# Editorial

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Soo Hyun Nam is a Professor of Finance at Dong-Eui University, South Korea. He is also the Director of the central library at the university. He obtained his PhD from Seoul National University in 1991 and has published numerous articles and books in the area of insurance, banking, corporate governance and other financial issues. From 2006 to 2008, he also served as an Auditor for the Korea Technology Finance Corporation, a government financial institution for technology innovation within small and medium sized firms.

Papers presented in this special issue in one way or another help to enhance our understanding of technology transfer and valuation, an eye-catching topic in an up and coming field of technology marketing. The technology transfer these four papers discuss in this issue is analysed in both real and virtual environmental parameters. The title of this special issue therefore is 'Technology valuation, technology transfer and virtual governance'. It took a proliferation of efforts from us to compile the four papers on the topic, even as we thought it would attract wide readership internationally. Part of the reason for the time consuming nature of editing this issue was the chaotic world in which we are operating for international coordination toward high calibre intellectual work. Nonetheless, participants in this special issue showed consistency in producing and promoting high quality work in the area of technology valuation, transfer and governance, a field in which they have successfully contributed valuable additions to the extant literature in their own countries. The authors of the papers have published research results in the UK, Japan and South Korea, three vibrant nations of the world with an

outstanding track record of technology innovation. Technology marketing has been an incessant research theme that has captured the mind of laymen, professionals and researchers in the field, ever since the WTO passed the ground breaking resolution for intellectual property protection after the Uruguay Round in 1995.

The dominant theoretical penchant in technology marketing has emphasised the concept of 'bridging' to shed light on the nature of the networked or path dependent propagation of technology innovation between researchers and developers on the one hand and between developers and manufacturers/distributors on the other (see *inter alia*, Allen and Cohen, 1969; Allen et al., 1979; Tushman and Scanlan, 1981; Cohen and Levinthal, 1990; Hansen, 1999; Tsai, 2001; Burt, 2004). Bridging allows firms to access external sources of knowledge and information that would be otherwise unavailable within their own boundaries. This also allows firms to brood or incubate research and development ideas in the very external sources of knowledge and information they will harness later. Costly activities of research and development and incubation of immature ideas are carried out by others, while the future benefit of harnessing them is promised to those who nurture and exploit bridging opportunities. While noticing advantages of sourcing knowledge from cross-boundary interactions between corporate researchers and developers, writers of innovation have also searched for ways to ameliorate drawbacks of cross-boundary sourcing, which includes 'difficulties of transferring, integrating and leveraging heterogeneous inputs and diverging perspectives available across organisational boundaries' (Tortoriello and Krackhardt, forthcoming).

Among the difficulties associated with innovation through 'bridging' that defies organisational boundaries for the purpose of technology transfer and marketing are undertaking technology valuation (or calculating the future value of knowledge), finding appropriate target users (or calculating who will properly appreciate and realise the future value of knowledge) and governing the entire process of transfer, including patenting, marketing and contracting (or calculating which institution will best safeguard firms from catastrophic governance failures). The papers collected here for this special issue try to get to the bottom of the conundrum the above three broad categories of difficulties have created. Two of them also apply their theoretical discussion to the specific cases of South Korea and Japan.

The reason we decided to put these three broad theoretical issues together in one volume stems from the premise that none of the three types of difficulties associated with bridging can be dealt with separately with much success. Technology valuation, even if it was perfect, would not resolve the difficulties of finding target users and choosing governance structures. This is why technology valuation could be likened to a macroeconomic indicator that would restore the market equilibrium despite short-term disruptions but would not resolve microeconomic difficulties in making actual day-to-day managerial decisions. Finding target users (or customers) and improving governance mechanisms (or institutions) fall in the category of microeconomic activities that firms must plan out carefully before taking any action. In a similar vein, resolving the problem of finding target users would not solidify long-term deals of technology transfer, unless technology valuation was preceded by such a commercial transaction. Key to the success of technology marketing in real and virtual environments is therefore the art of combining solutions to both macro- and microeconomic uncertainties, much akin to the successful marketing of other service- or information-oriented commodities.

Two papers are presented in this volume on the microeconomic nature of technology marketing that defies boundaries – namely, the corporate governance of virtual

technology marketing and targeting desirable end users for the specific technology developed by university researchers and which is on sale in the market in the form of licensing. In the paper on governance Oh provides readers with a preliminary discussion of boundary defying technology marketing, especially in virtual parameters. His main concern is how unsuspecting technology traders can benefit from pure virtual technology marketing or what others argue could be the worst nightmare in international technology transfer. Given the cost efficiency of virtual trading in most cross-boundary transactions, Oh argues that motivation and opportunity structures, springing from cost concerns, shape the fount for virtual technology marketing, while the absence of social networks within the virtual markets reinforces the need for systemic governance of virtual transactions.

