

Financial System, Corporate Diversification and
Technological Catching-up:
South-Korea; an imitator to innovator

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Research Motive

Schumpeter emphasized (1943) that those who are starting “new things”, or innovating need to be provided with “profits for above what are necessary in order to introduce the corresponding investment” He argued that entrepreneurial profits (or quasi-rents) may some time be provided by the difficulty of imitating the new technology (or organization), but sometimes would have to be secured through “restraints of trade” like cartel arrangements. The thrust of Schumpeter’s argument is then that entry barriers of one form or another are necessary to provide incentives for innovation because it means doing “new thins”.

While, Chang H. J. (1993) is of this opinion that establishing an industry in a developing country may not involve doing anything “new” from a global point of view, but poses a similar incentive problem, because it still is a “new thing” for that nation.

Therefore this study probes Korean industrial Strategy from a Distinct angle of financial system and financial sector policies as an imperative determinant of technological catching-up.

Corporate Diversification: Why firms diversify their product portfolio?

Gort (1962) defined diversification in terms of the concept of 'heterogeneity of output' based on the number of markets served by that output.

To Berry (1975) diversification represents an increase in the number of industries in which firms are active.

Hopkins (1985) defined diversification as the extent to which firms operate in different businesses simultaneously.

Ansoff's (1957, 1965) notion of variety emphasizes the entry of the firms into new markets with new products.

Booz, Allen, and Hamilton (1985) defined diversification as a means of spreading the base of the business to achieve improved growth and / or reduce overall risk.

Bailey and Friedlander (1982) Concerning economic performance, major rationale for diversification is economies of scope.

While most recent attempts at defining variety or diversification have roots in Neo- Schumpeterian Economics.

It is defined as 'the number of actors, activities, and objects necessary to characterize the economic system'. Hence it represents qualitative change in the composition of an economic system.(Saviotti P.P. 2001)

Few empirical studies [Frenken et al (2007), Savoitti , Franken (2008), Hidalgo et al (2007), Michael Funke and Ralf Ruhwedel (2001 and 2001 b)] confirm that producing highly differentiated export goods gives a competitive advantage which allows selling more products in international market. Because the marginal utility of adding a new good to the pre-existing pattern of consumption is greater than that of adding an extra unit of a pre-existing good (Savoitti p p).

For the purpose of this study variety/ product Diversification is defined as, the degree of differentiation of industrial output of an economic system at higher level of aggregation.

In the broader sense variety can be subdivided into two categories.

- 1) Related Product Variety
- 2) Unrelated Product Variety

Corporate Diversification and Export led Technological Catching-up in Korea.

The diversified business groups “*Chaebol*” are found in South-Korea like Japan, India, Taiwan, Brazil, Turkey, and other late industrializing countries.

1) Japanese Colonialization

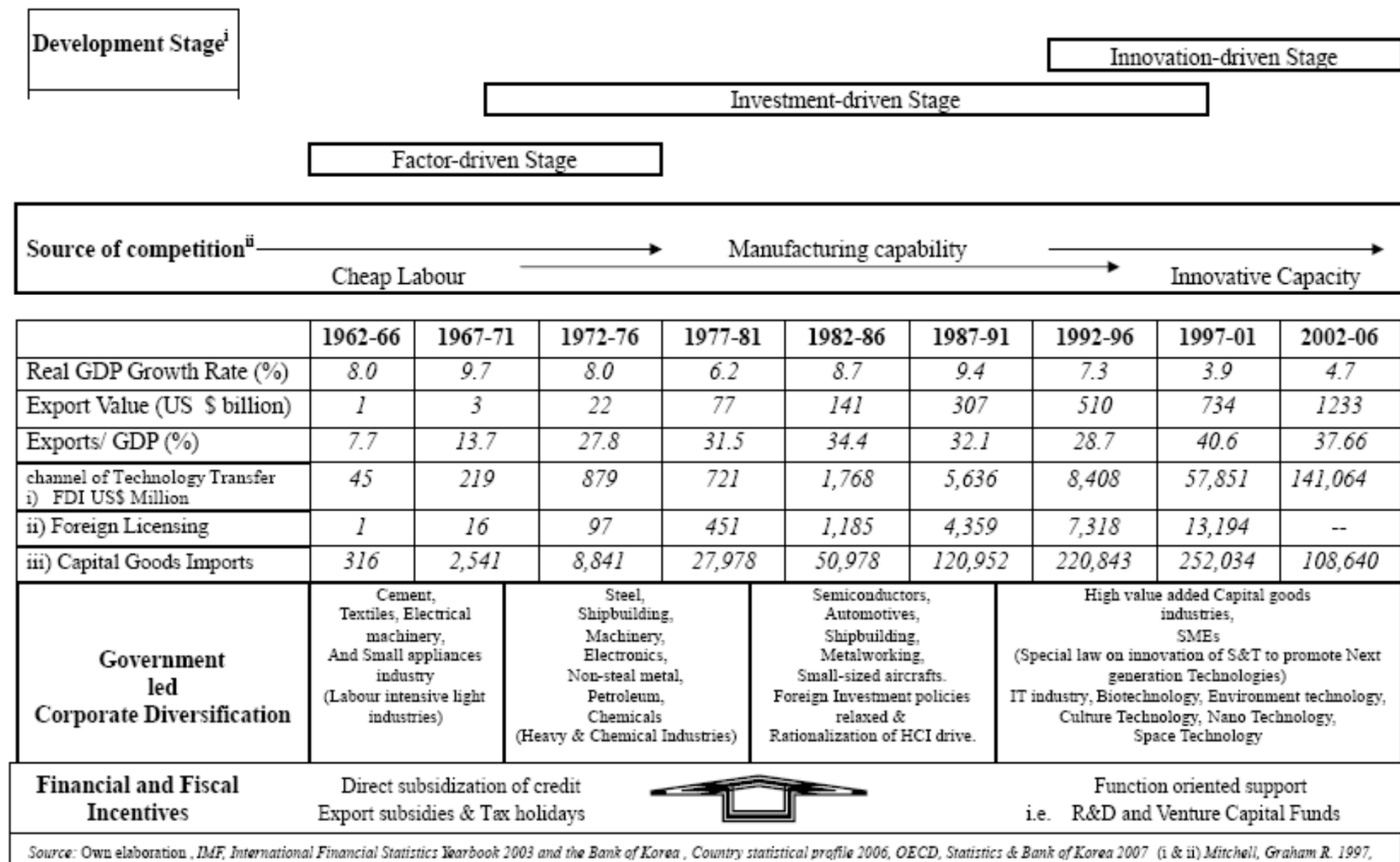
2) Origin of Diversified Corporate Groups in Korea (1953-58)

