0 for no. Corresponding industry experience is 88.5 per cent, indicating that most entrepreneurs in Japan have industry experience before starting a venture. This supports the social capital hypothesis.
- (2) *Prior work experience*: Similarly, to distill whether prior experience necessitated specific industry experience or a more general work experience was better predictors of firm performance, we used another survey question that asked “Did you have any work experience prior to starting the enterprise?” The respondent’s dichotomous answers were recorded as 1 – yes, 0 – no and had the choice to respond 1 – no or 2 – yes. Consistently, over 90 per cent of the entrepreneurs answered they had prior work experience.

3.4 Statistical method

Using the data set from 2003 to 2013[1] of 9,231 venture firms, we first ran a logistic regression (Lee and Marvel, 2014) to investigate which variables – if any – best determine firm performance. Peng *et al.* (2002) state that logistic regression is appropriate for testing hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables (p. 4). Given that both our dependent variable (profitability) and independent variables (spinoffs and higher education) are binary, we determined that this method would best suit our data. Next, to better understand the relationship between spinoffs and firm performance, we conducted a chi-squared independence test (Baum and Locke, 2004; Kolvereid, 1992). This modeling takes into account the exploratory nature of this paper and most appropriate for the nature of the data because it allows one to test the relationship between two nominal variables.

4. Results

Table II presents the results of our analysis. Model 1 estimates the human capital hypothesis based on the entrepreneur’s age (at the time of establishing the startup), gender (dummy variable coded 1 as male, 0 as female) and education (dummy variable coded 1 as entrepreneurs who received university or higher education, 0 as those who did not). This model accounts for the negative relationship between entrepreneur’s age and firm profitability across all years except for 2003. We see a positive relation between education and profitability in years 2003 and 2007. Gender is also positively correlated with profitability, 2006, 2009 and 2013. These findings support *H2*, albeit with nuances that will be explored in the discussion section.

The second model tests the social capital hypothesis by adding two predictors, spinoffs (dummy variable coded 1 as entrepreneurs with prior work experience, 0 as those who did not) and industry experience (dummy variable coded 1 as entrepreneurs with prior industry experience, 0 as those who did not). Spinoffs variable was found to be insignificant across all of the years, while industry experience was positively and significantly correlated with

Table II.
Logistic regression
models testing the
effect of human
capital, social capital
and spinoffs on the
firm's profitability

Variable	2003		2006		2007	
	(1)	(2)	(1)	(2)	(1)	(2)
Age	−0.03 (0.005)	−0.027 (0.005)	−0.034*** (0.005)	−0.032*** (0.005)	−0.03*** (0.007)	−0.027*** (0.008)
Education	0.346*** (0.098)	0.356*** (0.099)	0.045 (0.104)	0.056 (0.104)	0.369* (0.161)	0.366* (0.162)
Gender	0.208 (0.139)	0.159 (0.141)	0.459*** (0.137)	0.435*** (0.139)	0.374 (0.219)	0.191 (0.236)
Constant	1.206*** (0.233)	0.755** (0.269)	1.482*** (0.246)	1.053** (0.38)	1.191** (0.359)	0.451 (0.431)
Spinoff				−0.023 (0.285)		0.325 (0.224)
Industry experience		0.441** (0.131)		0.441** (0.144)		0.587** (0.223)
Predictive accuracy (%)	58.4	59.2	60.6	62.1	62	62.3
−2 Log Likelihood	2648.14	2636.773	2298.962	2289.561	992.269	982.507
Nagelkerke R^2	0.036	0.043	0.046	0.053	0.043	0.06
ΔR^2		0.007		0.007		0.017

Notes: Standard errors reported in parentheses; significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

(continued)

Table II.

Variable	2009		2012		2013	
	(1)	(2)	(1)	(2)	(1)	(2)
Age	-0.028*** (0.005)	-0.027*** (0.005)	-0.028*** (0.008)	-0.026** (0.008)	-0.034*** (0.005)	-0.031*** (0.005)
Education	0.054 (0.112)	0.062 (0.113)	0.286 (0.168)	0.296 (0.17)	-0.216 (0.113)	-0.191 (0.114)
Gender	0.368* (0.155)	0.221 (0.164)	0.253 (0.22)	0.131 (0.241)	0.417** (0.149)	0.401** (0.152)
Constant	1.08*** (0.255)	0.454 (0.304)	1.244*** (0.388)	0.593 (0.447)	1.754*** (0.272)	0.661 (0.761)
Spinoff		0.285 (0.156)		0.178 (0.224)		0.358 (0.708)
Industry experience		0.533** (0.169)		0.816*** (0.222)		0.779*** (0.153)
Predictive accuracy (%)	58.2	59.1	64.2	64	65.6	66.9
-2 Log Likelihood	1988.77	1974.304	926.934	912.358	1916.602	1889.836
Nagelkerke R^2	0.031	0.044	0.031	0.058	0.048	0.072
ΔR^2		0.013		-0.2		0.024

profitability across all six years. From these two models, we conclude that although both human and social capital predict the probability of firm's performance, industry experience acts as the strongest predictor of firm performance.

As we failed to find additive effects of spinoffs on firm profitability, we used a chi-squared independence test to compare the proportion of spinoffs and non-spinoff startups in the data sets and their relative performance, measured by both sales and profitability. The results are presented in [Table III](#). Across 11 years, an association between spinoffs and proportion of firm performance was observed six times when performance was measured as sales and eight times when performance was measured as profitability. Thus, the data offer modest support for *H1*.