Preoccupied with the superiority of social networks, firms often pass up opportunities of disconnected business transactions in the virtual space. Consistent with the assumption widely shared by researchers and practitioners in the field of cross-boundary and virtual transactions, Oh's paper dubs firms' boundaries and fixation with networks as unnecessary trammels to innovative individuals, groups and firms. Using normative isomorphism as an ideal upshot of disconnected virtual marketing for technological innovation, the paper emphasises the power of professionals who can overcome the governance problem within the realm of virtual technology marketing by gathering valuation data for new technologies, patenting new knowledge with global legal authorities and marketing them in the disconnected virtual markets. Technology valuation, patent trolls and normative isomorphism therefore do not desecrate individual, group or firms' innovative efforts.

Yoneyama et al. put their finger on licensing, a mode of entry many researchers and practitioners have avoided for possible infringement of patent rights and the possible breeding of future business rivalries despite its gained popularity during the post-war era. Uncertainty would increase over the potential knowledge spill-over, unaccounted for by the gullible licensor, if licensing were entered into between disconnected partners without professional intermediation. The authors indeed define licensing as 'marketing activity', unsurpassed by other modes of entry or marketing activities in terms of cost saving. What virtual technology marketing is to boundary-defying firms in terms of cost cutting, licensing is to technology licensing organisations (or TLOs) in terms of survival. One of the famous cases of licensing success is probably Matsushita's triumphant entry into the US VHS market through a licensing deal with Philips USA. Scholars in the field thus contrast Matsushita's success to SONY's failure, which had inadvertently made futile and costly attempts at holding on to its unrivalled position in the US market through its sole ownership of Beta VCR machines without fostering any allies who might have rescued SONY's pioneering VCR technology from being outmoded by competitors, if SONY had licensed its technology out to potential allies.

The palatable nature of technology spill-over for many licensees in the emerging economies helps firms to expand their boundaries in the international markets, even as the inadvertent upshot of the licensing deal would lead to heated competition between former licensing partners in the same market. An infamous example is Matsushita's domination over and ultimate amalgamation of RCA after a successful licensing deal over the transistor technology RCA developed and transferred to Matsushita. Yoneyama et al. argue that the double edged uncertainty of licensing qua marketing activity – the failure to license new technologies to right partners and the failure to curb licensees from

ripping the benefit of technology piracy – can be neutralised by sharing information between licensing partners about technology valuation at an early stage of research and development. This would sow trust between the two licensing allies, concomitantly slackening the sharp learning curve due to the tacit nature of new technology. This conclusion rests on the two assumptions that technology valuation shall precede all important decisions the licensing allies have to make in sequence and that the tacit nature of new technology will determine the degree of trust required in the entire knowledge transfer process.

The remaining two papers deal with our macroeconomic concern in technology marketing – valuation of new technologies. Seol reckons that forecasting the future value of new technological innovation has seldom been welcomed by innovation practitioners or technology marketers. Conceived as either erroneous or deceptive, the forecast value of new technological innovation by independent agents often hampers smooth transfers of the technology, stopping short of satisfying the ultimate desire of technology traders. Rival valuation methods further exacerbate the good intentions of technology marketing by injecting uncertainty into the forecasts about the future outcome of new technologies. Seol argues that upending the casino nature of value forecasting requires professional expertise, which needs to be distinguished from simple accounting knowledge taken for granted in the valuation of tangible assets. Similar to Yoneyama's et al. assumption that the intangible nature of technology sows confusion and mistrust among licensing allies, Seol admits that the valuation of intellectual property is different from that of tangible goods, whose value is expressed in market prices. Therefore, technology valuation is reliable and legitimate to market traders only when professionals in the field uphold their valuation standards that are not only consistent from one piece of intellectual property to another, but are highly cherished among professionals as a fair and objective representation of all intangible assets. This conclusion is shared by Oh, in that he places a unique emphasis on normative isomorphism and professionalism.

The controversial nature of valuation professionals, however, creates an institutional stalemate between professional contestants, as Seol notes that court officials often overrule the result of valuation clinically assessed and prepared by valuation specialists. This is the reason the real and forecast value of new technologies often diverges, and the whole situation has to be re-evaluated carefully at the face of governance or institutional malfunctions, including market failures. At the macroeconomic level therefore the final determination of valuation has to be fought out amongst professional bodies, including the court officials. The escalation of technology valuation into court litigations among stakeholders, which awaits a macroeconomic verdict on the final value of new technology, derives from microeconomic contestation over value sharing between innovation partners (e.g., strategic partners) and innovation drivers (e.g., types of technology, market size, organisation, key people and earning potential). Thorny as it seems, a large pool of risk bearers and innovation drivers further complicates the plight of the technology valuation and marketing deal, awaiting systematic scholarly investigation into the matters of governance, trust and valuation.