During this period political connections lead to uneven distribution of wealth, major industries to which these enterprises thriving on venality included textiles, paper, housing, mining, fertilizers, flour, alcohol, glass, pottery, livestock, construction, warehousing, and Trade. These subsidised entrepreneurs were generalists, devoted to money making in whatever industry the opportunity arose.

(Government Audit report 1961, A. H. Amsden)

3) Park C. H's Control over Banks through Nationalization (1961)

Economic Growth ,Technological Catching-up and Corporate Diversification in South-Korea



Korean Chaebols in related & unrelated business activities to realize perceived profits

From 1981 to 1986 there were 1,136 reported cases of Chaebol beginning to own new businesses. Among these the number of horizontal integrations (intra-industry) was 324 (28.5% of the total), that of vertical integrations was 215 (19.9% of the total), and that of diversifications into other industries (inter-industry) was 597 (52.6% of the total). The methods of expansion included acquiring stocks, establishing new companies, mergers, acquiring management participation, and acquiring business rights.

According to A. H Amsden, Korea's business groups may have diversified widely because they had no technical expertise to build upon in related products or in higher quality product niches. Their widely diversified structures complemented their strategy to compete at the bottom end of many markets. In their diversification efforts, they had the full support of the government because the government's vision of industrialization was fixated on bigness, and bigness and diversification overlaps.

Corporate Diversification of 10 Largest Business Groups in Korea

(As of April 1st 2003, trillion won, number)

Rank	Business Group	Total Asset	Affiliates	Type of Group
1	Korea Electric Power Corp.(KEPCO)	92.1	13	both A and B
2	Samsung	83.5	63	"
3	L G	58.6	50	"
4	S K	47.5	60	"
5	Hyundai Motors	44.1	25	"
6	K T	30.8	10	"
7	Korea Highway Corp.	28.3	3	"
8	Hanjin	21.0	23	"
9	Lotte	20.7	35	B
10	POSCO	20.5	15	"

Note:

A type (17 Groups): limit their total equity investments

B type (49 Groups): limit cross shareholdings and cross-debt guarantees.

Source: KFTC (2003).

Combined Sales of Top Ten Chaebols as Percent of GNP*

Groups	1974	1984
1	4.9	12.0
2	7.2	24.0
3	9.0	35.8
4	10.3	44.3
5	11.6	52.4
6	12.7	56.2
7	13.5	59.4
8	14.3	62.1
9	14.7	64.8
10	15.1	67.4

* *Average net sales of the largest ten business groups/ GNP x 100 for each year*

Source: Seok Ki Kim (1987) reproduced in A.H. Amsden (1989)

Degree of Unrelated Diversification of Chaebols

The leading Korean Chaebols comprise major divisions that have no relation to one another whatsoever: e.g.

