The 23rd SJE International Symposium

"Firms and Innovation in Asia"

Co-hosted by:
Institute of Economic Research, SNU
BK21+ Program in Economics, SNU
Center for Distributive Justice, SNU
SSK Research Unit for Firm Dynamics, IPRs, and Innovation

Place: Faculty Meeting Room (Room 312, Bldg. 16, College of Social Science 3rd Floor)

Friday, October 30

9:00 a.m. Registration
9:20 a.m.-9:30 a.m. Opening (Keun Lee, Director, Institute of Economic Research, SNU)
Welcoming Remarks by Prof. Hak K. Pyo (Former editor of SJE; Professor Emeritus, SNU)

9:30 a.m.-11:00 a.m. Opening Session (Chair: Prof. Jungsoo Park, Sogang University)

Lakhwinder Singh (Prof., Punjabi University, India) and Anita Gill (Prof., Punjabi University, India)
Emergence of Innovative Manufacturing Firms across Asian Countries

Keun Lee (Prof., Seoul National University)
Comparative Perspectives on Business groups in Korea, Japan, and China

--Discussants: Djun Kil Kim (Prof., University of Asia & the Pacific, Philippines)
Hyeog Ug Kwon (Prof., Nihon University, Japan)

11:00 a.m.-11:20 a.m. Coffee Break

Session 1A 11:20 a.m.-12:50 p.m. (Chair: Prof. Jinyoung Kim, Korea University)

Kyoji Fukao (Prof., Hitotsubashi University) and Hyeog Ug Kwon (Prof., Nihon University)
International Competitiveness: A Comparison of the Manufacturing Sector in Korea and Japan
--Discussants: Jung-Wook Kim (Prof., Seoul National University)
Kyoo-Ho Park (Prof., Hanshin University)

Hyunbae Chun (Prof., Sogang University)
Can the Property Rights Theory Explain Cross-Border Vertical Integration of Multinational Firms? Firm-level Evidence in Korea
--Discussant: Jooyoung Kwak (Prof., Yonsei University)

12:50 p.m.-2:00 p.m. Lunch (Provided in the room)

Session 1B 2:00 p.m.-3:30 p.m. (Chair: Prof. Kyoji Fukao, Hitotsubashi University)

Junbyoung Oh (Prof., Inha University)
Financial Market Reaction and Prediction in Patent Litigations: A case study for South Korea
--Discussant: Wonkyu Shin, (Dr., Seoul National University)

Kineung Choo (Prof., Korea Naval Academy)
Academic Advisors and their Ex-graduate Students: A Channel of Knowledge Diffusion

--Discussant: Tae Young Park (Prof., Hanyang University)

3:30 p.m.-3:50 p.m. Coffee Break

Session 1C 3:50 p.m.-5:20 p.m. (Chair: Prof. Chongmin Kim, Kookmin University)

Kazuyuki Motohashi (Prof., The University of Tokyo)
Innovation and Entrepreneurship: A first look at linkage data of Japanese patent and enterprise census
--Discussant: Taehyun Jung (Prof., Hanyang University)

Jisun Lim (Ph.D. Candidate, Seoul National University)
Does innovation create jobs: Evidence from the Korean Industry
-- Discussant: Young Hoon Lee (Prof., Sogang University)

6:00 p.m. Dinner (Participants only)

Saturday, October 31

Session 2A 9:00 a.m.-10:25 a.m. (Chair: Dr. Seong-Jae Cho, Korea Labor Institute (KLI))

Takahiro Fujimoto (Prof., University of Tokyo)
Design-Flow-Based Concept of Manufacturing: Capability, Architecture, and Competitiveness
-- Discussant: Jong-Hak Eun (Prof., Kookmin University)
James Jung (Grad. Student, SNU)

Hyuntai Lee (Dr., Korea Institute International Economic Policy (KIEP))
Causes for Changing Performance of Ownerships in China
--Discussants: Sungho Rho (Prof., Sejong University)
Sun Ok Kim (Ph.D. Candidate, Sogang University)

10:25 a.m.-10:45 a.m. Coffee Break

Session 2B 10:45 a.m.-12:45 p.m. (Chair: Prof. Jeong-Dong Lee, Seoul National University)

Tsutomu Miyagawa (Prof., Gakushuin University)
Is Productivity Growth Correlated with Improvements in Management Quality? An empirical study using interview surveys in Korea and Japan
--Discussant: Min-Jung Kim (Dr., Sogang University)

Sung Wook Joh (Prof., Seoul National University) and Jin-Young Jung (Prof., Inha University)
When Are Friendly Outside Directors Beneficial to Firms?
--Discussants: Janghee Cho (Prof., Jeju National University)
Hyoseok Kim (graduate Student, Seoul National University)

Shanji Xin (Ph.D. Student, Seoul National University)
Contribution to Economic Growth by Different Sized firms in China
--Discussants: Raeyoon Kang (Ph.D. Candidate, Seoul National University)

12:45 p.m. Closing

1:00 p.m. Lunch (Venue: Room "Dam," Sodam-maru, Dongwon-gwan (Bldg. 113) 3rd Floor)

Emergence of Innovative Manufacturing Firms across Asian Countries

Lakhwinder Singh and Anita Gill

Emergence of Innovative Manufacturing Firms across Asian Countries

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October 2015

I. Introduction

The economic development experience of the global economy during the last three decades has underlined a dramatic shift of the sources of economic expansion from western developed countries to the Asian continent. The economic influence of Asian economies has been increasingly becoming stronger. The outward foreign direct investment flows from Asia has increased to US$ 383 billion in 2014, which are 31.9 per cent of the total outflow in the global economy and were higher than both of Europe and North America (23.3 per cent and 28.8 per cent respectively) (UNCTAD 2015:30). Asian economies contributed 38 per cent of the world GDP, 32.9 per cent of world exports and 32.6 per cent of the world's manufacturing value added in 2010 (Nayyar 2013). The sustained rise in the contribution of Asian economies to the world economy provides it the status of the 'engine of growth' of the global economy.

Asian economies, during the period of last three decades, have also undergone dynamic economic transformation. The structural change in the composition of output clearly brings out the increasing importance of industrial production- it was 41.3 per cent of GDP in 2010 (Nayyar 2013:103). Among the top ten most competitive industrial economies of the world, five are from the East and Pacific countries (Japan, South Korea, Taiwan, Singapore and China). The other East Asian countries that fall in the list of top 50 most competitive industrial economies of the world are Malaysia, Thailand, Indonesia, Philippines, and India from the South Asian countries (UNIDO 2013:ix-xii). The presence and influence of the Asian firms (Multinational corporations from Asia) in the global market is so significant that Forbes and Fortune Global 500 list includes and ranks these companies. The 2015 Fortune Global 500 list includes 98 companies from China, 54 from Japan, 17 from South Korea and 7 from India. The total number of Asian MNCs in the Fortune Global 500 list is more than 172 (Cui, Chan and Zhang 2014).

The increasing role played by the Asian countries and their firms in shaping the destiny of the global economy has attracted the attention of a large number of scholars and global institutions to explore the underlined factors of this explosion of economic growth and transformation (World Bank 1993; Young 1993; Kim and Lau 1994; Krugman 1994). The most important source of rapid economic growth of the newly industrializing East Asian countries (Hong Kong, Singapore, South Korea and Taiwan) was capital accumulation, in contrast with the advanced industrialized countries where technological progress played a dominant role. This was also recently reaffirmed by Bosworth and Collins (2014) while using long term estimates of

sources of growth across Pacific Rim countries covering the period 1960-2008. From East Asia, China has remained the only exception to this rule where technological progress (total factor productivity) as a source of growth remained higher than the capital accumulation (Bosworth and Collins 2014: 187). However, in the post financial crisis of 1997-98, the sources of growth in most of the East Asian countries turns out to be predominantly technological progress, except for Taiwan.

On the other side, a large number of scholars who have examined the East Asian newly industrializing economies following the capability approach argued that each country has a significant number of industrial firms which acquired technological capabilities to produce technologically complex products, and are competing very successfully with the firms from industrially advanced countries (Kim and Nelson 2000). Furthermore, the catch up literature following the evolutionary and systems of innovation learning approach has argued that unique short cycle technologies specialization which emerged from the East Asian country firms allowed South Korea and Taiwan to pass through the so called middle income trap (Lee 2013). There is an increasing tendency of scholars to examine specific category of manufacturing firms while selecting small sample of firms/companies from Asian countries and arrive at conclusions regarding the innovations as an important factor in the rise of manufacturing firms (Li and Cantwell 2012; Kale 2012; Rasiah 2012; Lee and Mathews 2012; Liu 2014; Rho, Lee and Kim 2015). The firm level innovation studies are mostly based either on case studies or on using thin sample and therefore lack generalization.

The present study, based on a large country wide sample survey, which is comprehensive in coverage and scope, of manufacturing firms conducted across Asian countries and made available by UNESCO (2015), strives to fill this gap. This paper attempts to provide empirical evidence of manufacturing innovations across Asian firms while using the systems of innovation approach. It seeks to answer the question of extent of innovations, sources of innovations, factors barriers to active innovative and non-innovative firms, and interaction of innovative firms with institutional and non institutional organizations. The paper is organized in the six sections. The section two followed by introduction examines the theory of growth of the firm as well as empirical studies to identify the gaps for research. The variations in innovations across manufacturing firms of Asian countries are presented in the section three. In section four, the sources of innovations of manufacturing firms of Asian countries are examined. The analysis of

the barriers faced by the innovative and non-innovative firms across Asian countries is presented in section five. Concluding remarks are presented in the sixth section.

II. The Rise of Asian Firms: Theory and Empirical Review of Literature

As the evolution of global economy is taking place, there is emergence of Asian firms as global players in both capturing markets and innovation domains. The emergence of Asian firms seems to have benefited in forming capabilities from the import substitution regime to internationalization of business during the recent phase of globalization (Amann and Cantwall 2012). This transition needs to unravel the underlined processes and to do this one can take recourse to economic theory of the firm. There are three broad strands of theoretical literature that throw light on the growth of the firm. The mainstream theory of the firm is associated with the names of Coase (1937) and Williamson (1975, 1985). This theory considers firms as 'islands of conscious power' in a sea of markets transactions. An important feature of this kind of thinking is that firms insulate from market transactions because the price mechanism for allocating resources is costly both to establish and use as well as several transactions underline commitment in uncertain future. The internalization of transactions generates economies of scale and thus size of the firm expands so long as it reaps the economies of scale. However, diseconomies of scale from over-internalization will restrict the size of the firm. The central emphasis of this theory is on the cost of making and monitoring transactions. Despite the fact that Williamson emphasized the distinction between markets and hierarchies, but the Coase-Williamson tradition can be summarized as transactions costs approach since it has stressed on the costs of formulating, enforcing and monitoring contracts. This tradition has reformulated the question of production of more resources to the question of allocation of given resources and emphasized on different governance modes to minimize transactions costs given the technology (Hodgson 1998).

In contrast to the contractual theories of the firm, the evolutionary and capability/ learning based theories of the firm claim that they provide better ways to understanding technological and organizational change for the growth of the firm. A sound foundation to the evolutionary-capability-learning approach has been provided, in their seminal contribution, by Nelson and Winter (1982), and Freeman (1987) and Lundval (1992) further connected it to the national innovation system (NIS) approach. The roots of this approach can be traced in Smith (1776) who argued that expansion of the firm can take place through division of labour which

leads to specialization and enhancement of skills (capabilities) through learning-by-doing. Knight (1921) extended the scope of capability based theory of the firm while explicitly stating the role of knowledge and uncertainty in the existence and growth of firms. Penrose (1959) also has emphasized on the role of tacit knowledge and elusive nature of skills within the firm. She has incorporated the dynamics of tacit knowledge and a set of other capabilities as the core of her theory of the growth of the firm. Nelson and Winter successfully identified technical routines for producing goods by the firm and assigned the role of these routines that genes play in the biological evolutionary theory. They have emphasized that routines act as durable repositories of knowledge and skills and have a capacity to be replicated and further developed through searching and investing in innovative activities. The national system of innovation approach in which economic agents of production interact to acquire, create, diffuse and utilize knowledge for expansion has emphasized on building the innovative and learning capabilities and also treat it as path dependent. Therefore, the evolutionary-capability-learning based theory of the firm paid more attention to the processes of learning and development within organizations.

The theory of the growth of the firm outlined above does not throw much light on the question as to when and why internationalization of the firms occurs. The theoretical foundations in this direction were provided by Dunning's eclectic theory (1980, 2001) among others (Vernon 1966: Johanson and Vahlne 1977). Based on advanced country firms experience of internationalization, Dunning's OLI theory focuses on the exploitation of unique competitive advantage possessed by the firms from their existing firm specific assets. Further extending this argument (Dunning and Narula 1996), they have identified three motives on the internationalization of the firm as efficiency seeking, market seeking and strategic asset seeking.

This kind of theoretical foundations triggered empirical literature to verify the underlined causes of internationalization of firms from the emerging markets economies of East Asia and other developing countries. The recent spurt of outward orientation of the firms from the Asian countries, especially China and India and their investment in industrially advanced countries has prodded the economists to examine the underlined causes. It is a widely accepted fact that there are numerous factors that induce a firm to invest abroad. But acquiring strategic assets and innovation capabilities have emerged as the most dominant ones (Gill 2014; Gill and Singh 2012; Nayyar 2008; Mathews 2006). The limitation of such studies is that these studies have only examined one dimension, that is, outward orientation mainly based on investment.

However, before outward orientation of firms from the emerging economies, there was a deep inward internationalization, that is, multinational corporations' (MNCs) investment in the emerging economies. Most of the Asian countries except South Korea have had a long experience of learning from the interaction with the advanced industrialized country MNCs through joint ventures, technology licensing and technology purchase. The empirical studies that recognize both internal and external internationalization of Asian firms have followed the systems of innovation approach and identified the role of evolution of innovative capability building in the firms through global interaction (Amann and Cantwell 2012) are relatively very recent.

Li and Cantwall (2012) have examined foreign direct investment and innovation capability building in China. They have collected information from 51 international joint ventures (IJVs) regarding knowledge acquisition and their success in generating innovation capabilities. The authors found from this empirical investigation that all the sampled IJVs have been able to produce at a higher level of efficiency and replicate production of products along with remaining substantially successful in advanced innovative capability building. This success was essentially attributed by Li and Cantwall to the Chinese FDI policy imposing an important condition on MNCs to transfer technology of the most sophisticated kind to Chinese firms. Complementary to this, four auto manufacturing firms examined by Xu and Li (2014) bring out the fact that there exists a different path of state owned enterprises (SOEs) and private owned enterprises (POEs) in terms of building innovative capabilities. They have confirmed the findings of Li and Cantwall so far as SOEs are concerned but POEs have carved out an alternative path to innovations while imitating the domestic mature technologies. This was achieved through in-house accumulation of research and development expenditure.

The two highly successful countries in transforming firms from imitation to innovative are South Korea and Taiwan. Lee and Mathews (2012) have examined the process that leads to sustained catch-up of firms of these two countries. The sustained catch-up is defined as a continuous upgrading in the same industry and also entry of same and new firms into new and promising industries. For this process to be successful, the firms needs to design capabilities for product differentiation and product innovations that cannot be acquired either through networking or through international subcontracting. Rather it requires either cross-subsidization of huge amount of R&D or promoting R&D consortia with the help of public research

institutions (PRI). It is emphasized by the authors that South Korean firms relied on the first but Taiwanese firms used the latter route. However, reaching to frontier areas of knowledge and innovations, the successful innovative firms from both the countries employed multiple channels, but most important underlined by the authors are radical break on the basis of decisive investment and shared risks through forming consortias, entry into new industries by the established/networked firms and using the window of opportunity provided both by industry cycle and technological paradigm shifts. An important policy lesson that emerged from the case study is that in the successful and sustained process of catch-up of firms, the crucial element is government support.

