

Human and Relational Capital as a Growth Factor

The Case of Korean New Technology Based Venture¹

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Abstract

We analyze the effects of the entrepreneur's human capital and alliances with large business groups in facilitating the growth of new technology based companies in the Korean setting. We explain the signalling mechanism of the entrepreneur's human capital in luring outside resource providers, and then examine the mediating role of business groups. We test our hypotheses using the sample of 170 ventures gone public. We find that entrepreneurs' previous work experience in a related business is most influential in attracting external resources. The results also support the positive role of collaboration with large business groups in terms of the faster IPO.

Introduction

As new technology-based ventures (NTBVs) need a greater amount and variety of resources for research and development (R&D) and marketing to differentiate and commercialize new technologies compared to traditional businesses. So, it is very important for NTBVs to obtain the requisite resources from external resource holders. However, NTBVs involve not only uncertainty that general ventures possess but also additional uncertainty, for new technology is by its very nature highly uncertain [35]. For these reasons, new technology companies are extremely risky. Such uncertainty makes external resource holders hesitant to provide resources to NTBVs, so they have difficulty in obtaining the requisite resources in the markets [8,28]. Given this situation, signaling theory researchers propose that the human capital of founders plays the role of signal to attract venture capital (VC) investment, and that NTBVs that obtain VC investment can perform better than they would otherwise [8,9,10]. Previous studies on the effect of human capital on the new firm survival have often employed an insufficient range of human capital types or inappropriate proxies [13].

A business group (BG), meanwhile, is a respectable organization that can provide various resources including human resources, technology, or marketing as well as finance. Previous studies present the effects of the human capital of founders [3] and alliances with respectable organizations [1,6,14,27,31] on the growth of NTBVs. However, very few studies show how

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the human capital of founders influences an alliance with respectable organizations, and in turn how NTBVs in alliance with BGs grew more significantly.

The present study employs insight from human capital theory and signaling theory to address the research question, “to what extent does the human capital of founders in NTBVs attract alliance with BGs and facilitate growth.” We use human capital theory [22,27] and signaling theory [30,32] to develop hypotheses that predict the effect of different human capital factors on the alliance and growth of NTBVs.

Theory and Hypotheses

Founder’s human capital and the success of NTBVs in developing economies

We suggest the following reasons for the positive relationship between the human capital of founders and the success of NTBVs. First, the relationship between human capital and success is higher in new technology. New technology industries involve the use of sophisticated and complex technologies, and they typically require extensive knowledge and research in dynamic and uncertain environments [36]. Human capital should help particularly in such knowledge-intensive industries because knowledge and valid information reduce uncertainty associated with innovation and dynamic environments [20,24].

Second, the relationship between human capital and success is higher for emerging businesses than for mature businesses. High human capital assists such owners to learn new tasks and roles and to adapt to new situations [37]. In contrast, owners of mature businesses have a “track record,” routines and established practices they can refer to. Over the years, variables other than the owners' human capital may become more important.

Finally, the relationship between human capital and success is higher in less developed than in developed countries. In developing countries, human capital is more heterogeneous and scarcer than in highly developed countries. Therefore, human capital is more likely to create competitive advantage in the developing world. While it is obvious that the human capital is important for the success of NTBVs, the magnitude of this relationship can still vary. Recently, relevant studies introduce the mediating role of resource holders to explain the magnitude of this relationship [8].

Founders’ human capital and the alliance with a business group

Undeveloped markets follow unforeseen turns; hyped-up technologies disappear far more often than they engender promised technological shifts; technologies obsolesce extremely rapidly; and unanticipated kinks derail once-promising development projects [35]. For these reasons, new technology companies are extremely risky. Such uncertainty makes external resource holders hesitant to provide resources to NTBVs, so they have difficulty in obtaining the requisite resources in the markets [9]. Given this situation, signalling theory researchers propose that the human capital of founders play the role of signal to attract VC investment, hereby NTBVs that obtain VCs’ investment can make higher performance than otherwise [7,8,9]

In developed countries, where many of these institutions exist in relatively weak form, BGs control a substantial fraction of a country’s productive assets and account for the largest and most visible of the country’s firms. So they can contribute to innovation through intangible assets such as business reputation and government tie by substituting for functions that stand-alone institutions provide in developed countries [34]. In developing countries, NTBVs can obtain their requisite resources by collaborating with BGs.

BGs establish alliances with NTBVs, because in reality, technology innovation takes place more often in an alliance between BGs and NTBVs in industries which have high uncertainty [31]. NTBVs lack a business track record; resource holders have high uncertainty

in evaluating their potential capabilities. Therefore, BGs have a lot of uncertainty in evaluating NTBVs potential capabilities. This more recent work finds that the composition of a young firm's board and top management team can positively affect its ability to attract important stakeholders and to perform well in the marketplace [5,17].

Considering the level of education level as an indicator of cognitive propensity, studies with a cognitive perspective suggest that the level of education is positively related to the receptivity of innovation [38]. Based on this, studies of top management teams propose that the amount, but not the type, of formal education of a management team will be positively associated with innovation [2,15]. The bigger BGs get, the more bureaucratized and less innovative they become. So, in new technology sectors BGs need to supplement their innovative capabilities through NTBVs in the form of an alliance. Given this situation, the high educational level of founders of NTBVs can be a signal that the NTBVs have high innovative capabilities to BGs.