5. Discussion

To inquire whether a potential shift in the entrepreneurial ecosystem has occurred in Japan since the economic bubble burst in 1992, we have focused on spinoffs, a specific form of entrepreneurial activity. Spinoffs deviate from the conventional Japanese style management that emphasizes a lifetime employment at one's initial workplace; hence, it can be used as an entryway to evaluate changes in Japanese entrepreneurial culture. However, the first hurdle is a conceptual question: what is a spinoff? We tested this question through setting up two competing hypotheses – human capital, which emphasizes the benefits attained through prior work experience and social capital, which posits that the industry specific assets and connections contribute to spinoffs' superior performance. Contrary to our *H2.1*, we found age to have a negative relationship with profitability. Although past studies have placed age as indicator of experience and, therefore, a measure of human capital, the results show that the nature of startups may differ from usual businesses. The strengths of startups are often claimed to be their flexibility to changing market needs and circumstances. As age often is associated with greater path dependency and risk aversion, it may counteract the very strengths of startups. The positive relation between gender and profitability attests to the still male-centered corporate culture in Japan ([Olcott and Oliver, 2014](#)). Although we did see a positive relationship between the entrepreneur's education level and firm profitability in two years, we hesitate to make a statement given that the results were not consistent.

The significant and positive relationship between industry experience and firm performance provides strong support for the social capital hypothesis. On the other hand, we failed to find a significant relationship between spinoffs and startup's profitability, at least by operationalizing spinoffs as work experience. Several implications can be drawn from this result. First, in the Japanese context, spinoffs should be defined as entrepreneur with prior industry experience rather than solely work experience. Second, the stark contrast between industry and spinoff measures indicates that the benefit garnered by spinoffs is specific to experiences attained in related industries. The fruits specific to industries could be supplier or customer connections obtained in the prior workplace that can be translated in the startup or understanding the implicit norms particular to the sector. Future studies can try to pin down the exact mechanism that grants spinoffs this competitive advantage.

Here, we raise practical and theoretical implications of this study. On a practical note, this study is one of the few that attempts to observe post-financial crisis entrepreneurship ecosystem in Japan. Many have argued that financial crises acted as a catalysis for the government to enact reforms to encourage entrepreneurship and spinoffs as a viable alternative to earn one's bread and butter. Despite the narrow scope of this paper, we shed light on an important research question: whether top-down reforms can be effective in a country struggling with implicit stigmatization against cutting the lifelong contract with

Variable	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sales	1,115(6)*	1,296 (3)*	1,177 (6)***	969 (6)*	419 (3)	874 (3)*	614 (3)***	926 (6)	610 (3)	347 (3)	922 (6)
Profitability	1,172 (4)	1,379 (2)**	1,295 (4)***	1,035 (4)***	419 (2)*	985 (2)**	730 (2)***	959 (4)	786 (2)*	395 (2)*	1,007 (4)

Notes: Degrees of freedom reported in parentheses; significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table III.
Summary of the
contingency table
between spinoffs and
performance during,
2003-2013

one's employer and entrepreneurial inertia. From a theoretical perspective, this study furthers the emerging studies that have attempted to apply studies on spinoffs that were largely conducted in the Western context to a non-Western environment.

Our study comes with limitations. The Japanese entrepreneurship data likely exclude certain demographics that public surveys struggle to attain contact details – for instance, foreign entrepreneurs living in Japan. We also hesitate to making grand claims regarding entrepreneurship in general or the Japanese business culture because of the limited time period of the data gathered. As mentioned in the onset of this paper, the exploratory purposes of this paper motivated us to pick one aspect – spinoffs – among many other factors that contribute to startup performance. We encourage future studies to look into those factors and see if there are interaction effects among them or whether some are context-dependent.

Finally, we end with research areas that were beyond the scope of this paper but should be tackled by researchers in the future. First, scholars should test other measures such as “the time it takes for the startup to breakeven” and “brand recognition” as dependent variables to test spinoffs with. On a similar note, we encourage researchers to use structural equation modelling techniques to uncover the underlying mechanisms of startup performance. Another research gap is the lack of longitudinal studies tracing the vicissitudes in one nation's entrepreneurship behavior in relation to domestic and international impetuses. We also encourage further studies that investigate the interaction between a nation's corporate culture and business behavior (Hofstede, 1980).

6. Conclusion

In this paper, we sought to better understand the mechanisms behind profitable startups in Japan. Using a data set of over 9,000 firms covering from 2003 to 2013, we formulated hypotheses to test whether human capital (gender, education and age) or social capital (industry experience) explains startup's positive economic performance. We found that industry-specific experience, education and gender played a large role in positively influencing firm performance, while age had a converse relationship with performance. Future studies should investigate the underlying mechanisms of spinoffs having a positive performance. For instance, through in-depth case studies, scholars can shed light to the black box of spinoffs and their influences on firm performance. Although our paper has taken a step in broadening the investigation of the entrepreneurship literature outside the Western context and in a wider industry scope, future studies can continue this trend in other Asian, African and Latin American regions.

Note

1. Data from year 2004, 2005, 2008, 2010 and 2011 are omitted when conducting the logistic regression because they do not meet assumptions necessary for the analysis.

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