In the last paper of this special issue, Park and Kim shift the attention to the forecasting of future aggregate demands of new technologies, which seems more manageable to the researchers and practitioners in the field than devising a unified model for valuation of technology. They come up with a mathematical model that they suggest would help firms to make an informed decision about the quantity of the new technology they will develop and eventually supply to the market, as the model will accurately

estimate the future demands of the new technology. Demand estimation in this fashion is called for as the technology market is now globalised and has become much more competitive than before due to the increased number of technology suppliers and marketers coming from all corners of the world in tandem with tightened intellectual property protection. The overarching theme of Park and Kim's paper is to resolve the quandary most innovative firms have encountered in attracting investors into a new innovation programme, balancing the speed of reaching each output milestone and ultimately deciding the final output quantities that will be shipped to the market. Previously, demand estimation required market data compilation based on earlier versions of the related technology released in the market. Park and Kim's model, however, renders this prerequisite no longer necessary for forecasting and enables firms to obtain estimates of new technologies that are completely unrelated to the extant versions, prohibiting firms from collecting market data.

Park and Kim propose to use an extended version of the Kalish model that utilises a conjoint analysis in the estimation of future demands for a specific new technology. Their proposed model addresses the dispositional factors of a product (e.g., attributes information, prices, brand equity and product characteristics) as well as the situational factors (e.g., choice risks), all in a conjoint analysis. This model is then tested against the Korean asymmetric digital subscriber line (ADSL) data along with other competing valuation models previously devised by various specialists in the field. The result was an astonishing one in that their proposed model fared better than that of rivals at least in the realm of the Korean ADSL market, even as it lacked previous demand data in its estimation. The authors therefore could forecast the future demands of a specific technology only by attribute values and perception without having to obtain actual sales data, giving empirical grounds to such claims as demand forecasting based on market surveys can be valid to some degree, despite uncertainties. These empirical findings support one of our overall working hypotheses of this special issue that cross-boundary bridging even in the virtual parameters can generate desired innovation results, as far as the professional community can provide these striving firms with advanced estimation skills for demand and value forecasting.

At the end of the articles, we decided to add two case studies that we created based on our fieldwork in South Korea. Both cases deal with virtual technology marketing, as the first one involves an R&D outsourcing agreement between SK Pharm, a South Korean pharmaceutical giant, and a pharmaceutical researcher in the USA; and the second case study deals with a virtual technology marketing, or another R&D outsourcing agreement between Jusung engineering, a small and medium semiconductor tool manufacturing firm in South Korea and a professor at Korea Advanced Institute of Science and Technology in the same country. These two success cases of virtual technology marketing will serve as our illustrative cases in reading the theoretical papers presented here.

The current volume is an outgrowth of valuable input and assistance from various colleagues and associates of ours currently working in the field. Éric Viardot and Alexander Brem, editors of the *International Journal of Technology Marketing*, supported our aim to bring together recent research results in technology marketing, a relatively new scholarly forum where researchers and practitioners can cooperate more routinely than in other similar forums that are predominantly theoretical. All the papers presented in the issue have undergone stringent peer reviews, and the editors express our gratitude to those who volunteered to carry out what others think

could be one of the most onerous intellectual tasks that bear no fruit of material recompense. Dr. Kyung-Mo Song, Vice President of Korea Valuation Association (http://www.valuation.or.kr), is a living expert in technology valuation in his own country and happily agreed to review one paper in this collection. Along with Professor Mohammed Saad at Bristol Business School, a leading specialist in technology transfer in the UK, Dr. Ramdane Djebarni, Senior Lecturer at the Business School of the University of Glamorgan, Cardiff, who has actively published work in project management, and Dr. Jason Wang at the University of East Anglia, participated in the review panel for this special issue from the English side. Professor Jae Bum Hong at Pukyong National University, Professor Hong-Hee Lee at Dankook University and Prof. Soongoo Hong at Dong-A University, top notch scholars of technology transfer in South Korea, happily shared their valuable time and expertise with us toward the completion of this special issue. Finally, Dr. Koichi Hasegawa, Fellow at the National Institute of Science and Technology Policy (NISTEP) within the Ministry of Education, Culture, Sports, Science and Technology, graciously joined our review team from the Japanese side. Editors of this volume once again pay our tribute to these fellow scholars for their precious contribution to this truly international collaboration.

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