- 1) Consumer electronics and petrochemicals in the case of Lucky Goldstar.
- 2) Finance, construction, cement manufacturing, shipbuilding, shipping, steel structures and heavy machinery in the case of Hyundai.
- 3) Consumer electronics, heavy machinery, finance, broadcasting, a daily newspaper, and entertainment in the case of Samsung.
- 4) Tourism industry business, an airline, a bus line, and a travel agency in the case of The Hanjin group.
- 5) The KIA group makes vans and the machine tools that are used in their manufacture.
- 6) The Doosan group makes bottling equipment and owns a bottling franchise.

Continuity in ownership and control contributed to a uniform group culture and a centralized knowledge of group resources. Both facilitated the intra-group transfer of money and personnel. Therefore an economy of scope arose in the form of the capability to diversify.

Financial System & Korean Industrial Strategy.

During the 1960s to the 1980s, Korean commercial banks were controlled by the Ministry of Finance, and interest rates were regulated and policy loans were often directed towards specific, mostly export-related, industries. Even currently, a few types of financial incentives, such as export insurance, are still being used for the purpose of export promotion.

1) Policy Loans: Government control of interest rates provided the strategic industries with preferential access to capital at substantially subsidized interest rates. During the 1970s, preferential loans increased from less than 40 percent of total bank lending in 1971 to over 55 percent during 1976-77 and almost 70 percent in 1978.

Real interest rates of such policy loans were, in general, negative during the 1970s, although they remained positive during the 1980s and the 1990s. As a result of the HCI Drive in the 1970s, the HCI sector not only had better access to capital, but also faced much lower average borrowing costs i.e. 36% lower as compared to other sectors.

Similarly, Export industries also enjoyed preferential access to capital. Their average borrowing cost was in general lower than that of other industries, from the 1970s to the 1990s, except for few years.

2) Export Finance

Exporters received enormous interest rate subsidies from the 1960s to the 1980s, For instance, during 1966-1972; the interest rate for export finances was 17 percent lower on average than the general lending rate. In 1985, to increase the production capacity of export industries, the government announced they would lend as much as necessary for expanding the production capacities of export industries. The average interest rate applicable to export finance was five percent during 1995-1997 and three percent during 1998-1999, which was lower than the market average lending rate of 9-19 percent in 1995 and 8.5--20 percent in 1999.

The Korea Export-Import Bank, which has been funded by the government, has lent exporting firms up to 90 percent of the contracted value of exports. Later in 2002, the government introduced the Act for the Export-Import Bank of Korea, which enabled it to undertake risks that commercial banks were reluctant to assume.

3) Export Insurances

The Export Insurance Fund was established to support those export insurance programmes which were running on behalf of the government through the Korea Fire Re-Insurance Corporation during 1969--1976 and then Korea Export-Import Bank for 1977-1992. Foreign Investment Insurance was added in 1972 to insure against losses due to political risks accompanying foreign direct investment outflows. During 1968-1972, the value of exports supported by export insurance, i.e. the utilization ratio of export insurance, was as low as 0.8 percent. It remained approximately 3.0 percent during the 1980s.

Since 1980's the government began emphasizing on indirect export subsidization, because direct export subsidization was prohibited as a result of the Uruguay Round negotiations.

The KEIC, Korea Export Insurance Corporation, was established by the government in 1992 as the exclusive export insurance provider in Korea, replacing the Korea Export-Import Bank. Afterwards Korea emerged as one of the heaviest users of the export insurance System.

Utilization of Export Insurance and Loss Ratios in Korea, 1969-2003

The Export Insurance Act requires the Export Insurance Fund to finance the insurance programmes if the KEIC incurs budget deficits, adding financial security to the export insurance system.

The government has contributed as much as equivalent to US\$ 2 billion, during 1969—2002 to the Export Insurance Fund.

(Units: US\$ 100 Million, %)

Year	Export Value (A)	Insured Amount (B)	Premium Received (C)	Claims Paid (D)	Recoveries Ratio (B/A)	Utilization loss	Utilization Ratio (D/C) %
1969-73	81.2	0.7	n.a	n.a	0.000	n.a	0.8
1974-76	182.5	1.5	0.013	0.006	0.000	41.4	0.8
1977-79	382.3	8.0	0.038	0.022	0.002	56.5	2.1
1980-82	954.3	48.2	0.160	0.037	0.002	23.4	5.1
1983-85	1,053.9	42.5	0.280	0.062	0.006	22.1	4.0
1986-88	1,482.5	20.6	0.194	0.112	0.024	57.6	1.4
1989-91	2,115.2	49.6	0.143	1.546	0.016	1,082.9	2.3
1992-94	2,705.8	118.2	0.771	1.449	0.105	187.9	4.4
1995-97	4,249.1	436.9	0.802	2.499	0.669	311.6	10.3
1998-00	4,653.7	573.7	1.163	10.540	3.164	906.3	12.3
2001-02	3,129.1	631.8	1.366	5.441	0.427	398.3	20.2
2003	1,942.7	421.0	n.a	n.a	n.a	n.a	21.7

Notes: Export values (A) denote the aggregate income that results from commodity exports and from overseas construction. Claims paid (D) is based on the year paid, not the year underwritten; n.a.: not available, (a): during 1974-2002. Sources: KEIC, *Annual Report* and *Monthly Export Insurance*, various issues.