The arrival of Indian firms in the international scene may essentially be attributed to long drawn technological capabilities while using the inward and outward internationalization of business. On the basis of examining two manufacturing sector firms-automobiles and pharmaceuticals, Kale (2012) argued that import substitution regime along with government support allowed to build technological capabilities in these two sectors. It is important to note that even during the import substitution regime, government of India allowed selective participation of multinational corporations and this interaction has made learning affects. Collaboration and competition in domestic market has promoted firm level learning capabilities. The outward expansion of firms in the liberal environment allowed firms to acquire strategic assets, foothold in international market and access to advanced technology. However, the author noted from the case study of two Indian manufacturing sector firms that accumulation of knowledge and development of knowledge is the deliberate effort of the firms to invest in several mechanisms of learning.

The brief review of theory of the growth of firms and empirical evidence brings home the fact that growth and internationalization of firms is a complex and multidimensional phenomenon. An important direction that emerged from the analysis is that the firms function in an institutional arrangement and environment which is dynamic. The successful transition of firms from imitation to innovation capabilities requires co-evolution of actors (firms) and its environment. However, a significant conclusion that emerges from the case study approach is that the state and public research institutions play an important role in this transition of firms in terms of providing right kind of environment and requisite resources to mitigate risks arising on this path of innovative capability building. One may also bring out the limitations of case study

based on empirical evidence. An important limitation of such kind of analysis is the well known selection bias. In this case most of the studies picked up a winner to prove their point, however, there are various firms either in the same product line or in different manufacturing industries that might not have been successful in building capabilities in the areas of innovations. Therefore, there arises a gap in our understanding of the actual transition of the manufacturing system as a whole. This study strives to fill this gap in literature while using a comprehensive survey of manufacturing firms both innovative and non innovative, and also use a comparative framework to provide a wider picture of the situation of the Asian firms.

III. Variations in Innovations across Manufacturing Firms in Asian Countries

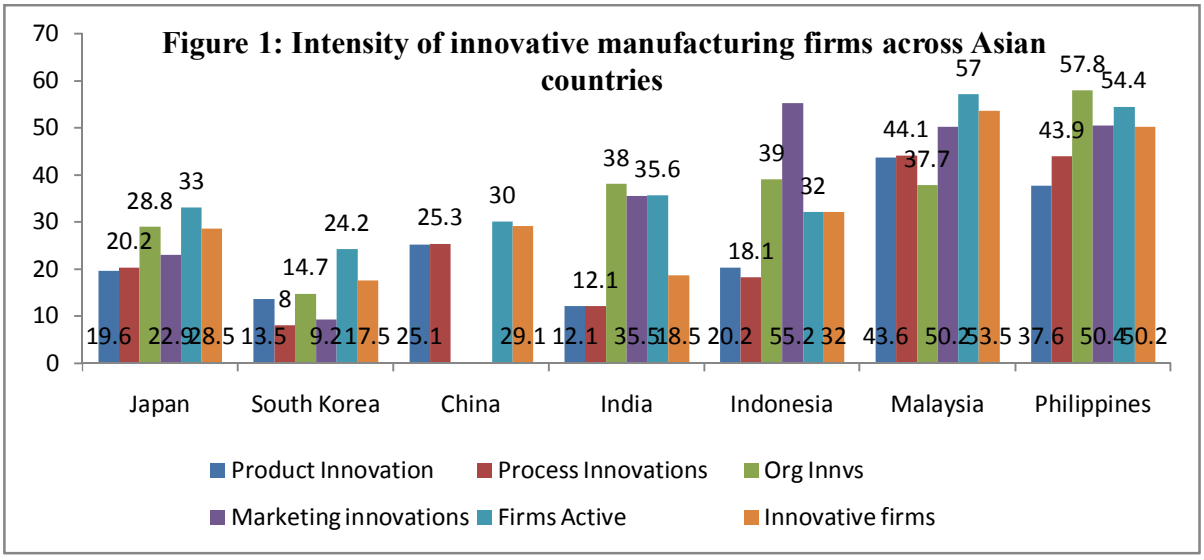
The concept of innovation has undergone dramatic changes. It has been becoming increasingly more inclusive. Between the period 1960s and 1980s only product and process innovations had been considered as the techno-physical components of the manufacturing systems of innovations (Bell and Figueiredo 2012). The social innovations have recently been recognized as important components of innovations because it contains social technologies such as forms of division of labour and modes of coordination (Nelson and Sampat 2001). Therefore, in the empirical analysis, four types of innovations, that is, product, process, organizational and market innovations are included. The variations in innovations producing Asian firms regarding these four types of innovation categories are presented in Table 1 and through Figure 1. So far as introduction of product innovations are concerned, the proportion of Malaysian firms have reported highest innovations as compared with other Asian countries followed by Philippines, China, Indonesia, Japan and Korea. An important fact revealed from the analysis of the product innovations, based on a sample of 9001 manufacturing firms spread over to various product lines, is that the proportion of Indian firms introducing at least one product innovation is the lowest. The value of the estimated coefficient of variation is 48.64 per cent and shows wide variation in the category of product innovations across Asian country firms. An important fact that can be inferred from the analysis of process innovations introduced by the Asian country firms (Table 1) is that firms of two countries, that is, Malaysia and Philippines, have highest number of firms engaged in product innovations. South Korea has been having lowest proportion of firms engaged in process innovations. The surprising evidence in the case of India is that the process innovations implemented by the firms are quite low. India, in fact, is known for specializing in process innovations prior to the change in from process innovation patenting

regime to product patenting regime. However, the coefficient of variation of process innovative firms shows higher value than that of the product innovations. Social innovations, especially of organizational innovations, clearly show higher intensity across all the countries under consideration except Malaysia. Similar trends can be observed in the case of marketing innovations. When we compare the coefficients of variation between organizational innovations and marketing innovations, and both categories of social innovations, the variations in the case of organizational innovations are lower compared with the marketing innovations. Furthermore, the analysis of the proportion of active innovative firms reveals that across the seven Asian countries, there is a high degree of participation of firms to engage in both product or process innovations. The value of coefficient of variation is 33.11 per cent which shows that the variations across this group of firms are quite small. It means that participation of Asian firms in implementation of product/process or abandoned or ongoing innovation activities to develop product or process innovations is stable and rising.

Table 1: Intensity of innovative manufacturing firms across Asian countries (figures in percentages)

Country	Product Innovation	Process Innovations	Organizational Innovations	Marketing innovations	Active Innovative Firms	Innovative firms	Per capita income US$PPP 2012
Japan	19.6	20.2	28.8	22.9	33	28.5	32545
South Korea	13.5	8	14.7	9.2	24.2	17.5	28231
China	25.1	25.3			30	29.1	7945
India	12.1	12.1	38	35.5	35.6	18.5	3285
Indonesia	20.2	18.1	39	55.2	32	32	4154
Malaysia	43.6	44.1	37.7	50.2	57	53.5	13676
Philippines	37.6	43.9	57.8	50.4	54.4	50.2	3752
Average	24.53	24.53	36.00	37.23	38.03	32.76	13369.71
Standard Deviation	11.93	14.41	14.12	18.21	12.59	14.16	12228.40
Coefficient of Variation	48.64	58.76	39.22	48.92	33.11	43.22	91.46

Source: UNESCO (2015).



The relationship between innovative activity and the level of economic development approximated by per capita income of the seven Asian countries can be inferred from the data presented in Table 1 and Figure 2. This relationship, known as 'catch up', reflects the movement upwards for the innovation intensity. The analysis of figure 2 allows us to conclude that there is a trend towards catch up. The innovation intensity measured through active innovation firms and per capita income gives the coefficient of elasticity -0.11. The line figure shows that lower level of development encourages firms to implement product and process innovations. Therefore, the number of active innovative firms increases. But once a country is developed, the introduction of entirely new to the world innovations requires higher level of risky R&D expenditure. This empirical finding is also confirmed when we enlarge the scope to 21 developing countries. The value of the elasticity of the coefficient between the share of product innovative firms and per capita income is -0.0335. In this sample five Asian countries are included. Figure 3 presents this relationship and allows us to conclude that the direction for catch up is pretty clear. Contrary to this, the relationship between the proportion of firms implementing product innovations and per capita income of the developed countries is positive and significant (Figure 4). The value of the elasticity of this relationship is 0.7867 and r-squared is 0.41. Thus the incidence of innovative intensity rises more or less in line with per capita income. These kinds of trends are also noted in other studies as well (Bell and Figueiredo 2012:38-39).

Figure 2 :Relationship between share of innovative active firms and per capita income across Asian countries

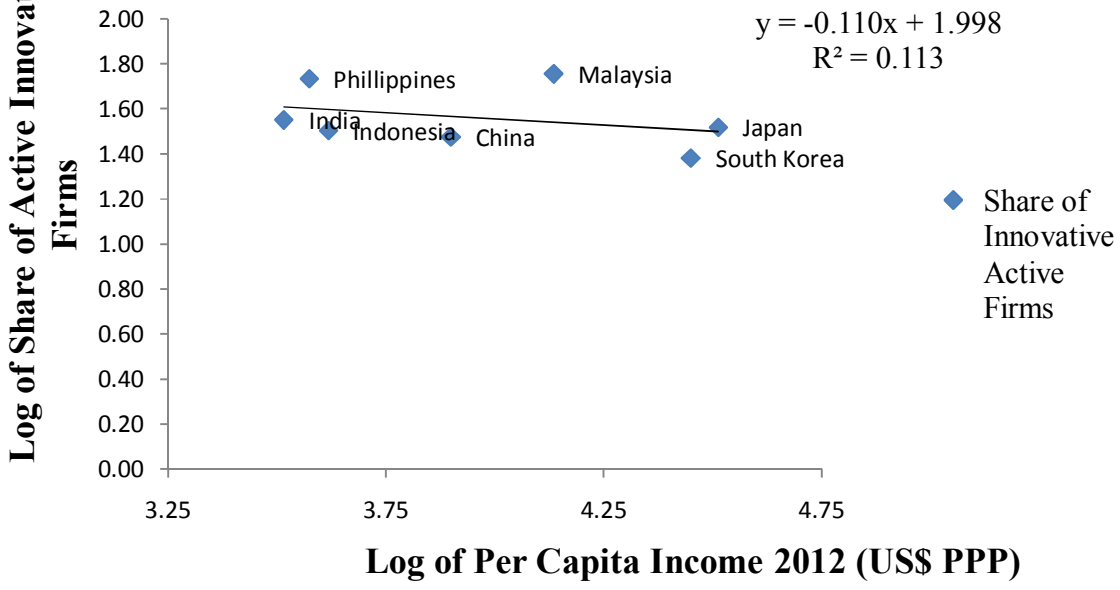


Figure 3: Relationship between share of product innnovators and per capita income across developing countries

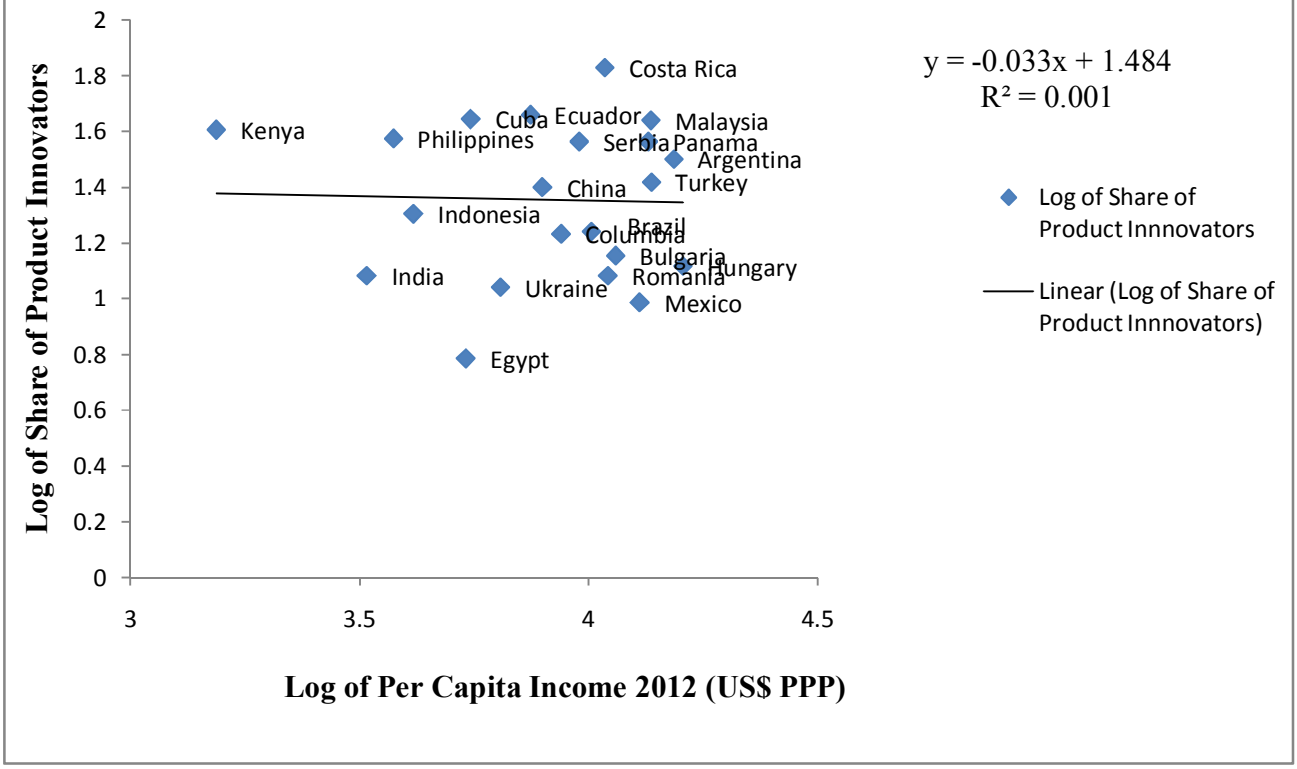
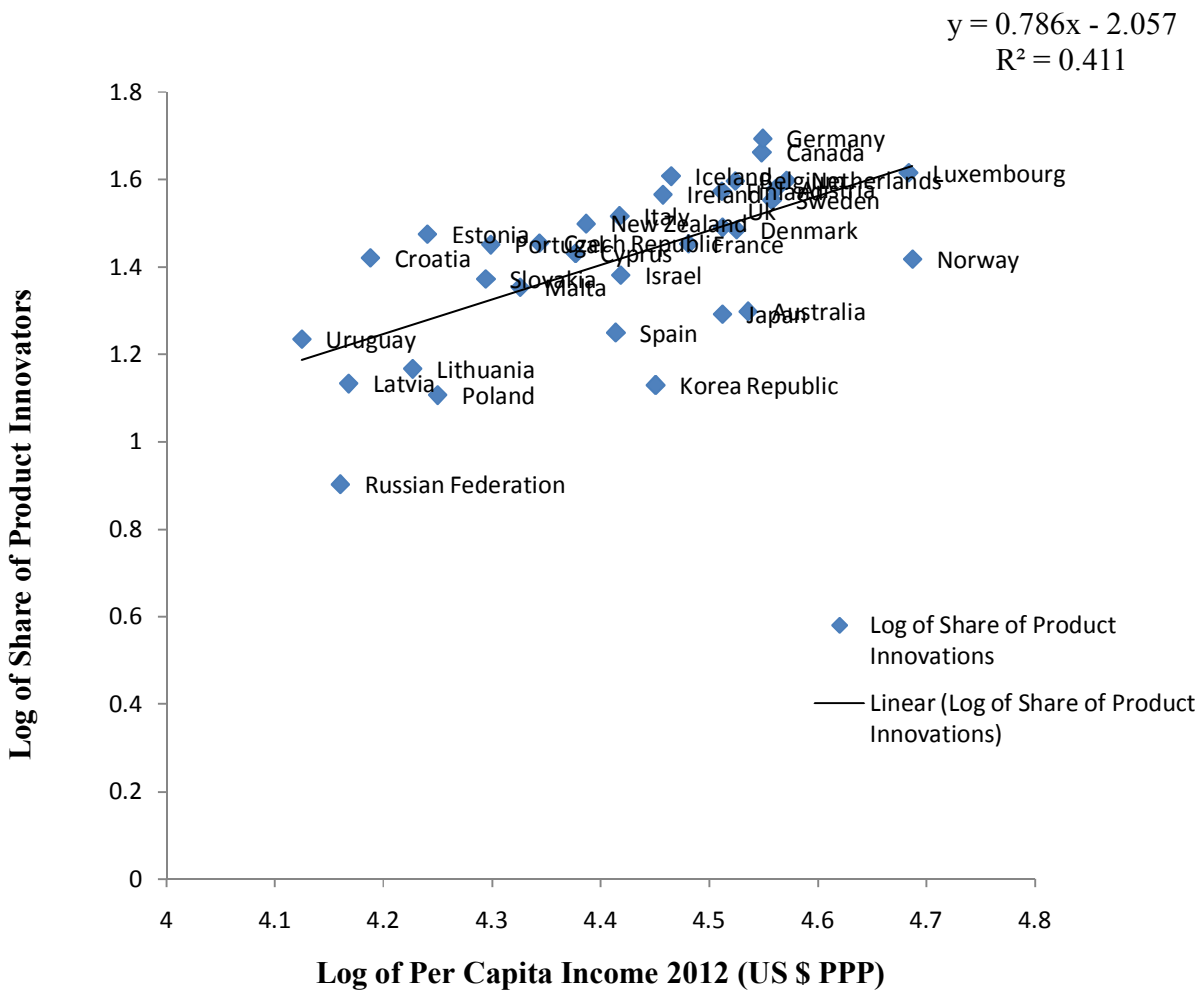