Hypothesis 1: NTBVs managed by founders with a high educational level are more likely to collaborate with BGs.

It is difficult to obtain the skills and knowledge in the field of information technology because the sector itself is at the initial stage of distribution of relevant information and knowledge. Also, there are very few top managers with relevant industry experience, so relevant industry experience of top managers can be a competitive asset that competitors cannot imitate, for they cannot be obtained easily in the market [4,21]. In new technology sectors, BGs want to obtain information and knowledge from NTBVs in the form of an alliance. For this, BGs should judge the NTBVs' specialty in the sector in order to make the alliance between BGs and NTBVs successful. However, it is very difficult for BGs to evaluate the specialty because NTBVs lack a track record. Given this situation, relevant industry experience of the founders of NTBVs can be a signal to BGs that the NTBVs have industry specialty that the BG lacks.

Hypothesis 2: NTBVs managed by founders with relevant industry experience are more likely to collaborate with BGs.

Functional backgrounds have been classified into three categories [19,26]. "Output" functions, that is, marketing, sales, and product R&D-emphasize growth and the search for new domain opportunities are responsible for monitoring and adjusting products and markets. "Throughput" functions, that is, production, process engineering, and accounting work at improving the efficiency of the transformation process. A third functional classification was law and finance which are not integrally involved with the organization's core activities [16].

New technology sectors face the challenges related to R&D and markets that should be solved in order to be competitive. BGs should learn problem solving capabilities from NTBVs in the form of an alliance in new technology sectors. For this, BGs would judge the problem solving capabilities of NTBVs in order to make the alliance between BGs and NTBVs successful. However, BGs have trouble in evaluating the problem solving abilities because of lack of track record of NTBVs. Given this situation, the output function background of founders of NTBVs can be a signal that the NTBVs have R&D or market problem solving abilities to BGs.

Hypothesis 3: NTBVs managed by founders with an output function background are more likely to collaborate with BGs.

The mediating role of the alliance with a business group

Relevant studies have two perspectives on ways that alliances with BGs facilitate the growth of NTBVs. First, through a strategic alliance, the large firm is the resource holder which provides resources to venture companies. Venture companies must take care of technology competitiveness and marketing factors to establish a market bridgehead. In line with this thinking, BGs that have strong brand and financial power can provide a sales route to NTBVs that have limited resources. BGs provide instructions for advancing and productivity, and sometimes even arrange funding for NTBVs [27,31]. This support from BGs has a positive effect on NTBVs' performance.

At the same time, strategic alliances between venture companies and BGs induce the resource supply from passive resource possessors and consequentially venture companies can replenish necessary resources and create good output. Since venture companies do not have enough of a record, the social structure of a business relationship can influence their business value. Therefore, it is very important that venture companies have a business relationship with a highly reputable partner since this is a very important factor for evaluating the possibility of success [40].

As we review the relevant literatures, the human capitals of founders would influence the growth of NTBVs and we suggest that they lure alliances with BGs. Furthermore, relevant studies maintain that BGs provide their tangible and intangible resources to NTBVs and induce passive resource holders to provide their resources, and so in turn NTBVs can acquire the necessary resources they need to perform well. Therefore, we raise the possibility of a link between the human capital characteristics of founders and the subsequent alliance formation with a business group, facilitating the growth of the NTBV.

***Hypothesis 4:** NTBVs managed by founders with a higher educational level can grow faster by collaborating with a business group.*

***Hypothesis 5:** NTBVs managed by founders with the relevant industry experience can grow faster by collaborating with a business group.*

***Hypothesis 6:** If NTBVs managed by founders with an output function background can grow faster by collaborating with a business group.*

Data and Methods

Data

The original target research sample consists of 1,253 KOSDAQ (Korea Securities Dealers Automated Quotation) stock market listed firms from July 1, 1996 to December 31, 2005. Data were collected from DART (Data Analysis, Retrieval and Transfer System), which is an electronic disclosure system that allows companies to submit disclosures online (www.dart.fss.or.kr). We supplemented the database with diverse approaches such as newspaper articles, publications, corporate homepages and phone calls to the firms.

To define our final sample for analysis, we had to consider changes in economic conditions at the turn of the century. We first limited samples to IT firms founded after 1990, because business ventures in Korea have developed as the IT industry has expanded quickly during 1990s [28]. The Korean government had consistently loosened the listing requirements for the KOSDAQ market to encourage the provision of listed firms from July 1996 when the KOSDAQ stock market opened.