4) Corporate Procurement Loans Scheme

In Korea, business firms had large use of commercial bills for the settlement of commercial transactions. This practice, however, caused problems because SMEs, which had received commercial bills, had to wait for a considerable time before they could obtain cash settlement in full, aggravating their financial burden. The default of a company that had issued commercial bills ran the risk of causing a chain of defaults by those companies having received or accepted them.

Therefore, The Bank of Korea introduced the corporate procurement loans scheme in May 2000. Which is a new procedure for the settlement of commercial transactions under which corporations purchasing goods borrow settlement funds from banks, paying the suppliers in cash rather than commercial bills.

The scheme was swiftly established and the outstanding balance of loans extended under the this scheme surged from 65 billion won at the end of June 2000 to 3.3 trillion won at the end of December 2000. While the number of corporate beneficiaries of the scheme also soared from 135 to 5,458 during the same period.

5) Corporate Financial Gurantee System

The Korea Credit Guarantee Fund (KCGF) and The Korea Technology Credit Guarantee Fund (KTCGF) were established in 1976 and in 1989, respectively, to increase the availability of loans for the establishment, expansion and improvement of business. KCGF and KTCGF provide lenders with a guarantee against losses incurred on loans. This support to lenders helps firms that do not have the tangible collateral to obtain debt financing. They provide guarantees for bank loans, bonds, commercial bills and leasing.

The government contributed \$2 billion consisting of loans from ADB and the World Bank to KCGF and KTCGF in order to enlarge loan guarantees to SMEs and venture businesses. The outstanding balance of credit guarantees extended by these funds surged from 4,105.5 billion won at the end of 1989 to 31,496.7 billion won at the end of June 2000.

Corporate Loan Guarantee, top 30 Korean Chaebols

(trillion won)

year	Equity	Loan Guarantee	Loan Guarantee/ Equity	Guarantee top 3/Total Guarantee
1995	50.7	48.3	95%	84%
1996	62.9	35.2	56%	86%
1998	70.5	33.1	47%	83%

Characteristics of corporate Loan guarantee institutions in Asian Countries

Rational for guarantees

Without the government's implicit support for financially distressed firms and banks, the guarantor firms would face weaker incentives to engage in loan guarantee contracts and the banks would not trust loan guarantees made by a weak guarantor firm. The govt. therefore acted as an additional element affecting the credibility and hence the endorsement of a loan guarantee.

The importance of these institutions in the economy and financial system can be gauged by the ratio of loan guarantees outstanding to GDP i.e. above 5% of GDP in case of Korea

Country	Institution	Coverage Ratio	Guarantee Fee ¹	Maximum (Actual) Leverage Ratio
Korea	KCGF	70-90% (Usually 85%)	0.5-2% (risk-based)	20 (9.8, end-2005)
	KTCGF	70-90% (usually 85%)	0.5-2% (risk-based)	20 (14.4, end-2005)
Japan	JASME	70-80%	0.87%	No maximum (19.1, March 2005)
	CGCs	100%	1.25%, 2 1.35% ³	35-60 (18.6, March 2005)
Indonesia	Perum Sarana	Max 75%	0.5-1.5% (risk-based)	20 (22.2, end-2004)
	Askindo	50-70%	0.8-2%	-- (6.9, end-2004)
Malaysia	CGC	30-100%	0.5-2%	No maximum (4.3, end-2005)
Taiwan, (China)	SMEG	70-100% (usually 80%)	0.75%, 1%, 1.25%, 1.5% (risk-based)	20 (20.6, end-2005)
Thailand	Thailand SICGC	Maximum 50%, or 50% of actual loss ⁴	1.75%	5 (4.6, end-2005)

1 Per annum. 2 With collateral. 3 Without collateral. 4 Depending on facilities.

Sources: ACSIC questionnaires; individual annual reports; BIS calculations.

Financial Crisis 1997 – Blessing in disguise

As far as cause analysis is concerned financial market liberalization that was pursued throughout the mid-1990s, weak risk management system of Korean Banking Industry, continued erosion of the Korean economy's international competitiveness, massive capital outflow, denied rollover of short-term external debt, Heavy corporate debt leverage, large amount of non performing loans of Chaebols, domestic wage hikes, the appreciation of the Korean won, and Southeast Asian Currency crisis are considered to be the main reasons of Korean Financial crisis of 1997.