Figure 4 : Relationship between share of product innovators and per capita income across developed countries



It is imperative to examine the distribution of manufacturing firms actively engaged in innovations (product and process) and also social organizational innovations according to size classes. The distribution of innovative firms according to micro, small, medium and large size is presented in Table 2a. The analysis of Table 2a reveals that the size of the firm and its engagement in introducing innovations is positively correlated. The proportion of manufacturing firms implementing innovations across size classes and countries shows a clear pattern, that is, as the size of the firm increases, its engagement with implementing innovations also increases. However, in general, it is observed from the analysis that there is a high degree of concentration

of innovative firms in the large sized category. Malaysia emerged as the leading country in terms of high concentration of innovative firms in the large sized category followed by Philippines, Japan and South Korea. Contrary to this, Indian innovative firms form the inverted-u-shape relationship. In India, the highest concentration of innovative firms is in the medium sized class. Somewhat similar trends can be observed from the analysis of the distribution of firms who have engaged in organizational innovations across Asian countries (Table 2b). So far as marketing innovation distribution is concerned, three countries, that is, Japan, Malaysia and South Korea confirmed the regular pattern of movement towards large size but the other three countries, that is, India, Indonesia and Philippines recorded higher concentration of firms in the category of medium sized firms (Table 2c).

Table 2(a) Percentage of product and process innovators in manufacturing by size classes

Country	Micro	Small	Medium	Large	Total
China					21.27
India	5.219	8.408	11.7	12.28	5.68
Indonesia			6.2	7.1	6.4
Japan		9.086	15.022	30.06	11.27
Malaysia		27	32.93	42.23	34.2
Philippines	17	25.2	33.8	42	31.2
Republic of Korea	3.57	5.08	6.97	16.44	4.0219

Source: UNESCO (2015).

Table 2(b) Percentage of organizational innovators in manufacturing by size classes

Country	Micro	Small	Medium	Large	Total
China					
India	36.6	46.52	62.76	47.37	38.02
Indonesia			38	42.6	39
Japan		25.61	35.81	49.87	28.83
Malaysia		33.333	33.33	46.21	37.72
Philippines	38.7	52.3	70	66.9	57.8
Republic of Korea	13.29	18.64	24.47	43.47	14.68

Source: UNESCO (2015).

Table 2 (c) Percentage of marketing innovators in manufacturing by size classes

Country	Micro	Small	Medium	Large	Total
China					
India	34.068	44.62	57.45	43.86	35.53
Indonesia			58.5	42.6	55.2
Japan		21.4	24.94	37.93	22.85
Malaysia		38.4	47.39	64.14	50.2
Philippines	43.4	50.5	53.8	53	50.4
Republic of Korea	9	8.92	9.83	21.62	9.16

Source: UNESCO (2015).

Are Asian manufacturing firms engaged in innovations in similar or different product lines? It is possible to answer this question while examining the distribution of innovative firms across the sub-category of industries. At this level of disaggregation, the information is available only across 20 industries for three Asian countries, that is, Japan, India and South Korea, and is presented in Table 3. It is significant to note that both in Japan and South Korea, the active innovative firms are almost implementing innovations in the similar line of industrial products. For example, first three industries where both the countries' firms highly concentrate as active innovative firms are pharmaceutical, chemical products and electronic equipment. In Japan and South Korea, the fifth ranked industry according to active innovative firms is computer electronics. However, Japan's priority in innovations is textile industry where as South Korean active innovative firms are engaged in beverages. Therefore, the race for innovation between Japan and South Korea is in similar lines of industrial categories. An important fact that needs to be noted here is that active innovative firms in India are engaged in implementing innovations in different industrial products compared with Japan and South Korea, except one industry, that is, computer electronics. Whereas this industry is the fifth level priority of Japan and South Korea, Indian active innovative firms accorded it the highest priority. The other industries where Indian active innovative firms accorded higher priority are motor vehicles, rubber, printing and recorded media and leather products.

IV. Sources of Innovative Activities of Manufacturing Firms across Asian Countries

Innovations are fundamental source for growth of the firm in the fiercely competitive environment both in the domestic and global market places. The firms are also provided incentives by the policy makers to encourage innovative intensity among the firms so that

national objective of higher growth and international competitiveness of the national economy can be realized.

Table 3 : Distribution of innovative and active innovative firms across industrial products

Country	India		Japan		Republic of Korea	
	Innovative Firms	Active Innovative firms	Innovative Firms	Active Innovative firms	Innovative Firms	Active Innovative firms
Food product	13.3	31.52	31.46	35.43	16.73	20.89
Beverages	21.8	38.18	29.64	33.79	26.21	32.31
Tobacco products	8.3	15.27				
Textiles	21.3	35.77	41.65	42.54	11.7	16.91
Wearing apparel	21.6	36.73	22.46	30.13	7.5	8.18
Leather and related products	22.7	46.1	24.92	27.07	10.56	15.72
Wood and products of wood and cork, except furniture : manufacture of articles of straw and plaiting materials	11.5	21.42	18.65	23.24	2.51	6.47
Paper and paper products	14.5	38.51	21.41	23.14	11.86	16.65
Printing and reproduction of recorded media	23.29	46.6	27.12	27.99	5.49	9.3
Coke and refined petroleum products	19.1	32.58	35.35	38.38	21.1	32.11
Chemicals and chemical products	19.5	35.7	45.62	53.41	37.26	53.64
Basic pharmaceutical products and pharmaceutical preparations	29.7	40.45	55.68	60	30.2	71.81
Rubber and plastic products	20.19	46.7	30.21	35	11.26	15.96
Other non-metallic mineral products	9.7	25.02	14.48	16.54	13.5	17.15
Basic metals	14.3	30.49	20.41	25.21	12.45	15.72
Fabricated metal products, except machinery and equipment	20.38	34.82	28.61	33.38	16.16	22.51
Computer, electronics and optical products	30.37	52.59	33.91	39.82	20.43	31.36
Electronic-equipment	23.39	38.56	36.4	43.86	27.2	37.61
Machinery and equipment n.e.c.	25.23	41.42	28.91	35.26	23.43	30.73
Motor vehicles, trailers and semi-trailers	31.5	51.333	28.22	33.16	14.32	19.68
Other transport equipment	16.1	27.4	9.5	13.4	14.4	18.9
Furniture	25.4	47.5	24	25.2	18.6	19.3
Other manufacturing	25.5	37.3	34.0	47.8	11.9	11.9
Repair and installation of machinery and equipment	22.2	34.4	12.7	15.9		
Innovative firms in manufacturing	18.5	35.6	28.5	33.0	17.5	24.3

Source: UNESCO (2015).

Therefore, it is imperative to examine the sources that innovative firms employ to increase their intensity of innovation. The distribution of innovative firms according to type of sources employed to do innovations across Asian countries are presented in Table 4 and Figure 5. The innovative manufacturing firms from South Korea had the highest proportion of firms (86.37 per cent) depending on in-house R&D as a source of innovations. In this context, Lee and Mathews (2012) have argued that the public policy of South Korea in fact generated high rents for product innovations but international competitive environment forced the Chaebol firms to increase the intensity of R&D expenditure. They have further emphasized that government reshaped incentive system in a manner that remained complementary to the firms which were engaged in in-house R&D.

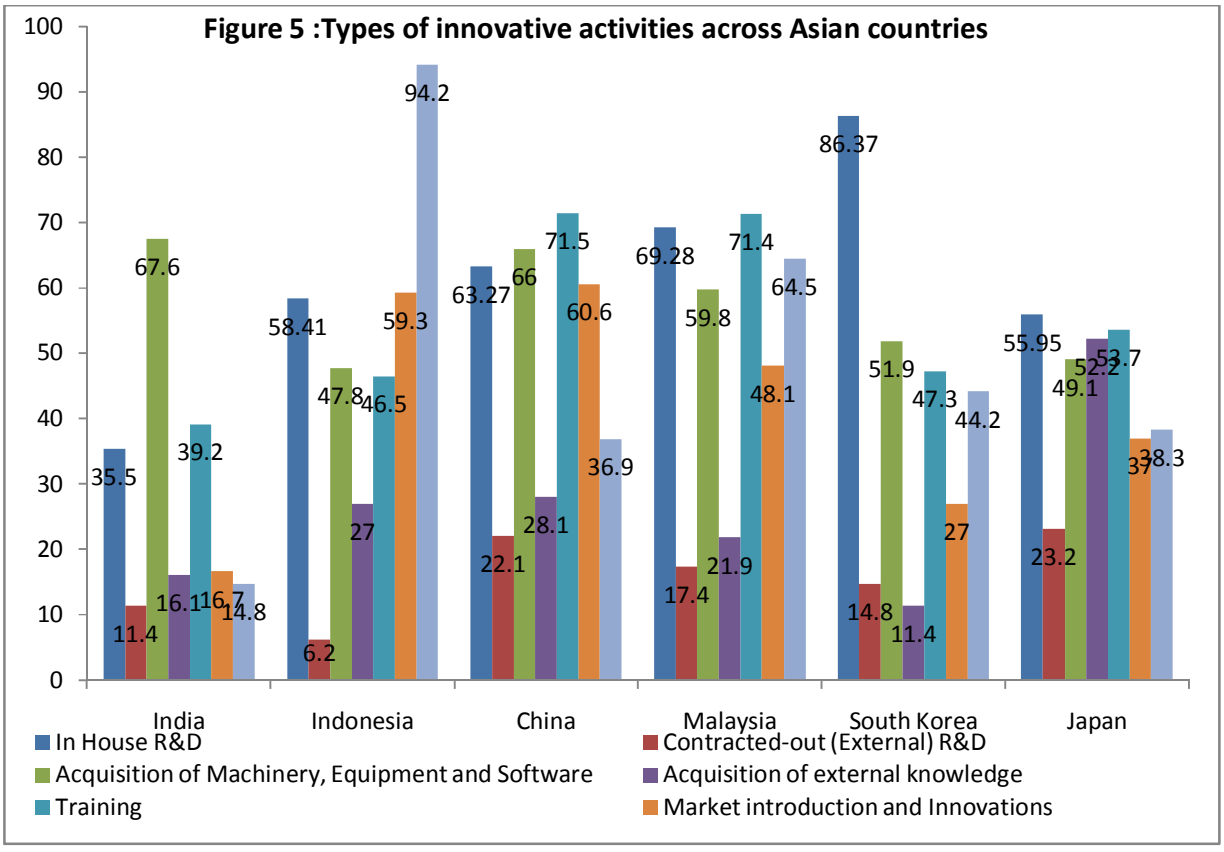
Internal research and development performers in East Asian countries are ranging between 86.37 per cent in South Korea and 55.95 per cent in Japan. Malaysia, China and Indonesia recorded 69.28, 63.27 and 58.41 per cent respectively R&D performer firms. It is amazing to note that a very high proportion of innovative firms were engaged in in-house R&D across East Asian countries. The proportion of firms engaged in internal R&D in India is 35.5 per cent. This is very low level compared with East Asian standards. The proportion of firms that contracted out R&D is also higher in East Asian countries compared with Indian firms, except Indonesian firms. But it is quite a small proportion compared with the engagement of innovative firms in internal R&D.

Table 4: Types of innovative activities of manufacturing firms across Asian countries (figures in percentages)

Country	In House R&D	Contracted-out (External) R&D	Acquisition of Machinery, Equipment and Software	Acquisition of external knowledge	Training	Market introduction and Innovations	Other Preparations
India	35.5	11.4	67.6	16.1	39.2	16.7	14.8
Indonesia	58.41	6.2	47.8	27	46.5	59.3	94.2
China	63.27	22.1	66	28.1	71.5	60.6	36.9
Malaysia	69.28	17.4	59.8	21.9	71.4	48.1	64.5
South Korea	86.37	14.8	51.9	11.4	47.3	27	44.2
Japan	55.95	23.2	49.1	52.2	53.7	37	38.3
Average	61.46	15.85	57.03	26.12	54.93	41.45	48.82
Standard Deviation	15.27	5.91	7.90	13.04	12.41	16.18	24.96
Coefficient of Variation	24.84	37.28	13.85	49.92	22.59	39.03	51.12

Source: UNESCO (2015).