But, by the early 2000s, the KOSDAQ market had collapsed. With rapid market readjustment, IT firms faced a dramatic drop in stock prices. Internet companies were hit hardest elsewhere. Moreover, market factors were aggravated due to insufficient restructuring, misdeeds of venture managers and unfair trading in the KOSDAQ market. With the overall

venture industry experiencing a dramatic shakeout, the government raised the registration standards for the KOSDAQ market [23]. The KOSDAQ market was under-valued from July 1, 1996 to late 1998 due to the so called “IMF financial crisis” and the bursting of the dot-com stock market bubble from early 1999 to the first half of 2000. Thus, we also limited samples to the firms which went public after July 1, 2000 to eliminate the unusual bias caused by these dramatic changes in market conditions. After eliminating firms of which the CEO is not a founder or a major shareholder, we came up with the final sample of 170 KOSDAQ-listed firms for analysis.

Variables

Strategic alliance with a BG. Korean commercial law defines about 900 firms with assets of over 2 trillion Won as a business group. More generally, they regard the 30 largest firms ranked by assets as so called ‘Chaebols’, announced by the Fair Trade Commission from 1995 to 2005. A strategic alliance with a BG includes supply agreements, joint R&D, share participation, and joint ventures. We define large companies as the 30 largest firms ranked by assets. This research defines a BG as an enterprise among the 30 largest firms as declared by the Fair Trade Commission. We use a binary variable to measure a strategic alliance with a BG that takes on the value of 1 if allied with BGs (strategic alliance with BG = 1) and 0 otherwise (no strategic alliance with BG = 0).

The growth of NTBVs. NTBVs exploit business opportunities with differentiated technology in areas of rapid technological change. NTBVs are under a higher level of uncertainty than existing firms, thus, they lack sufficient financial resources for R&D and marketing compared to existing firms. An IPO allows a firm to tap a wide pool of investors to provide it with capital for future growth, repayment of debt, and/or working capital. And once a firm is listed, they are able to enhance their reputation by introducing the firm’s value outside of the firm. But, IPO firms sometimes exhibit a decline in post-issue operating performance because there is potential for higher agency conflicts, lower ownership retention, and IPO expenses [11,18]. Despite these drawbacks, NTBVs have no choice but to implement IPOs as a crucial strategy and try to reduce the time required to IPO. Researchers thus adopt the IPO event as a measure for the rate of the NTBVs’ growth [6,33]. The time to IPO is measured by months since the date of founding. We take the logarithm of this variable for the adjustment of scale.

Human capital. A founder’s level of formal education is calculated based on a classification of the founder’s information according to two levels. The higher level is a master’s or doctorate degree. The lower level is an undergraduate degree or lower. The previous work experience takes on the value 1 if a founder has worked in a related industry before and 0 otherwise. The functional background takes on the value 1 if a founder’s undergraduate major or career experience is in output functions and 0 otherwise.

Control variables. Industry sub-type characteristics, Stock Market Conditions, Firm Size, Venture capital (VC) investment are controlled.

Results

The resulting of testing hypotheses

Table I shows the results of analyses. Hypotheses were tested with logistic regression and survival analysis.

Table I. Results of regression analyses

	Model 1 time to IPO	Model 2 alliance with BG	Model 3 time to IPO
Constants		-.873**	
Control variables			
IT S/W	-.152	.048	-.116
IT H/W			
Communications and broadcasting	.555	-.620	.337
KOSDAQ index	-.428		-1.424
Sales	-.905		-.016
VC investment	-.477*		-.439*
Independent variables			
High academic degree	.003	-.483	.021
Prior experience in a related industry	-.503**	1.155**	-.345*
Output functional background	-.692**	1.235**	-.477**
Mediating variable			
alliance with BG			-1.500**
-2Log Likelihood	1365.969	202.643	1303.574
Chi-square	49.003**		120.199**
Cox and Shell R ²		.176	

N = 170, /P/ < 0.05: *, /P/ < 0.01: **

Table I shows the results of logistic regression analyses. The interaction effect between related-industry experience of a founder and alliance with a BG is positively significant ($p < .01$), supporting Hypothesis 2. The relationship between the output functional background of a founder and the alliance with a BG is positively significant ($p < .01$), supporting Hypothesis 3. However, the level of education of a founder has no significant influence, failing to support Hypothesis 1. The alliance with a BG has a partial mediating effect on the relationship between related-industry experience and output functional background and time to IPO. Thus, Hypotheses 5 and 6 are supported.

Discussion and Conclusion

The core of our tested models can be recapitulated as follows: (1) founders' human capital influences the likelihood of an alliance with a BG; and (2) an alliance with a BG may have mediating effects on the relationship between founders' human capital and a firm's growth. Founders' prior work experience in a related industry and output functional background results in alliance with BG and superior NTBV growth whereas founders' academic background has no effect on the alliance with BG and firm's growth.

We contribute to theory and literature on entrepreneurship and strategy in developing economies by developing and testing a mediating model that provides an explanation of the NTBV performance relationship. From a signalling theory perspective, it is important to understand the resource providers which lure the third party resource holders as a linkage between founders' human capital and the NTBV growth in developing economies. This study found that founders' concrete knowledge or specific functional background is more influential on attracting an alliance with a BG than their abstract propensity. This study also investigates the mediating role of BGs for the growth of NTBVs in a developing country. Because there is market failure in developing countries, BGs provide various kinds of resources to NTBVs and play the role of a positive signal to other resource holders.

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