Bottlenecks appeared in the old methods and system of Korea which has yielded a lot in its development phase. Therefore Government took the advantage of these crisis and reformed the economy on massive scale on the following axis.

- 1) Transformation of Korea into a market oriented economy
- 2) Improvement in the institutional regime
- 3) Transition to knowledge based economy

Korean Government & Non performing Loans

The Korea Asset Management Corporation was set up in December 1997 which has settled NPLs worth 35 trillion won (US\$32.1 billion) and recovered 18 trillion won (US\$16.2 billion). Further, the government initially decided to provide 64 trillion won (US\$57.6 billion) in public funds, but made fresh allocations, so far pumping 89.6 trillion won (US\$107.7 billion) in public funds into the banks and non-banking financial institutions.

Public Fund Injected 1997- 2007

(Trillion Won)

Source	Support Type	Total
Korea Deposit Insurance Corporation	Recapitalization	50.8
	Compensation for losses	18.5
	Purchase of assets	11.0
	Repayments of deposits	30.0
	Subtotal	110.6
Korea Asset Management Corporation	Purchase of NPLs	38.8
Fiscal Resources	Recapitalization	11.8
	Purchase of subordinate debentures	6.3
	Subtotal	18.1
Bank of Korea	Recapitalization	0.9
	Grand total	168.3

Source: Financial system in Korea, Dec 2007, Bank of Korea.

South Korea achieved positive results through powerful government intervention and initiatives as there was no other effective option to solve NPLs problem. Therefore the NPL ratio reduced up to 0.67% as on end of June 2007 which is not even below to the average among US commercial banks (0.87% as on end of June 2007) but also well below the corresponding figure for the world's largest (top 30 banks in terms of core capital) banks.

Non Performing Loans of Commercial Banks

	(Ratio to total loans, percentage)								
	1994	1995	1996	1997	1998	1999*	2003	2005	2007**
NPL Ratio	5.6	5.2	3.9	5.8	7.4	6.2	2.2	1.0	0.67

*Note: * Ratio is for September, ** for end June While figures from end-1996 include the Housing and Commercial Banks from end -1997 include the long-term credit bank and not the five closed banks.
Non-performing Loans(NPL)= Substandard + Estimated Loss+ doubtful.*

Source: Financial Supervision Information, Vol. 99 no. 4, Financial Supervisory Service, March 1999. Financial Stability Report, Bank of Korea 2007

6) Government Venture Capital Funds

Korea after the financial crisis of 1997-98 made an effort to reduce the influence of the chaebol by augmenting the role of technology oriented small firms. The government jump-started the venture capital market in 1998 through direct infusion of equity capital. Certain small firms were designated “venture businesses” which are eligible for investments from venture capital firms (VCFs) and limited partnerships funds (LPFs), both are funded largely by the government and the chaebols.

Korea now ranks among the leading OECD countries in venture capital investment as a share of GDP and third in the share of venture capital being channelled to start-up enterprises (after the United States and Canada)

- 1) Limited partnership funds (LPFs)
- 2) The Informatization Promotion Fund (IPF)
- 3) The Cultural Industry Promotion Fund (CIPF)
- 4) The Film Promotion Fund (FPF)
- 5) The Science and Technology Fund (STF)
- 6) The Small and Medium Business Fund (SMBF)