Among the sources of innovative firms, across the board all the countries under consideration accorded highest priority to acquisition of machinery, equipment and software. Indian firms had shown highest proportion (67.6 per cent) but lowest value is 47.8 per cent for Indonesia. The acquisition of machinery, equipment and software turned out to be the predominant activity compared with other sources. The imbalance in the technology balance of payment of these countries confirmed that their dependence for technology on other developed countries is very high except Japan where technology balance of payments is surplus. It is important to note that Japan has shown a high proportion (52.2 per cent) of firms acquiring external knowledge. Skill base through which imparting training to employees is very high in China (71.5 per cent) followed by Malaysia (71.4 per cent), Japan (53.7 per cent), South Korea (47.3 per cent), Indonesia (46.5 per cent) and lowest (39.2 per cent) in India (Table 4). When we look at the coefficient of variation across various sources of innovations, the lowest value (13.85 per cent) for the source-acquisition of machinery, equipment and software provides evidence of high priority to this source followed by training (22.59 per cent) and in-house R&D (24.84 per cent).



Firms are social organizations and have substantial linkages across numerous other social organizations. Inter-firm network of relationship entails learning from each others, sharing information and resources, and transfer of knowledge (Gilbert, Ahrweiler and Pyka 2007). The strategic uses of network of relationship by the firms help them in internationalization and also substantially contribute to their international performance (Lin, Chang, Ou and Tseng 2014). The innovation survey indentified 10 common social organizations where firms can interact to draw crucial knowledge for using it for further becoming innovative. These forms of knowledge acquisitions are reported in Table 5 and Figure 6. As observed in the networks relationship literature, the most important source of relationship recorded by the firms is inter-firm networking. Except Indonesian firms, in all other Asian countries firms have highly valued enterprise group relationship to acquire technological knowledge and learning that enhances the firm's innovative performance. However, there are wide variations observed across countries where the proportion of Malaysian firms (72 per cent) was highest followed by Philippines (70.7 per cent), India (58.54 per cent) and China (49.5 per cent). In the inter-enterprise network of relationships, 47.35 per cent and 33.65 per cent of the firms from South Korea and Japan respectively rated it very highly. The firms usually obtain information from the equipment and components/software suppliers regarding knowledge transfer. Therefore, all the countries innovative firms included in the sample rated this source as important. But two countries, Philippines and India, recorded a high proportion of firms (49.5 per cent and 43.3 per cent respectively) that used this channel of network. The interaction with the client customers in the era of information technology have been considered most significant. Therefore all the country firms rated it very highly except Indonesian firms. Two network channels, that is, competitors and commercial consultants and private R&D institutions, were accorded low priority by firms across the board. Among all the preferred channels of information, the lowest preference firms were institutions/universities of higher learning. Firms from China, Malaysia, and India had shown higher preference to obtain input from the public research institutes as compared with Japan, South Korea and Philippines. However, Indonesia showed exceptionally lower preference. Trade fairs, scientific journals' publications and interaction with professional industry associations are other important channels firms used to enhance their innovativeness across Asian countries.

Table 5: Sources of inputs (information) rated highly important by innovative firms across Asian countries

Country	Enterprise or enterprise group	suppliers of equipment, materials and components or software	Clients or customers	Competitors or other enterprises in their sector	Consultants, commercial laboratories or private R&D institutes	Universities or other higher education institutions	Government or public research institutes	Conferences, trade fairs, exhibitions	Scientific journals and trade/technical publications	Professional and industry associations
China	49.49	21.63	59.7	29.64	17.11	8.93	24.7	26.68	11.97	14.77
India	58.54	43.3	58.95	32.63	16.82	7.94	11.03	29.74	15.14	24.46
Indonesia	0.4	1.3	1.8	1.3	0.9	0.4	0.4	0.9	0.9	0.9
Japan	33.65	20.7	30.46	7.48	6.15	5.09	4.78	4.57	2	2.88
Malaysia	72	39	39.6	33.9	39.6	17.1	17.3	25.1	22.9	23.2
Philippines	70.7	49.5	66.2	37.9	21.2	10.1	7.1	21.7	16.7	15.7
South Korea	47.35	16.1	27.72	11.28	3.39	3.93	6.06	6.66	5.16	4.92
Average	47.45	27.36	40.63	22.02	15.02	7.64	10.20	16.48	10.68	12.40
Standard Deviation	24.75	17.14	22.85	14.83	13.31	5.32	8.30	11.99	8.25	9.64
Coefficient of Variation	52.16	62.65	56.23	67.36	88.60	69.65	81.42	72.76	77.26	77.70

Source: UNESCO (2015).

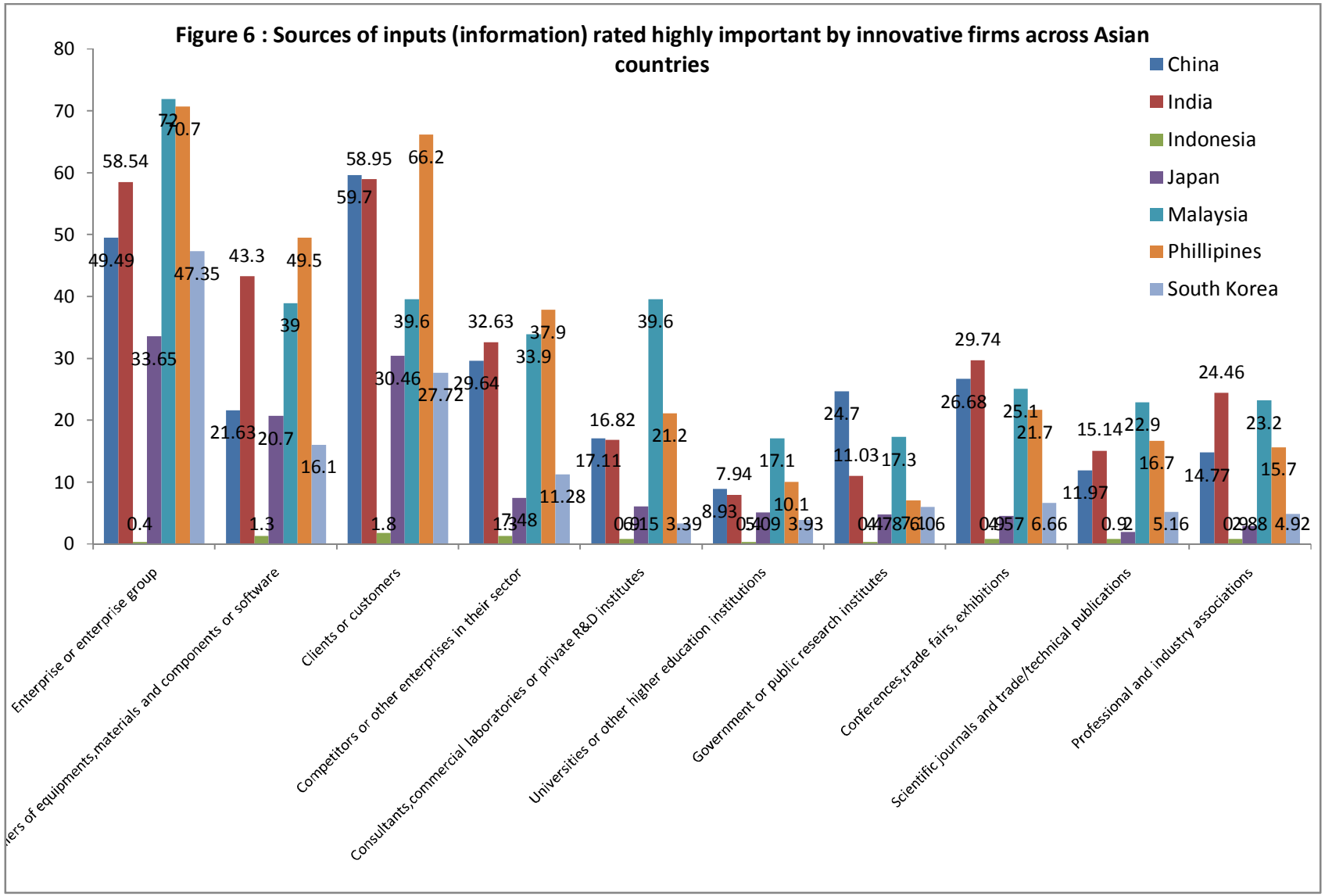
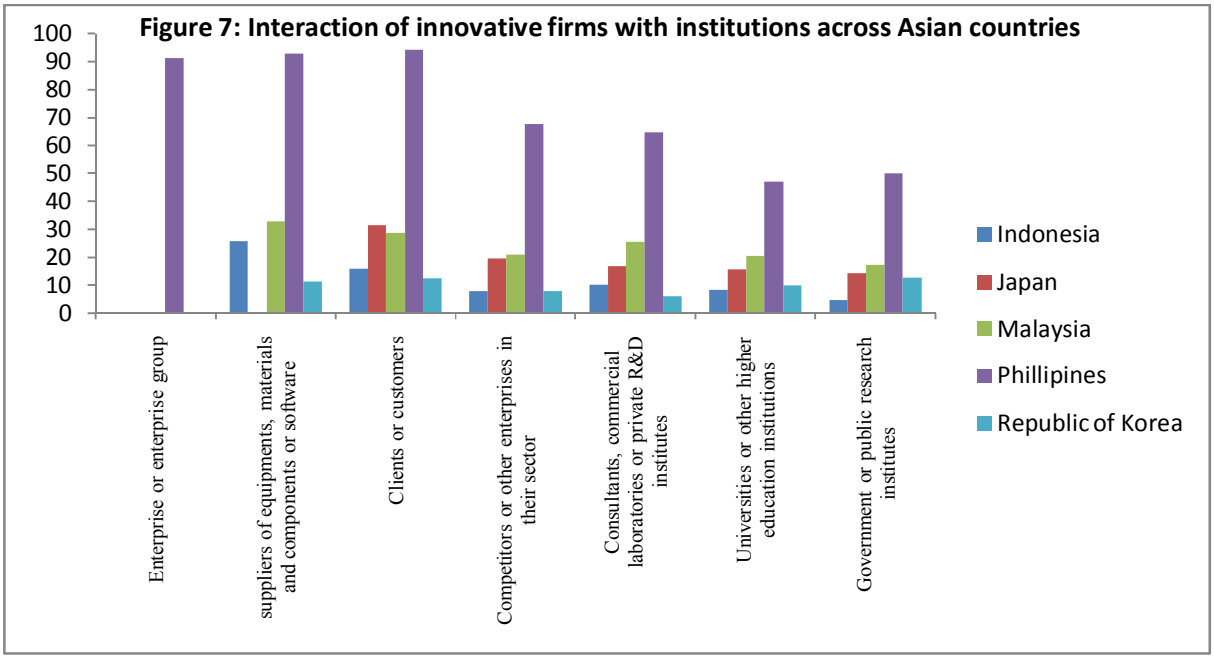


Figure 6 : Sources of inputs (information) rated highly important by innovative firms across Asian countries
China
India
Indonesia
Japan
Malaysia
Phillipines
South Korea
80
70
60
50
40
30
20
10
0
Enterprise or enterprise group
Clients or customers
Competitors or other enterprises in their sector
Universities or other higher education institutions
Government or public research institutes
Conferences,trade fairs, exhibitions
Professional and industry associations

Table 6: Interaction of innovative firms with institutions across Asian countries

Country	Enterprise or enterprise group	suppliers of equipment, materials and components or software	Clients or customers	Competitors or other enterprises in their sector	Consultants, commercial laboratories or private R&D institutes	Universities or other higher education institutions	Government or public research institutes
Indonesia		25.7	15.9	8	10.2	8.4	4.9
Japan			31.45	19.88	16.9	15.7	14.37
Malaysia		32.85	28.8	21.19	25.47	20.71	17.38
Philippines	91.2	92.6	94.1	67.6	64.7	47.1	50
Republic of Korea		11.51	12.75	8.08	6.27	9.99	12.8
Average		40.67	36.60	24.95	24.71	20.38	19.89
Standard Deviation		35.74	33.13	24.65	23.51	15.71	17.45
Coefficient of Variation		87.89	90.52	98.80	95.16	77.09	87.74

Source: UNESCO (2015).



An important way through which active innovative firms seek cooperation, collaborations and joint projects that determine the capabilities of the firms to innovate is active participation in joint projects with other organizations and public institutions. The university/public research institutions-industry interaction has drawn the attention of several scholars across developed and developing countries (Kruss et al 2015; Schiller and Lee 2015). When firms establish in house

R&D laboratories and encounter problems in realizing specific objectives, they seek support from external sources such as public research institutions/universities and partners. At that stage the form of interaction turns out to be joint projects/cooperation and contract research (Schiller and Lee 2015:64). There are seven institutions that have been identified among the Asian countries which use this channel of cooperation/joint projects by the firms for enhancing innovative capabilities. Firms from China and India have not reported participation in such activities (Table 6 and Figure 7). It is important to note here that among the East Asian countries, Philippines firms have highly shown their participation in all the channels for developing joint projects. Joint research and innovative activity in which largest proportion of firms cooperated was with client/customers (94.1 per cent) and lowest proportion was with university/institutions of higher learning. Firms from Japan and Malaysia also have established cooperation/joint project with the client/customers. This source was accorded highest priority by these country firms. There are wide variations observed from the very high value of coefficients of variations across all the channels of joint R&D projects. Except enterprise group, the South Korean firms established cooperation/joint R&D projects, but the proportion of innovative firms involved in this channel has remained quite small. However, the public research institutions attracted largest proportion of South Korean firms. This is quite understandable since the government of South Korea, as a matter of policy, has encouraged firms to establish cooperation and draw benefits out of the public funded research (Singh and Bhangoo 2014).