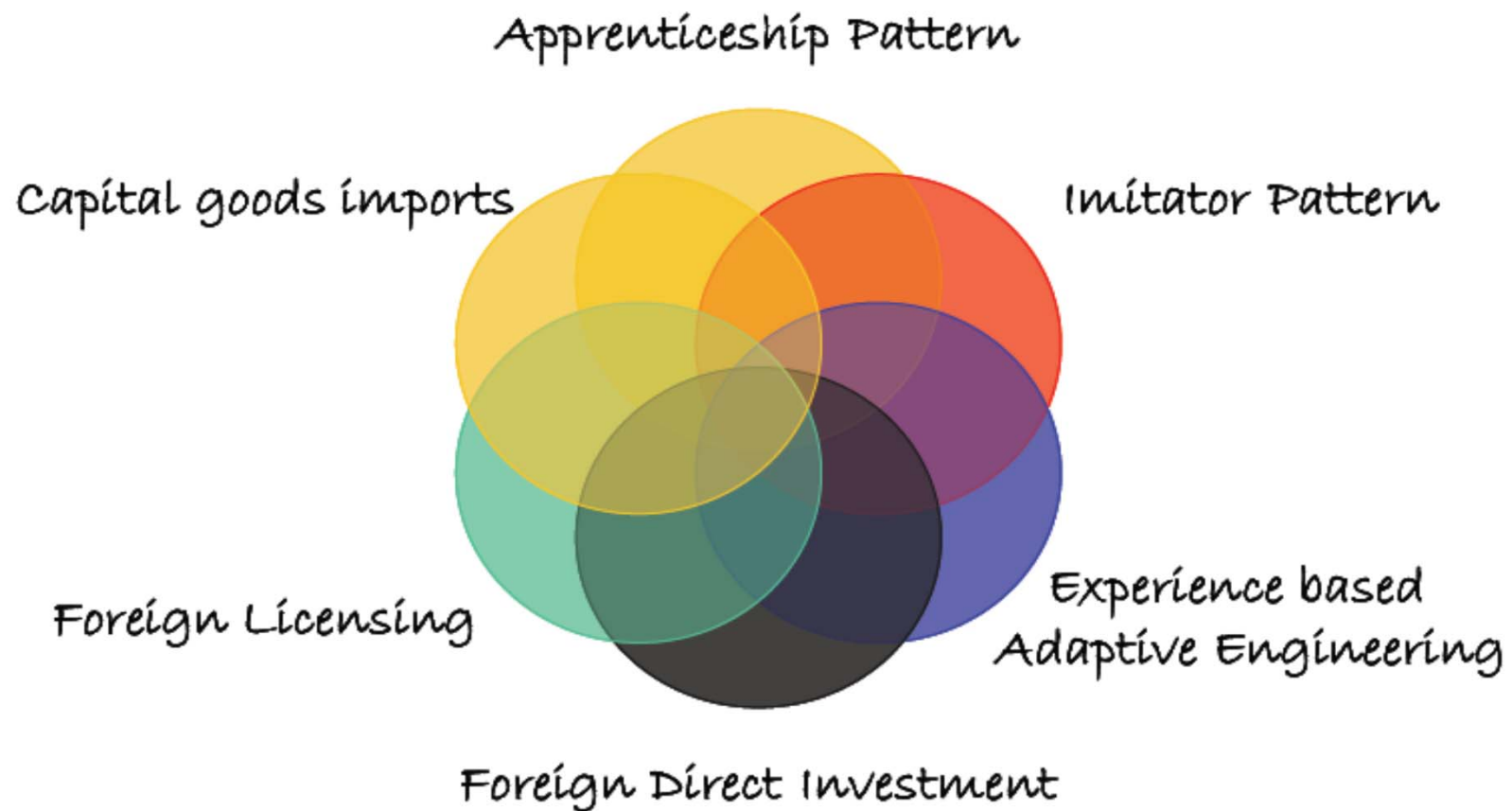
7) KOSDAQ; Second-tier stock markets

In 1996, the Korean government established the Korea Securities Dealers Automated Quotation (KOSDAQ) stock market to promote access of high-technology start-ups to equity funding, naming it after the NASDAQ in the United States. Listing on the Korean Stock Exchange (KSE) was available only to well-established companies. The KOSDAQ has easier entry requirements and lighter continuing obligations compared with the KSE. Standard requirements for paid-in capital, level of assets, business performance and debt-to-equity ratio are not applied to venture businesses. In 2002, the government revised the Special Measures Law for Fostering Venture Businesses to enhance exit procedures for venture-backed firms

Due to growth in 1998-2000 linked to the worldwide technology boom, the number of listed companies on the KOSDAQ more than doubled from 359 to 721, of which nearly half were venture businesses accounting for more than 70% of daily trading (by market value) As per 19 February 2008, 1029 companies are listed on KOSDAQ for trading. The number of listed companies in Korea is far less than on the NASDAQ but higher than in many European countries including the United Kingdom.

An Imitator to innovator; Transformation of Korea into Knowledge Economy

The Acquisition of Technological Capability through formal & Informal Modes



Government and R&D Investment in Korea

Korean firms predominantly *Chaebols*, have transformed themselves from mere imitators of mature technologies to competitor in some of cutting edge technologies just in three decades.

Expenditure on R&D Activities in Korea

(unit: billion won, %)

Year	Govt. Expenditure (A)	Total Expenditure (B)	A/B %
1980	180	283	63.7
1985	306	1,237	24.8
1990	651	3,350	19.4
1995	1,781	9,441	18.9
2000	3,452	13,849	24.9
2003	5,268	19,069	27.6
2005	5,645	23,148	24.4

Sources: Korea Ministry of Science and Technology, Science and Technology Statistics Database 2005. and "Explore Korea Through Statistics 2007" by Korean National Statistics Office, Korea