V. Barriers to Innovations across Active Innovative and Non-innovative Asian Firms

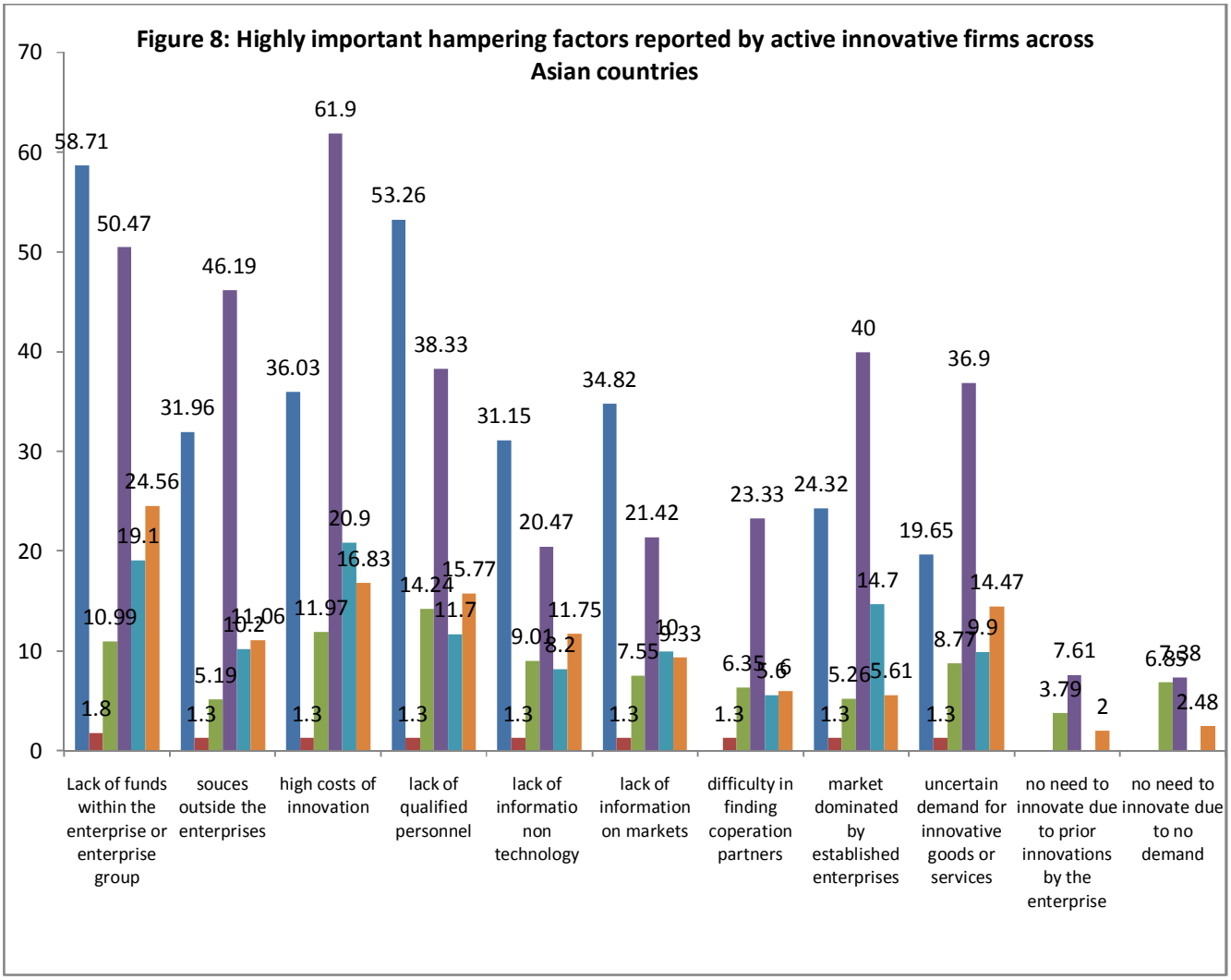
It is a matter of great concern for policy makers that to ensure competitiveness of firms both in the domestic and international markets, the roadblocks faced by firms be gradually reduced or eliminated. Firms and their associations are usually working with the government and exert significant influence in introducing suitable changes in public policy. The economic theory of lobbying is a testimony to this. However, this process of seeking more and more favorable facilities for enhancing capabilities of the firms is an unending process because the environment in which firms interact is dynamic. Another factor that keeps firms at tenterhooks is the contestability of their competitive advantage. Therefore, it is imperative to examine the problems encountered by the active innovative firms and also non-innovative firms that constitute majority of sampled firms. The active innovative firms across Asian countries reported mainly 11 barriers

faced by the firms which can be classified in four broad categories as cost factors, knowledge factors, market factors and factors prohibiting innovations and are reported in Table 7 and through Figure 8.

Table 7: Highly important hampering factors reported by active innovative firms across Asian countries

Country	India	Indonesia	Japan	Malaysia	Philippines	Republic of Korea	Average	Standard Deviation	Coefficient of Variation
Lack of funds within the enterprise or enterprise group	58.71	1.8	10.99	50.47	19.1	24.56	27.61	22.42	81.23
Sources outside the enterprises	31.96	1.3	5.19	46.19	10.2	11.06	17.65	17.55	99.46
High costs of innovation	36.03	1.3	11.97	61.9	20.9	16.83	24.82	21.44	86.37
Lack of qualified personnel	53.26	1.3	14.24	38.33	11.7	15.77	22.43	19.37	86.35
Lack of information non technology	31.15	1.3	9.01	20.47	8.2	11.75	13.65	10.58	77.56
Lack of information on markets	34.82	1.3	7.55	21.42	10	9.33	14.07	12.08	85.83
Difficulty in finding co-operation partners		1.3	6.35	23.33	5.6	6	8.52	8.53	100.17
Market dominated by established enterprises	24.32	1.3	5.26	40	14.7	5.61	15.2	14.71	96.81
Uncertain demand for innovative goods or services	19.65	1.3	8.77	36.9	9.9	14.47	15.17	12.28	80.97
No need to innovate due to prior innovations by the enterprise			3.79	7.61		2	4.47	2.87	64.15
No need to innovate due to no demand			6.85	7.38		2.48	5.57	2.69	48.28

Source: UNESCO (2015).



There are wide variations across countries regarding factors faced by the active innovative firms as observed from the values of the coefficients of variation. An important factor that emerged from the analysis is the availability of financial resources for incurring expenditure on innovation projects. 58.71 per cent and 50.47 per cent firms of India and Malaysia respectively reported lack of funds. In fact, it is a very high proportion of firms suffering from fund crunch. However, only 24.56 per cent firms from South Korea reported shortages of funds to finance innovations. It is important to note that in Japan active innovative firms that are facing lack of funds within the firm are very low (10.99 per cent). The lack of access to outside sources of finance is quite high among the active innovative firms in the countries of Malaysia and India. However, in the other countries of Asia, the lack of access to finance is reported, but it is very

low. As low as 5.19 per cent of the active innovative firms from Japan reported lack of external sources of finance. So far as the cost involved in innovations is concerned, a very high proportion of Malaysian firms (61.9 per cent) reported that innovations are highly costly. This proportion for Indian firms is 36.03 per cent. The other East Asian countries reported low proportion of firms but this problem is very much in existence in highly developed countries such as Japan and South Korea as well.

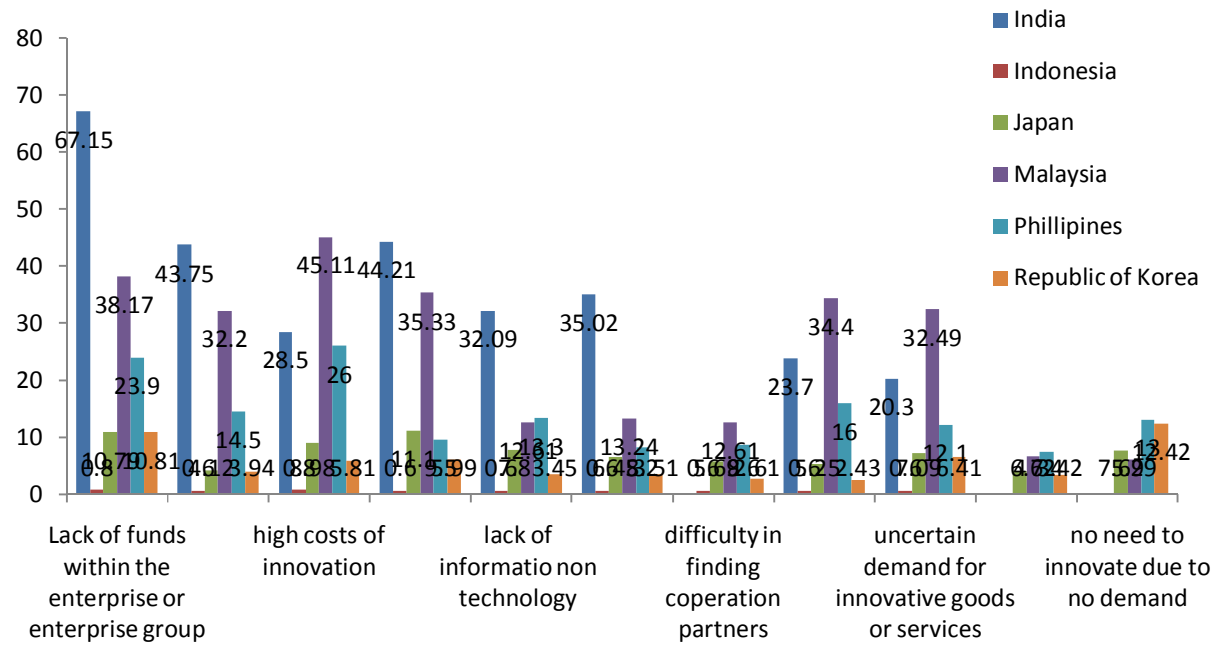
The second set of barriers reported by the active innovative firms across Asian countries is related to access to knowledge. Skilled manpower shortages were reported as high as 53.26 per cent of active innovative firms of India, followed by Malaysia (38.33 per cent). Firms from South Korea and Japan also reported lack of qualified personnel that can be employed in R&D projects, but it is a very low proportion of firms (15.77 per cent and 14.24 per cent respectively) compared with India and Malaysia who rated this problem highly. It is important to note that the Asian countries are at different stages of technological maturity. Japan and Korea are at the frontiers of knowledge in most important industrial products and therefore the barriers faced by the firms in the area of knowledge factors are very low. In the case of early stage of technological development like India and Malaysia, high proportion of their active innovative firms is facing higher degree of barriers. This is obvious because the national innovation system has not developed to the extent that it can provide the firms access to knowledge sources with ease. It is interesting to note that the marketing factors that hamper innovations are very low in the case of highly developed Asian countries. It is well known that majority of the innovative firms belongs to the large sized category of firms in Japan and South Korea, therefore, a low proportion of firms reported market dominance of large firms in these countries. However, a very high proportion of firms from Malaysia and India reported this problem (Table 7). The uncertainty of demand is relatively very high in medium stage of innovative firms compared with the early and mature stage of innovative country firms. The two factors come under the category of reasons to not to be innovative show that a very low proportion of firms from Malaysia, Japan and South Korea reported problems in this category. However, the other three countries' firms have not reported about these factors at all.

Table 8: Highly important hampering factors reported by non- innovative manufacturing firms across Asian countries

Country	India	Indonesia	Japan	Malaysia	Philippines	Republic of Korea	Average	Standard Deviation	Coefficient of Variation
Lack of funds within the enterprise or enterprise group	67.15	0.8	10.79	38.17	23.9	10.81	25.27	24.24774	95.95465
Sources outside the enterprises	43.75	0.6	4.12	32.2	14.5	3.94	16.51833	17.64584	106.8258
High costs of innovation	28.5	0.8	8.98	45.11	26	5.81	19.2	16.88999	87.96869
Lack of qualified personnel	44.21	0.6	11.1	35.33	9.5	5.99	17.78833	17.62886	99.10352
Lack of information non technology	32.09	0.6	7.8	12.61	13.3	3.45	11.64167	11.18573	96.08354
Lack of information on markets	35.02	0.6	6.45	13.24	8.2	3.51	11.17	12.44674	111.4301
Difficulty in finding cooperation partners	-	0.6	5.69	12.61	8.6	2.61	6.022	4.774879	79.29059
Market dominated by established enterprises	23.7	0.6	5.25	34.4	16	2.43	13.73	13.4447	97.92208
Uncertain demand for innovative goods or services	20.3	0.6	7.09	32.49	12.1	6.41	13.165	11.54048	87.66028
No need to innovate due to prior innovations by the enterprise	-	-	4	6.62	7.4	3.42	5.36	1.946141	36.30861
No need to innovate due to no demand	-	-	7.62	5.99	13	12.42	9.7575	3.481651	35.68179

Source: UNESCO (2015).

Figure 9: Highly important hampering factors reported non-innovative manufacturing firms across Asian countries



The non-innovative firms from Asian countries also reported barriers that inhibit them from participation in the process of innovations. The most important factor that is highly ranked is lack of internal funds with the enterprises (Table 8 and Figure 9). The proportion of Indian firms (67.15 per cent) is very high which have been affected due to lack of funds within firms, followed by Malaysian firms (38.17 per cent) and Philippines firms (23.9 per cent). In case of non-innovative firms in South Korea and Japan, the incidence of lack of internal funds is relatively low. The other cost factors which are external (lack of funds outside enterprise and cost of innovations) to the firms also present somewhat similar picture across Asian countries. The other set of factors that increases the barrier to the non-innovative firms to enter in the process of innovations are shortage of qualified personnel, non-availability of information regarding technology and markets, and also lack of R&D project partners. These factors are related to knowledge acquisition by the firms. The dominance of large sized firms in the market and high degree of uncertainty regarding demand for innovative goods and services are the other barriers valued very highly by the Asian firms. However, the wide variations regarding these

characteristics that inhibit non-innovative firms to participate in innovations were reported across Asian countries. The availability of information regarding existence of prior innovations and expected lack of demand for new innovations are the other two factors reported by the firms from Japan, South Korea and Philippines. It is significant to note that incidence of firms who have reported on these factors is very low as well as the coefficients of variation across East Asian countries is also very low.

VI. Conclusions

This paper has examined the rise of Asian firms in the global context and their increasing innovation capabilities. The theory of growth of the firm has also been reviewed to identify the theoretical basis of the rise of firms. The theory has underlined multiple factors that contribute to the expansion and growth of firms. The evolutionary-capability-learning approach supplemented by the national innovation framework seems to explain better the recent rise of Asian firms in the global markets. It is further complemented by the OLI theory that brings out unique competitive advantage encourages firms to internationalize. Empirical studies following evolutionary technology capability examined Asian firms and the evolution of innovation capabilities in the process of catching up. These studies have been based on thin sample as well as successful firms and suffer from usual sample selection bias. This paper based on Oslo manual approach based survey conducted across Asian countries and data compiled by UNESCO examines the extent of manufacturing firms' innovation capabilities, sources of innovations and barriers to innovations of seven Asian countries.

The analysis of technological innovations and social innovations across Asian countries shows that on an average the participation of manufacturing firms in social innovations is higher than the technological innovations. The low variations across active innovative firms in the Asian countries imply that the innovation activities to develop product and process innovations are stable and rising. The relationship between level of economic development approximated by per capita income and active innovative firms of Asian countries is negative and elasticity coefficient is -0.11. This finding clearly brings out the tendency toward catch up in innovation intensity among the Asian countries. Furthermore, the finding is further confirmed when we have enlarged the scope of the sample to 21 developing countries. Contrary to this, the relationship between innovation intensity and per capita income of developed countries is positive and

significant. Thus the incidence of innovation intensity is rises more or less in line with per capita income.

The analysis of the innovation intensity across firm size classes among the East Asian countries shows the tendency toward concentration of active innovative firms in the large size classes. India innovative firms, however, form the inverted-u-shaped relationship and high degree of innovations are concentrated in the medium sized category of firms. Social innovations in Japan, South Korea and Malaysia confirmed the regular trend across the size classes where as medium sized firms across India, Indonesia and Philippines dominates in social innovations. Across industrial categories innovation intensity analysis shows that the firms from Japan and South Korea are competing in the almost in the same product lines. However, Indian firms are active in innovations in different line of manufacturing products compared with Japan and South Korea.

Among the sources of innovations, the most important source of innovation turns out to be in-house R&D expenditure. In Asian countries, South Korean firms were the leading lights in terms of developing in-house R&D projects. On the whole, East Asian firms are highly in-house R&D intensive whereas Indian firms have low in-house R&D intensities. There are wide variations observed across Asian countries using inter-enterprise network of relationship in enhances knowledge for Innovative performance. Firms from China, Malaysia and India had shown high preference to obtain input from public research institutes as compared with Japan, South Korea and Philippines. The major finding that emerges from the analysis of the barrier to innovative and non innovative firms is the deficiency of internal and external finances, except firms of Japan and South Korea. The environmental constraints are more important in the case of firms from Asian countries where the national innovation system is at nascent phase. Therefore, it suggested that public policy should accord higher priority to invest higher proportion of resources to relieve the firms from such constraints.

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Comparative Perspectives on Business groups in Korea, Japan, and China

Keun Lee

Evolution of the business groups in Korea, China, and Japan

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Business Groups (BG)

- Def) collections of firms bound together in some formal and/or informal ways, characterized by an intermediate level of binding, namely neither bound merely by short term strategic alliances nor legally consolidated into a single entity (Granovetter 1995);

A Puzzle

1) Diversified conglomerates, "business groups," found extensively in emerging economies.
   - Why? Market failure?

2) Despite market maturing (globalization and liberalization), not much decreasing->Why?

In Asia

- China — Keister (1998), Peng (2000)
- Hong Kong — Au, Peng, and Wang (2000), Redding (1990)
- India — Ghemawat and Khanna (1998), Khanna and Palepu (2000)
- Southeast Asia — Yoshihara (1988)
- South Korea — Chang and Choi (1988), Hamilton and Biggart (1988), Hamilton and Feenstra (1995), Ungson, Steers, and Park (1997)
- Taiwan — Hamilton and Biggart (1988), Hamilton and Feenstra (1995)

More in Other Areas

- *Central and Eastern Europe*
  - Hungary — Stark (1996)
  - Russia — Freinkman (1995), Johnson (1997)
- ***Latin America***
  - Argentina — Guillen (2000)
  - Brazil — Evans (1979)
  - Chile — Khanna and Palepu (1999, 2000)
  - Central America — Strachan (1976)
  - Mexico — Camp (1989)

Focus of the Talk

1) Which Theoretical Views

On Business groups

2) Their long term performance:

Eventual decline with correcting market failure

or still sources of growth not subject to market failure

3) How and Why they keep evolving

4) BGs in Korea, Japan, China: different/similar

A talk based on 5 papers of Keun Lee

1) Journal of Japanese and International economies (2010),
"Long-term evolution of the firm value and behavior of business groups: Korean Chaebols between weak premium, strong discount and strong premium ."

2) *Journal of Economic Behavior and Organization (*2010),
"Understanding the Behavior of Business Groups: A Dynamic Model and Empirical Evidence ."

3) Seo, Keun Lee, & Wang, 2010, "Causes for the Performance Change of Business Groups: Market-level vs firm-level factors in China, *Industrial & Corporate Change*, 19 (6).

4) Choo, Keun Lee, Ryu and Yoon, (*Econ. Dev't & Cultural Change, 2009/3*),"
"Explaining Performance Change of Chaebols over the Two decades: Technological Capabilities vs. Investment Inefficiency"

5) "Comparing the Productivity Impacts of Knowledge Spillovers from Network and Arm's Length Industries: Findings from Business Groups in Korea" Lee, et al, Industrial and Corporate Change 2015

Comparison of BGs in Korea, Japan, and early 90s' China

	Japan Group vs. Ind	Korea Group vs. Ind	China Group vs. Ind (early 90s)
Debt equity ratio	>	>	>
Capital/Labor ratio	>	>	?
Growth	<	>	<
(reason)	Cautious Bank	Aggressive Owner	risk-averse manager
Profitability	<	<	<
(reason)	rent to banks	rent to owner	Rent to bureaucrat/manager

Source: Weinstein & Yafeh (1998), JF Lee, Ryu, & Yoon (1999); Lee and Woo (1999).

Basic profile and Definition of BGs in China

Def) A collection of legally independent entities that are partly or wholly owned by a parent firm and registered as affiliated firms of that parent firm.

- To be registered with the State Administration for Industry and Commerce (SAIC).

- (SAIC rule):

=> parent company of BGs should have a registered capital of over 50 million *yuan* plus at least 5 affiliated companies;

+ a total registered capital (including the core and other affiliated companies) of over 100 million *yuan*.

- The period 1997-2005
  - N0. of BGs registered: 20%↑(from 2,369 to 2,845)
  - No. of workers in BGs: 53.1%↑(18.5 mil. to 28.4 millions)
  - Sales, percentage of GDP: 136.8%↑(from 35.7% to 84.6%)

Table 1. Basic statistics of Chinese business groups

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of Groups	2,369	2,472	2,757	2,655	2,710	2,627	2,692	2,764	2,845
Total assets(billion)	5,045.7	6,699.4	8,732.3	10,698.4	12,804.5	14,253.8	17,017.0	19,472.1	23,076.3
Total revenue(billion)	2,820.5	3,507.7	4,376.6	5,326.0	6,562.3	7,712.0	10,009.5	12,638.7	15,550.9
Percentage of GDP	35.7	41.6	48.8	53.7	59.8	64.1	73.7	79.1	84.6
Total employees (thousand)	18,500	20,900	23,420	22,820	25,240	25,180	25,850	26,712	28,359

Summary: 3,000 BGs in China

- **Explicit definition of BGs: to be registered at the State Administration for Industry and Commerce (SAIC).**

  -> 5 or more affiliates; over 100 million *yuan* capital total.

  - their sales share in GDP: 35.7% in 97' -> 84.6% in 05'
- **Simple vertical structure pyramids, owned by the state not by families, with its core company at the first tier owing majority shares over affiliates.**
- **Less diversified, with some having finance and R&D units.**
- **Performance: improving over time;**

  Less profitable than non-BGs; growing slowly or equally;
- **Governance: No personal owners under multi-tier structure leading to the asset stripping and agency costs.**

Three Theories about BGs

'Theory 1:
Fulfilling the Institutional Voids :
Market Failure & Transaction Costs

- Market Failure: Leff (1978); Goto (1982)
- 'institutional voids' argument by Khanna and Palepu (1997; 2000).
- Since many of the institutions that support business activities are absent in many parts of the world, the business groups emerge to fill the institutional voids.

Theory 2: Finance(agency cost)-based View

BGs = CMS (controlling minority structure = separation of voting and income rights) offers incentive for excessive investment arising from the so called agency problem

-> We would like to study whether the Korean Chaebol firms have corrected themselves from investment inefficiency during and after the 1997 Asian crisis period whereas they were subject to serious investment inefficiency before the crisis

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Theory 3 (Resource-based view)

Importance of technological capabilities such as patent applications might have increased over time as the economy have become more mature and open.

->We also would like to study whether the Chaebol firms have technological advantages, and whether such advantages explain the long term change in productive efficiency.

We proxy technological capabilities by patent applications by each firm.

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Testing for 5 Hypothesis (JJIE 2010) in Korea

- Over-investment hypothesis
- Cross-subsidization hypothesis
- Profit stability hypothesis
- Co-insurance effect

(Debt capacity vs. Tax shields)

Results	1984-88	1990-95	2001-2005
Excess value Firm-level gap with non-chaebol Group-level: median Tobin Q (firm-level ;chaebol dummy	 +* +* +*	 -* -* -	 +* +* +*
Profit stability hypothesis	Yes*/No*	Yes*	No*
Accounting profitability	Low return and low variance*	Low return and low variance*	High return and low variance*
Stock market return	High return and low variance	Low return and low variance *	High return and low variance
Over-investment (group/firm-level)	Yes*/No	Yes/Yes*	No/No
Performance hypothesis	- *	No	+*
Cross-subsidization hypothesis	No	Yes	Yes
Debt-capacity advantage	No	Yes*	No
Tax advantage	Yes*	Yes*	No

Excess Value Annual firm-level regressions of Tobin Q

Sample	Number of Observations	Intercept	Chaebol dummy	ln(total_asset)	Leverage	EBIT/Sales	Capex/sales	Beta
1984-1988	1022	1.128***	**0.057*** **	-0.044***	0.815***	0.356***	-0.001	0.035***
	(0.622)	(0.000)	**(0.002)**	(0.000)	(0.000)	(0.001)	(0.602)	(0.000)
1990-1995	2814	1.647***	-0.020*	-0.059***	0.768***	0.144	-0.050***	-0.000
	(0.560)	(0.000)	(0.051)	(0.000)	(0.000)	(0.305)	(0.001)	(0.974)
2001-2005	2765	0.838***	**0.131*** **	-0.018**	0.712***	0.141	-0.002	0.019***
	(0.220)	(0.000)	**(0.000)**	(0.050)	(0.000)	(0.287)	(0.935)	(0.001)
1984	168	0.722***	0.014	-0.029***	0.855***	0.397***	-0.002**	0.006
	(0.862)	(0.000)	(0.308)	(0.000)	(0.000)	(0.001)	(0.024)	(0.258)
1985	177	0.748***	0.010	-0.025***	0.765***	0.222**	0.044	0.045***
	(0.768)	(0.000)	(0.476)	(0.000)	(0.000)	(0.041)	(0.198)	(0.000)
1986	189	0.936***	0.065**	-0.042***	0.900***	0.360***	0.004	0.079***
	(0.880)	(0.000)	(0.032)	(0.000)	(0.000)	(0.001)	(0.847)	(0.000)
1987	217	1.707***	0.062*	-0.070***	0.864***	0.211*	0.083	-0.047***
	(0.737)	(0.000)	(0.065)	(0.000)	(0.000)	(0.057)	(0.295)	(0.000)
1988	271	1.738***	0.120***	-0.069***	0.827***	0.292	-0.001	0.024*
	(0.658)	(0.000)	(0.007)	(0.000)	(0.000)	(0.255)	(0.986)	(0.081)

Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and * respectively.

[Table 3_continued] Annual firm-level regressions of Tobin Q

Sample	Number of Observations	Intercept	Chaebol dummy	ln(total_asset)	Leverage	EBIT/Sales	Capex/sales	Beta
1990	436	1.874***	0.042*	-0.076***	0.866***	0.183	-0.010	0.000
	(0.729)	(0.000)	(0.069)	(0.000)	(0.000)	(0.181)	(0.807)	(0.942)
1991	454	1.222***	0.030*	-0.044***	0.820***	0.101	-0.085***	0.001
	(0.750)	(0.000)	(0.080)	(0.000)	(0.000)	(0.446)	(0.000)	(0.274)
1992	461	1.721***	**0.010**	-0.060***	0.601***	0.171	-0.033***	0.000
	(0.448)	(0.000)	**(0.552)**	(0.000)	(0.000)	(0.213)	(0.005)	(0.395)
1993	472	1.811***	**-0.030**	-0.066***	0.802***	-0.262	-0.033	0.015
	(0.762)	(0.000)	**(0.194)**	(0.000)	(0.000)	(0.162)	(0.524)	(0.287)
1994	484	2.485***	**-0.052** **	-0.094***	0.631***	0.896***	0.049	0.001**
	(0.380)	(0.000)	**(0.032)**	(0.000)	(0.000)	(0.000)	(0.448)	(0.013)
1995	507	1.692***	**-0.017**	-0.059***	0.632***	0.619***	-0.053*	-0.000
	(0.390)	(0.000)	**(0.513)**	(0.000)	(0.000)	(0.000)	(0.095)	(0.789)
2001	540	1.635***	**0.083** **	-0.068***	0.817***	-0.002	-0.009	0.069
	(0.703)	(0.000)	**(0.014)**	(0.000)	(0.000)	(0.985)	(0.622)	(0.113)
2002	536	1.099***	**0.093*** **	-0.038***	0.798***	-0.176	0.024	0.014
	(0.609)	(0.000)	**(0.005)**	(0.003)	(0.000)	(0.152)	(0.312)	(0.354)
2003	519	0.668**	**0.165*** **	-0.017	0.592***	-0.090	0.001	0.255***
	(0.309)	(0.012)	**(0.001)**	(0.240)	(0.000)	(0.680)	(0.964)	(0.000)
2004	586	0.212	**0.072**	0.011	0.732***	0.781**	-0.076	0.008
	(0.228)	(0.338)	**(0.153)**	(0.347)	(0.000)	(0.011)	(0.386)	(0.176)
2005	584	1.798***	**0.271** **	-0.046	0.255	0.543	0.082	0.013
	(0.017)	(0.006)	**(0.022)**	(0.128)	(0.197)	(0.128)	(0.502)	(0.136)

Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and * respectively.

[Table 4B] The over-investment Hypothesis: dependent variable is individual firm Tobin q

Variable	Coefficient (p-value)					
	(a) current impacts			(b) impacts after 10 years		
	1984-1988	1990-1995	2001-2005	1991-1995 All firms	1991-1995 Chaebol firms	1991-1995 Non-chaebol firms
intercept	0.358***	0.629***	0.573***	0.645***	0.507***	0.625***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Over-investment	0.002	**-0.043****	0.023	-0.002	**0.264****	-0.009
	(0.954)	**(0.004)**	(0.503)	(0.967)	**(0.049)**	(0.861)
Leverage	0.883***	0.689***	0.642***	0.207***	0.539***	0.196***
	(0.000)	(0.000)	(0.000)	(0.006)	(0.002)	(0.006)
Operating income/sales	0.271***	-0.145	0.200	0.539**	0.424	0.588***
	(0.009)	(0.111)	(0.136)	(0.010)	(0.426)	(0.009)
Capex/sales	-0.035	-0.021	-0.013	0.072	-0.203	0.079
	(0.492)	(0.510)	(0.832)	(0.441)	(0.192)	(0.387)
Number of obs.	563	1810	1465	1234	274	960
Adjusted R2	0.746	0.465	0.086	0.0169	0.0319	0.0158

Notes: Dependent variable is individual firm's Tobin q in current years in (a), and in 10 years later in (b). Individual firm Tobin Q is calculated by (market value + total debt)/total asset. Total asset and total debt are all book value. Over-investment variable is the residuals obtained from estimation of investment functions.
Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and * respectively.

Cross-subsidization Hypothesis

Cross-subsidization measure : Negative Cash-flow (i.e. EBIT < 0)
; The effect on chaebol groups' excess value by a negative cash flow variable

Table 4C] Chaebols and the cross-subsidization hypothesis: dependent variable is group-level Tobin Q

	1984-1988			1990-1995			2001-2005		
	Coefficient(p-value)			Coefficient(p-value)			Coefficient(p-value)		
	Chaebol groups		Non-chaebol	Chaebol groups		Non-chaebol	Chaebol groups		Non-chaebol
Variable	(3)	(5)	firms	(3)	(5)	firms	(3)	(5)	firms
intercept	0.803**	0.791***	0.342***	0.733***	0.729***	0.592***	0.818***	0.812***	0.535***
	(0.010)	(0.007)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
negative cashflow	0.021	0.021	0.071	**-0.024**	**-0.027**	-0.027	0.012	0.013	0.179***
dummy	(0.690)	(0.687)	(0.202)	**(0.175)**	**(0.134)**	(0.526)	(0.866)	(0.843)	(0.000)
Leverage	0.312	0.313	0.836***	0.401***	0.413***	0.763***	0.172	0.182	0.909***
	(0.348)	(0.350)	(0.000)	(0.000)	(0.000)	(0.000)	(0.476)	(0.455)	(0.000)
Operating	**-1.129****	**-1.062****	0.485***	**-0.183**	**-0.275**	-0.030	**1.037***	**1.002***	0.472**
income/Sales	**(0.038)**	**(0.014)**	(0.000)	**(0.454)**	**(0.259)**	(0.896)	**(0.096)**	**(0.094)**	(0.049)
Capex/sales	0.253	0.263	0.002***	-0.066**	-0.073***	-0.089***	0.851**	0.879**	0.027
	(0.227)	(0.208)	(0.009)	(0.014)	(0.006)	(0.000)	(0.030)	(0.017)	(0.389)
Relatedness	-0.032			0.044**			-0.029		
	(0.705)			(0.039)			(0.772)		
Number of obs.	81	81	791	162	162	2134	103	103	3994
Adjusted R2	0.054	0.064	0.660	0.126	0.108	0.555	0.076	0.085	0.449

Notes: For the chaebol group-level analysis, the negative cash flow dummy=1 when one of the chaebol's member firms has negative operating income. For the non-chaebol firm analysis, the negative cash flow indicator = 1 when the firm has negative operating income.
For the relatedness, (3) is mean cross-correlation. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and * respectively.