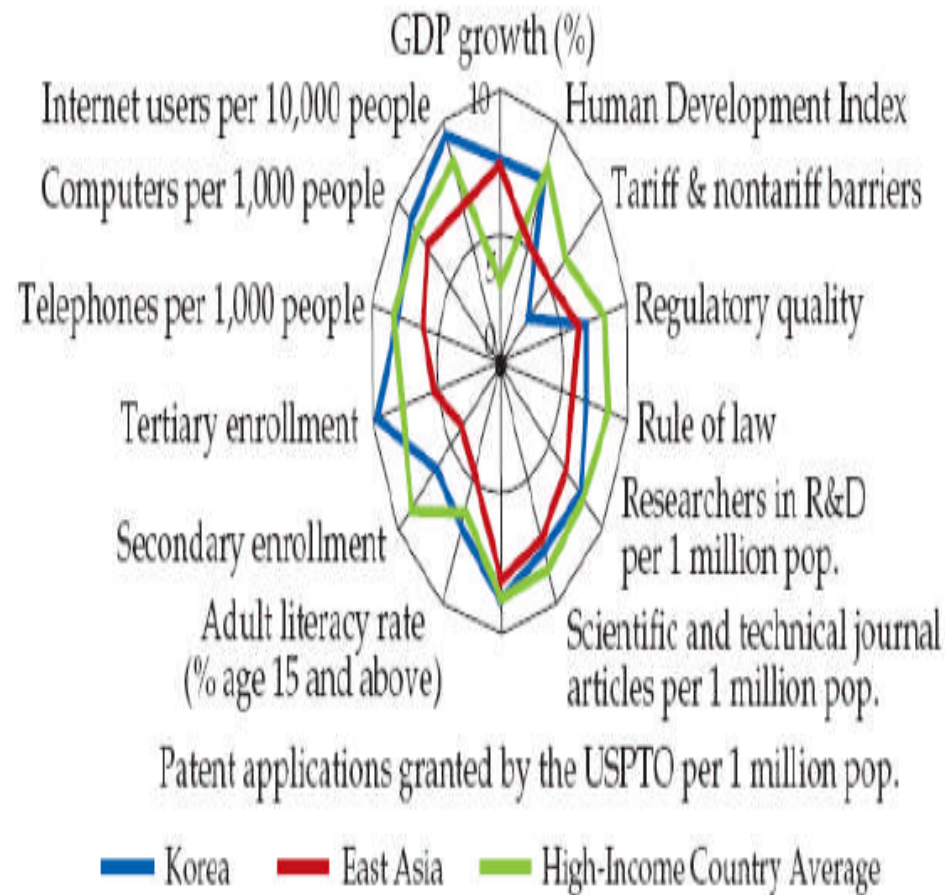
(Units: Billion Won.)

	1965	1970	1975	1980	1985	1990	1995	2000	2005
R&D expenditure	2.1	10.5	42.7	282.5	1,237.1	3,349.9	9,440.6	13,849	241,55
Universities	--	0.4	2.2	25.9	118.8	244.3	770.9	1,562	--
GRI's	--	8.9	28.1	104.5	367.2	731.0	1,766.7	2,032	--
Private Sector	0.2	1.3	12.3	81.4	751.0	2,374.5	6,903.0	10,387	183,578
Public R&D vs. Private	61:39	97:03	71:29	64:36	25:75	19:81	19:81	25:75	24:75
R&D/GNP	0.26	0.38	0.42	0.77	1.58	1.95	2.69	2.39	2.99
No. of researchers (total)*	2,135	5,628	10,275	18,434	41,473	70,503	128,315	159,973	234,709
Universities	352	2,011	4,534	8,695	14,935	21,332	44,683	51,727	64,895
GRI's	1,671	2,458	3,086	4,598	7,542	10,434	15,007	13,913	15,501
Private Sector	112	1,159	2,655	5,141	18,996	38,737	68,625	94,333	154,306
R&D Exp/ Researcher**	967	1,874	4,152	15,325	27,853	47,514	73,574	86,556	102,787
Researcher/10,000 Population	0.7	1.7	2.9	4.8	10.1	16.4	28.6	34.0	48.7
No. of corporate R&D Centers.	0	1***	12	54	183	966	2,270	--	--

*Note: The figures do not include research assistants, technicians, and other supporting personnel., ** Currency of expenditure Won 1000, *** For 1971

Source: Ministry of Science and Technology, South-Korea. and "Explore Korea Through Statistics 2007" by Korean National Statistics Office, Korea

KAM Basic Scorecard for Korea, East Asia & High Income Country Av.



Source: World Bank. Knowledge Assessment Methodology (KAM), March 2006.

Number of KPO Patents Granted

(Unit: Number of Registration, %)

	1981	1985	1990	1995	2000	2002
Total No. of Patents (T)	1,808	2,687	7,627	12,512	34,579	45,298
Patents by Koreans (K)	231	349	2,554	6,575	22,943	29,896
Ratio (K/T) %	12.8	13.0	33.5	52.5	65.5	66.7

Sources: Korean Intellectual Property Office.