Debt-Capacity vs. Tax Advantages through Co-insurance Effect

Imperfect Correlation between their cash flows

↓

Able to co-insure each other's debt

↓

The debt capacity of chaebol firms should increase *!*

↓

Increasing the size of the interest tax shields

↓

Able to low tax burdens and less tax paid

[Table 6] Chaebols and the Debt-capacity

Panel A: Financial leverage summary statistics

	1984-1988			1990-1995			2001-2005		
	Chaebol firms	Non-chaebol firms	Difference	Chaebol firms	Non-chaebol firms	Difference	Chaebol firms	Non-chaebol firms	Difference
Total debt-to assets	0.754	0.718	0.036***	0.757	0.672	0.086***	0.537	0.506	0.031**
	[0.775]	[0.698]	0.076***	[0.760]	[0.660]	0.100***	[0.537]	[0.451]	0.086***
	(0.119)	(0.331)	-0.212***	(0.131)	(0.371)	-0.240***	(0.263)	(0.827)	-0.564***
Industry-adjusted leverage	0.035	0.016	0.019*	0.078	0.012	0.067***	0.060	0.054	**0.006**
	[0.051]	[0.000]	0.051***	[0.078]	[0.000]	0.078***	[0.042]	[0.000]	0.042***
	(0.109)	(0.327)	-0.218***	(0.130)	(0.363)	-0.233***	(0.271)	(0.821)	-0.550***
Number of observations	255	791		682	2135		469	3996	

Panel B: Regression result on industry-adjusted leverage

	1984-1988		1990-1995		2001-2005	
	(1)	(2)	(1)	(2)	(1)	(2)
Intercept	0.178	0.094***	-0.241**	0.123**	-0.062	0.093***
	(0.558)	(0.000)	(0.044)	(0.014)	(0.631)	(0.000)
Chaebol dummy	**0.011**	**0.004**	0.027*	0.060***	**0.018**	**0.037***
	(0.505)	(0.813)	(0.065)	(0.000)	(0.544)	(0.066)
Log of total assets	-0.005		0.020***		0.009	
	(0.767)		(0.002)		(0.229)	
Operating income/sales	-0.831***	-0.826***	-1.506**	-1.480**	-0.974***	-0.962***
	(0.000)	(0.000)	(0.019)	(0.021)	(0.000)	(0.000)
Capex/sales	-0.000	-0.000	-0.089***	-0.079***	-0.129	-0.129
	(0.923)	(0.926)	(0.003)	(0.009)	(0.395)	(0.395)
Number of observations	1046	1046	2815	2815	4458	4458
(Adj. R2)	0.037	0.037	0.113	0.109	0.045	0.045

Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and * respectively.

[Table 7] Interest tax shields and taxes paid

[Panel A]

	1984-1988			1990-1995			2001-2005		
	Chaebol firms	Non-chaebol firms	Difference	Chaebol firms	Non-chaebol firms	Difference	Chaebol firms	Non-chaebol firms	Difference
Taxes/sales	0.011	0.020	-0.009***	0.007	0.014	-0.007***	0.016	0.013	0.003*
	[0.008]	[0.015]	-0.007***	[0.004]	[0.009]	-0.005***	[0.014]	[0.008]	0.006***
	(0.011)	(0.018)	-0.007***	(0.008)	(0.018)	-0.010***	(0.027)	(0.103)	-0.076***
Industry-adjusted taxes	-0.004	0.001	-0.005***	-0.003	0.003	-0.006***	0.001	0.001	**-0.000**
	[-0.002]	[0.000]	-0.002***	[-0.003]	[0.000]	-0.003***	[0.001]	[0.000]	0.001
	(0.010)	(0.012)	-0.002***	(0.009)	(0.016)	-0.007***	(0.024)	(0.102)	-0.078***
Number of observations	255	791		682	2135		468	3996	

[Panel B]

	1984-1988		1990-1995		2001-2005	
	(1)	(2)	(1)	(2)	(1)	(2)
Intercept	0.023***	0.002**	0.013***	0.005***	0.045	-0.002
	(0.000)	(0.011)	(0.001)	(0.000)	(0.394)	(0.712)
Chaebol dummy	-0.003***	-0.005***	-0.005***	-0.006***	**0.003**	**-0.003**
	(0.005)	(0.000)	(0.000)	(0.000)	(0.579)	(0.308)
Log of total assets	-0.001***		-0.001**		-0.003	
	(0.001)		(0.035)		(0.422)	
Operating income/sales	-0.011*	-0.010**	-0.025**	-0.026**	0.109	0.106
	(0.093)	(0.050)	(0.012)	(0.010)	(0.445)	(0.447)
Capex/sales	-0.000***	-0.000	0.001	0.000	-0.031*	-0.031*
	(0.000)	(0.251)	(0.728)	(0.819)	(0.086)	(0.086)
Number of observations	1046	1046	2815	2815	4458	4458
(Adj. R2)	0.04	0.03	0.041	0.04	0.035	0.034

Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and * respectively.

Results	**1984-88**	**1990-95**	**2001-2005**
Excess value Firm-level gap with non-chaebol Group-level: median Tobin Q (firm-level ;chaebol dummy	 +* +* +*	 -* -* -	 +* +* +*
Profit stability hypothesis	Yes*/No*	Yes*	No*
Accounting profitability	Low return and low variance*	Low return and low variance*	High return and low variance*
Stock market return	High return and low variance	Low return and low variance *	High return and low variance
Over-investment (group/firm-level)	Yes*/No	Yes/Yes*	**No/No**
Performance hypothesis	- *	No	+*
Cross-subsidization hypothesis	No	Yes	Yes
Debt-capacity advantage	No	Yes*	No
Tax advantage	**Yes***	**Yes***	**No**

■ **Korean Business Groups have dramatically changed over the two decades**

1984-88	1990-95	2001-2005
Some chaebol advantage	Strong chaebol advantage	No chaebol advantage
Weaker cost of over-investment	Stronger costs of over-investment	No costs of over-investment
Negative performance impact	No performance impact	Strong performance impact
Premium	Strong discount	Strong premium
Family-owned and diversifying	Family-owned and diversified	Family-owned and diversified

■ **Summary and Concluding Remarks**

During the post-crisis period, over-investment and diversification hypothesis has no much explanatory power while cross-subsidization has much weakened,

and, more importantly, that profitability improvement is the main causes for the value premium associated with group firms.

While *profit stability hypothesis* was true for the 1990s, it was not so after the restructuring *as* chaebols boast higher profitability with less variation.

Chaebols were significantly more levered than non-chaebol firms only during the 1990s, and chaebol firm's tax shield advantages has now disappeared in 2001-2005, whereas there were some in the pre-crisis period.

<u>Implications:</u>

Not true: Agency cost view: same governance but different/better performance

Not true: market failure view: market maturing but turning to premium

Nature of the firms in emerging economies

= very dynamic and ever-evolving nature

Explaining Performance Change of Chaebols Before and after the Crisis: Technological capabilities vs. Investment Inefficiency

To prove resource-based view
(EDCC 2009)

3 Alternative Chaebol definitions

1) Top 30 business groups in terms of asset size

2) Among the top 30 business groups, select only those satisfying
(affiliates' share)/(owner's share)
> 0.7 => termed, CMS 1

3) owner' share < 20% => CMS 2

=> Criteria: Productive efficiency estimated from frontier production function

Productive Inefficiency comparison (CMS 1)

	period	coefficient	non-chaebol (A)	chaebol (B)	difference (B-A)	inferior chaebol (C)	superior chaebol (D)	difference (C-A)	difference (D-A)
CMS1 chaebols	85-89		**2.575**	**2.861**	**0.286**	**3.457**	**2.351**	**0.882**	**-0.224**
		t-value	147.57		6.24			11.76	-8.05
		[p-value]	***		***			***	***
	90-97		**4.596**	**4.663**	**0.067**	**5.263**	**4.297**	**0.667**	**-0.299**
		t-value	256.57		1.65			7.76	-13.76
		[p-value]	***		*			***	***
	00-03		**2.989**	**2.246**	**-0.743**	**2.843**	**1.719**	**-0.146**	**-1.270**
		t-value	221.12		-18.09			-4.27	-35.26
		[p-value]	***		***			***	***

1. The t-values are obtained using White's formula.
2. Positive value of "difference" means that chaebols are less efficient than non-chaebol firms ; using CMS 1 crteria

2 Causes for the Changes: Chaebol vs. non-Chaebol

(1) over-investment:

use residual from the investment function in the determinants of productive inefficiency equation

-> bootstrapping estimation and Hausman-Taylor

(2) technological capabilities:

patent counts and diversification

Chaebol vs. non-Chaebol over-investment, patents, etc

	period	non-chaebol (A)	chaebol (B)	difference (B-A)	t-statistics (p-value)
Residual from Investment Function	85-89	1.37	5.94	4.57	2.05** (0.040)
	90-97	2.01	5.38	3.37	2.42** (0.015)
	00-03	1.81	0.49	-1.32	-1.23 (0.218)
Patents	85-89	0.94	40.76	39.82	2.73*** (0.007)
	90-97	3.92	240.00	236.08	3.55*** (0.000)
	00-03	10.33	215.60	205.60	2.97*** (0.003)
Size	85-89	9.20	10.61	1.41	14.80*** (0.000)
	90-97	9.41	11.19	1.78	27.59*** (0.000)
	00-03	9.45	11.48	2.03	23.80*** (0.000)
Diversity	85-89	0.35 [0.55]	1.04 [1.27]	0.69 [0.72]	7.20*** (0.000)
	90-97	0.47 [0.73]	1.23 [1.37]	0.76 [0.64]	14.72*** (0.000)
	00-03	0.44 [0.65]	1.13 [1.29]	0.69 [0.64]	10.50*** (0.000)

Determinants of Productive Efficiency 1

Over-investment tendency was stronger among the Chaebol firms during the first two periods, whereas it became weaker after the 1997 crisis.

->smaller investment inefficiency among the Chaebol firms explains the higher productive efficiency of the Chaebol firms after the crisis.

Determinants of Productive Efficiency 2

"Technological capabilities measured by Patent applications and/or technological diversification," were not significant for the pre-crisis period but became more significant after the 1997 economic crisis.

->Higher technological capabilities contribute to higher productive efficiency in the post-crisis period.

Summary and Conclusion

Korean Chaebols in the 1990s suffered from productive inefficiency arising from inefficient investment drives.

Failure of many Chaebols before and during the crisis period implies that only those Chaebols that have succeed in curtailing investment inefficiency and building new technological capabilities have survived the crisis.

-> proving the resource-based view

Law of eventual decline of BGs with market maturing? : right and wrong

* A need to restate the thesis of institutional or market imperfection in predicting performance;

-> While market maturing have affected the performance of BGs, some survived the environmental challenges while others not.

=> No general "law" of long term decline of business groups with market maturing.

⇒ But importance of continuing evolution of firms & firm-level response to environmental changes

eg.) Seo, Lee, Wang (2010: ICC) on Chinese BGs: firm-level vs. market-level factors;
firm-level variables (agency costs) more important & robust

Performance Change of Business Groups in China

(a) Cofficients of Group dummy from Yearly OLS

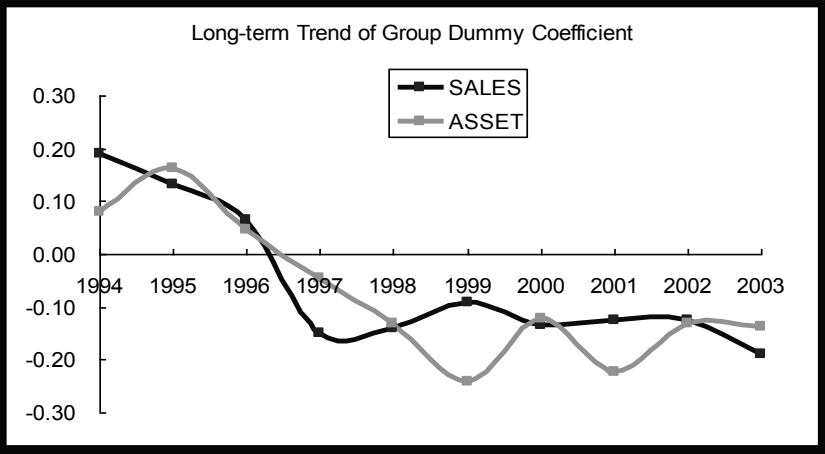

Table 14A: Determinants of Group Discount:
Overall with group firms defined as having 2 or more subsidiaries

	(A) EXCESS (SALES)			(B) EXCESS (ASSET)		
Regression	**OLS**	**FIXED**	**RANDOM**	**OLS**	**FIXED**	**RANDOM**
Group	-0.119	-0.082	-0.100	-0.070	-0.061	-0.073
Dummy	(-3.01) **	(-1.79) *	(-2.39) *	(-2.82) **	(-2.34) *	(-2.88) **
INSTIT *	0.002	-0.008	-0.005	0.003	-0.012	-0.006
Group Dum.	(0.12)	(-0.56)	(-0.37)	(0.42)	(-1.61)	(-0.76)
DIVER *	**-0.029**	**-0.027**	**-0.034**	**-0.026**	**-0.014**	**-0.025**
TIME	(-2.96) **	(-3.14) **	(-4.02) **	(-4.45) **	(-2.94) **	(-5.07) **
LONGINV *	-0.011	-0.011	-0.013	**-0.013**	-0.009	**-0.011**
TIME	(-0.87)	(-1.02)	(-1.24)	(-1.71) *	(-1.46)	(-1.78) *
INSTIT	0.028	0.157	0.069	0.026	0.179	0.080
	(2.31) *	(7.09) **	(4.61) **	(3.36) **	(14.53) **	(8.76) **
DIVER	0.157	0.222	0.226	0.075	0.104	0.152
	(2.56) *	(3.31) **	(3.79) **	(1.98) *	(2.85) **	(4.31) **
LONGINV	0.154	0.151	0.169	0.127	0.070	0.096
	(1.48)	(1.63)	(1.87)	(2.08) *	(1.37)	(1.83) *
TIME	0.010	-0.051	-0.004	0.029	-0.023	0.018
	(1.46)	(-4.33) **	(-0.54)	(6.77) **	(-3.62) **	(4.01) **

(note: Coefficients of other controls not shown here)

Summary on Chinese BGs

- **Literature on BGs:**

They emerge when there is market imperfections (high transaction costs);
So, they will disappear/decline with maturing of market institutions.

- **In China, there was similar decline of premium of BGs -> Why**
- **Weaker evidence: Market Institution Development;**
- **Stronger evidence:**
  1) Increasing Market Competition/ Diversification Costs;
  2) agency costs/Tunneling Problems

Imply: market failure hypothesis is not true:
(market institutions cannot change in such short time)
Consistent with the Korean chaebols: post-crisis turn-around with fully open market environment)
Conjecture: Chinese BGs also might turn around like Korean chaebols; (advantage of resource sharing and so on)

Question?

What are the advantage of BGs, which is not subject to market failure,

=>"Theorizing the Behavior of the Business Groups: A Dynamic Model and Empirical Evidence (JEBO 2010)

From Agency Costs to Resource-sharing advantages

Business groups have resource-sharing advantages.

The importance of this feature stems from the fact that this advantage need not disappear even with the development of free market institutions.

Chang and Hong (2000) who, using 1990s data, find that Chaebol firms tend to be associated with superior financial performance (profitability) due to group-level sharing of technology skills, advertising, and internal transactions.

Purpose of the Study

- To develop a formal model of business groups in light of Penrose's resource-based theory of the firm.
- To draw theoretical predictions about business groups behavior and performance relative to stand-alone firms.
- To provide empirical evidence using the Korean data.

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Edith Penrose (1959),
A Resource-based View of the Firm Growth

Developed into:
capability based theory of the firm,
knowledge based theory of the firm,
and evolutionary theory of the firm

'The Legacy of Edith Penrose' (Pitelis 2002),
40th year anniversary of the Penrose book

Origins of our idea: from the Penrose (1959;95)

*Indivisibility:

"resources are only obtainable in discrete amounts (p. 67)."

"the least common principle"

-> "If a collection of indivisible resources is to be fully used, the minimum level of output at which the firm must produce must correspond to the least common multiple of the various maximum outputs obtainable from the smallest units in which each type of resources can be acquired." (p. 68)

Basic Idea of the Model

There exists a "lumpy" input that cannot be traded in the market, such as Brand or R&D facility.

* Existence of such inputs gives business groups a distinctive advantage vis-à-vis stand-alone firms **since the affiliates can share the costs of acquiring such inputs and the usage of that resources.**

*** It is shown that such advantage exists regardless of market failures (cf. other papers).**
-> A stand-alone firm's disadvantage stems not from its incapacity to get external financial arrangements but from its inability to acquire the wanted amount of the asset in the markets and/or utilize the resources to the optimal level (underutilization; cannot be leased on markets).

Lumpy input as a primary input

- Makes production capacity change only in discrete increments.
  - ⇒ Dynamic process of such expansion is in line with the development path of a Penrose's resource-based firm.
- Differentiates business group firms and stand-alone firms.

45

Lumpy input as a primary input

- Makes production capacity change only in discrete increments.
  - ⇒ Dynamic process of such expansion is in line with the development path of a Penrose's resource-based firm.
- Differentiates business group firms and stand-alone firms.

45

Prediction from the model on behavior of BGs

1) A BG charges a lower price than a stand-alone firm.
2) A BG produces a higher quantity than a stand-alone firm.
3) A BG invests more than a stand-alone firm.
4) A BG firm earns more profit than a stand-alone firm.
5) A BG has a higher profit margin on sales (ROS) than a stand- alone firm.
6) A BG has a lower profit-to-investment (ROE) ratio

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<Table > A) random effect model(outliers excluded)

dependent variable		Operating income/ Assets	Operating income/ Sales	Assets Growth	Sales Growth	Capital/ Labor
cons.	coef.	5.10	4.02	8.62	6.57	49.67
	z-value	5.37	3.59	3.68	2.96	1.80
		***	***	***	***	*
BG.	coef.	0.12	0.92	3.75	5.30	97.61
	z-value	0.30	1.99	3.90	5.80	8.57
			**	***	***	***
age	coef.	-0.03	-0.02	-0.12	-0.13	0.25
	z-value	-2.15	-1.10	-3.62	-4.03	0.62
		**		***	***	
R-sq	within	0.0000	0.0000	0.0000	0.0000	0.0000
	between	0.2036	0.3251	0.1165	0.2131	0.3046
	overall	0.1107	0.1890	0.0240	0.0384	0.2546

Prediction from the model on behavior of BGs

1) Chaebol firms are more capital-intensive than non-Chaebol firms.
2) Chaebol firms grow faster than non-Chaebol firms in asset and sales.
3) Chaebols: higher ROS (return on sales) and similar ROA (return on asset)

⇒ All consistent with the model prediction

Japanese BGs: M. Aoki, 2012, Corporations in Evolving Diversity

	J-Firm	Hybrid 1	Hybrid 2	K-Firm
Ownership	high inter-firm	Low Inter-firm	High inter-firm	Family+inter-firm
	Low foreign	High Foreign	Low Foreign	High Foreign
Finance	bank	capital market	bank	Capital Market
Labor	Life time	Life /long term	shorter term	No long term
Incentive	Seniority	Seniority	Merit-based	Merit-based
Performance	Low	High	Medium	High
Management	Consensus	Consensus	In-between	Top-down

Korean BGs after 1997 crisis = Korean Head + A-firm Body
= Long term, quick decision-making and strong execution (with global and open looks)
= (market based financing and incentiveds but still fmaily ownership with foreing shares increased

Aoki's prediction (p. 157) maybe wrong: Hybrid 1 and 2 might be only transition step toward A-firm (eg. Layoff by Hybrid 1 firms like Panasonic and Sharpe.
In other words, H-1 maintianed life time job due to its good performance; but without this, cannot maintain; eg recent Panasonic

K-firm: 2 top system: Even with incapable ownership, OK if they pick up capable CEO under strong incentive contacts with long term oritentation imposed by the owner.
K-firm ; 2 tier of strong incentive: between Owner and CEO; between Ceo and workers.

Aoki's tend to ignore technology side in his framework; - thus miss the importance of digital revolution which made tacit knowlede (implicit information assimilation or MCA(managers cognitive asset) and WCA) of J-firm less important; thus,

K-firm looked for way not to rely on WCA;
eg Hyundai: use of automation,
Samsung: strong incentive & open sourcing of knowledge.
-> this got additional help from digital revolution which made tacit knolwedge less important;
OK without it
And concentrated on a few strategi c areas.

Now,
let us try to conclude

Understanding BGs with 3 Theories

1) Market Failure View-> Origins of BGs in EEs

2) Agency Costs (CMS; Governance) View
-> good at explaining (short run) performance
(in the 1990s)

3) Resource-based View
-> long term (fundamental) performance,
regardless of market failure
->corporate governance cannot explain
all aspect of performance

**** regardless of State-owned or family owned BGS**

Overall Remarks

1) Firms and BGs keep evolving; any judgment based on specific time period should be taken with caution
2) Its Evolution = Internal Inertia + External Shocks/intervention
3) So, BGs still seem to be an useful forms of economic organization in terms of its competitiveness, such resource sharing, intangible asset, & entry devices, which are not to disappear with market maturing

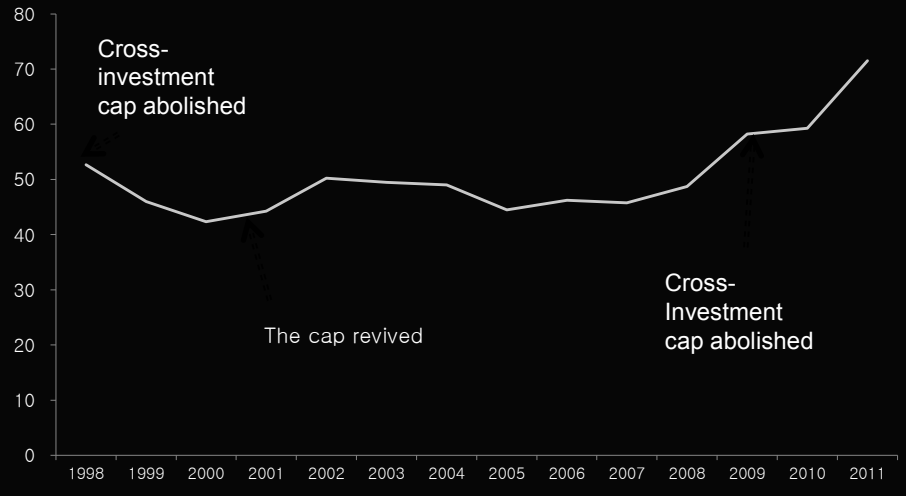
4) In general, firm-level factors more important than environment-level factors (institutions)

Emerging /Remaining Issues

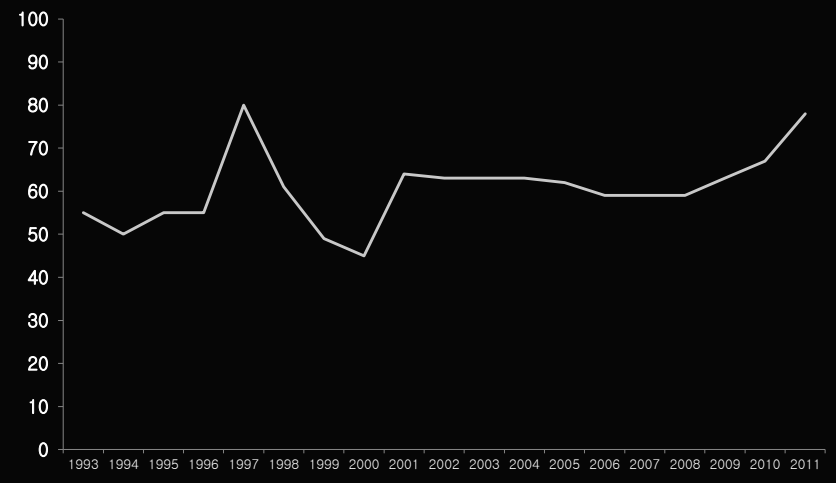
1) Recent Evolution of BGs in Korea
2) full understanding of :
Korean firms = BGs + family firms (aggressive decision-making)
3) Chinese firms
= BGs + state-owned enterprises
(Performance rebound?)

Recent Evolution of BGs in Korea = neither much specialized nor less No. of affiliates but keep expanding (at least until recently)

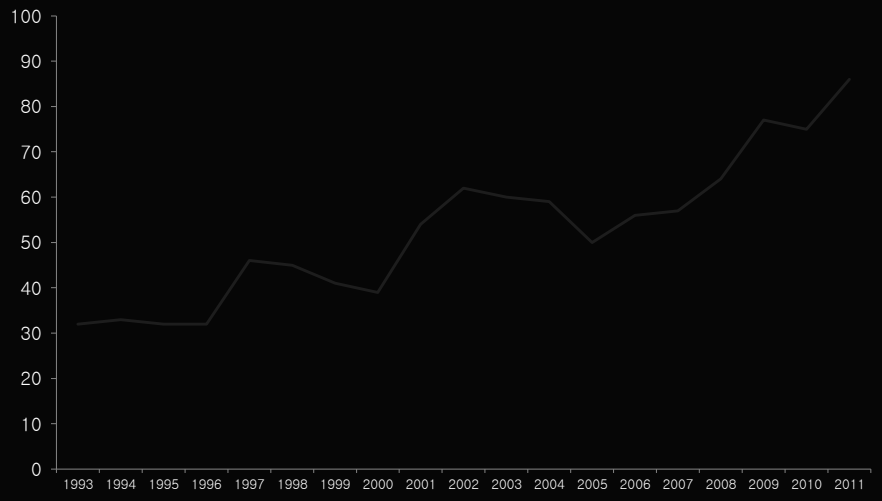
The average number of affiliated firms of 4 business groups: 1998-2011 (samsung, LG, SK, Hyundai motors)



No. of affiliates, Samsung group, 1993-2011



No. affiliates , SK group: 1993-2011



Continuing diversification = a puzzle

why: maybe due to existence of owners who keep looking for new sources of growth;

Next issue:

Role of the foreign shareholders"
ex) Samsung vs Eliott case in 2015

Current Corporate Governance in Big business in Korea

•Since the 1997 crisis,
a combination of East & West 外西內東.
- Co-existence of large portion by foreign investors and another controlling
shares by owner's family..
-- Rise of Shareholder capitalism -> voice for dividend
-> sources for high profit but lLow-investment & thus Low-growth

** Alternatives :

1) Short-term shareholders to be given either Dividends rights or Voting right but not both;
-Otherwise, too much voices by short term shareholders, which make impossible the aggressive investment, like Google

2) Such scheme should be allowed
at IPO or SMEs/Startup as in USA

Voting rights by founding shareholders in US IT companies: (stable /dominant voting rights with Dual Class Stocks)

2013.4	Initial Public Offering	Share Outstanding	holding of founder (share of voting rights)
구글 Google	2004.8.19	Common Stock A(1주1의결권): 270,987,899 Common Stock B(1주10의결권): 60,722,225	Common Stock A: 93,420 Common Stock B: 49,263,925 (56.1%)
링크드인 Linkedin	2011.5.19	Common Stock A(1주1의결권): 91,400,638 Common Stock B(1주10의결권): 18,887,435	Common Stock B: 17,073,237 (60.9%)
질로우 Zillow	2011.7.20	Common Stock A(1주1의결권): 27,208,820 Common Stock B(1주10의결권): 7,268,626	Common Stock B: 7,268,626 (72.8%)
그루폰 Groupon	2011.11.4	Common Stock A(1주1의결권): 658,824,902 Common Stock B(1주150의결권): 2,399,976	Common Stock A: 196,198,554 Common Stock B: 1,399,992 (54.6%)
징가 Zynga	2011.12.16	Common Stock A(1주1의결권): 606,894,493 Common Stock B(1주7의결권): 165,808,221 Common Stock C(1주70의결권): 20,517,472	Common Stock B: 74,085,846 Common Stock C: 20,517,472 (61.0%)
페이스북 Facebook	2012.5.18	Common Stock A(1주1의결권): 1,740,598,009 Common Stock B(1주10의결권): 670,450,341	Common Stock A: 1,939,987 Common Stock B: 607,599,549 (67.2%)

If there are many founders, all those people are included not including other high mangers and board members. (Sources: EDGAR)

The latest issue of the Economist (8/15, 2015): Conglomerates are back in the United States

- Google: Officially a Conglomerate (Alphabet) on 8/10
  → Two reasons = Technology & profits:
  - IT will change the business method in all industries.
  - to invest in several new businesses than to consume profits as dividends (Automatic vehicles; Schmeat; Smart homes; Space development)
  - New businesses and technological convergence=> conglomerates (business groups.
- The vision of GE (Thomas Edison): Electricity will change all industries
  - Berkshire Hathaway (Warren Buffett) ; Elon Musk of Tesla: Electric car, Space travel, Solar energy; Amazon (Server farms, Drones); Facebook (virtual reality equipments)
- W. Lazonik, W. Milberg (New School):
  - In 1950-60s , the U.S. was also industrial capitalism.
  - But since 1980s, financial capitalism gained power.
  - After that, Short-term profits, Dividends → Overseas factory.

Is Stock market funding firms or not?
More outflow with treasury stock purchasing or dividends payments

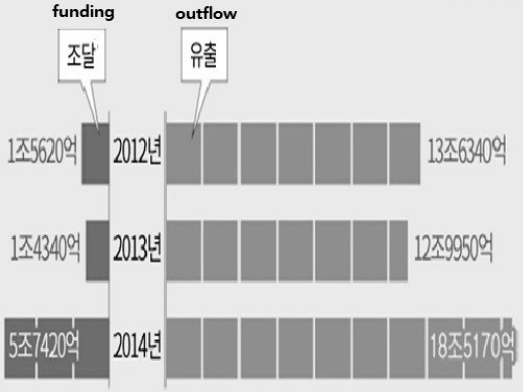
Delisted companies from domestic stock market

Companies	Industry	Year
SKbroadband	Telecomm.	2015년 6월
3 Nod Digital	IT-devices	2013년 5월
Ko-one Energy	town-gas	2012년 10월
Irevo	Door Lock	2009년 1월
Auction	Internet Shopping	2004년 11월

Sources: Financial Supervisory Service

Funding and outflow of Listed companies from Domestic market

unit: won



Sources: The Federation of Korean Industries

Thank you!

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Can the Property Rights Theory Explain Cross-border Vertical Integration of Multinational Firms? Firm-level Evidence in Korea

Hyunbae Chun