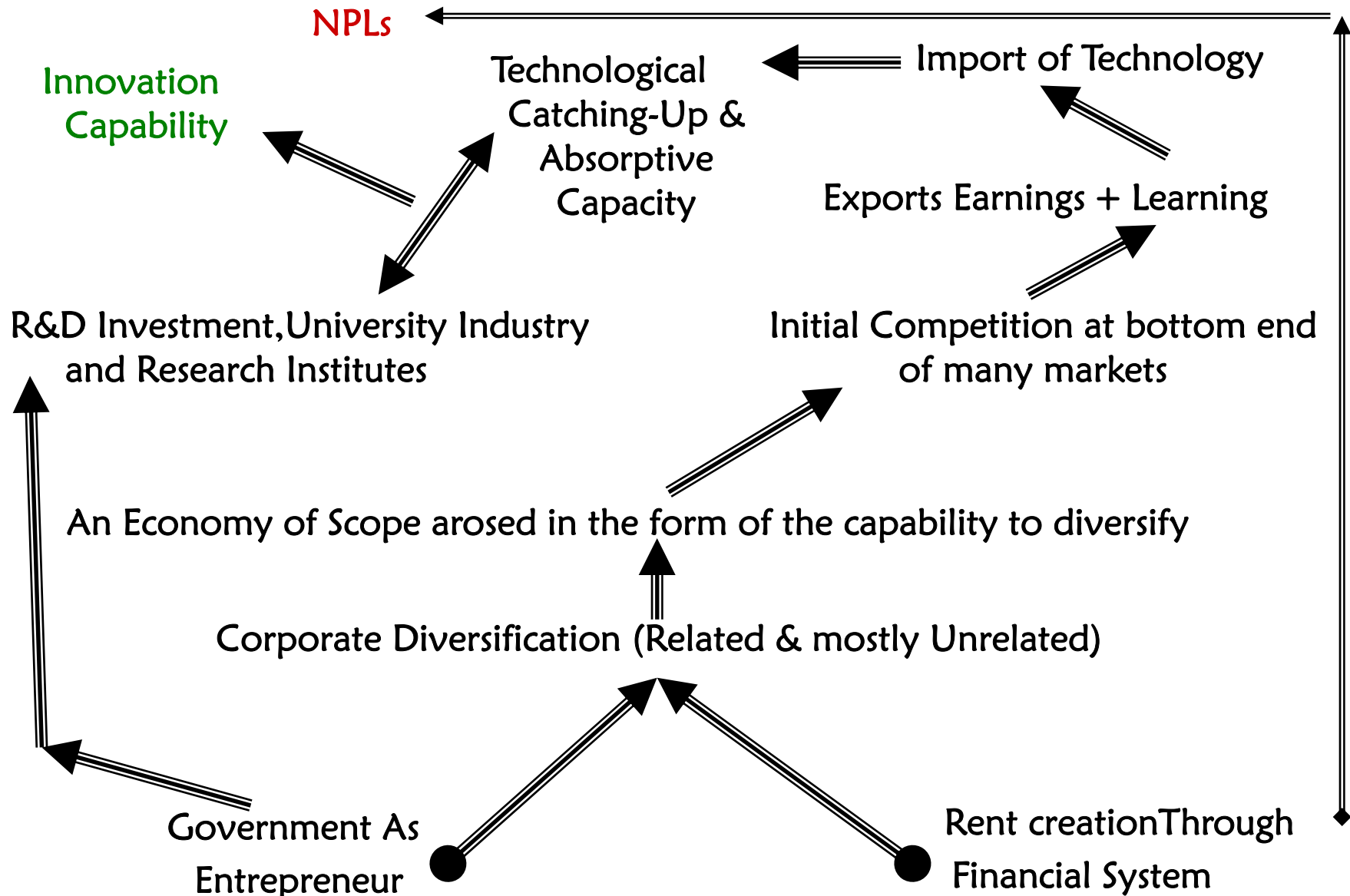
No. of US patents granted to Koreans

(Unit: Number of Registration, %)

	1994	1997	2000	2001	2002	2003
Total No. of Patents (A)	101,676	111,984	157,494	166,037	167,333	169,028
Patents by Korea (B)	943	1,891	3,314	3,538	3,786	3,944
Ratio (B/A) %	0.93	1.69	2.10	2.13	2.26	2.33
World Ranking	10	6	5	5	5	5
Technology Strength Index	9	8	8	8	8	8

Source: Korea National Statistical Office, Intellectual Property Rights Annual Report, 2004

Critical Analysis of Korean Strategy



Conclusion

Technological change, Innovation and uncertainty are inseparably connected therefore national technological development calls for soft-financial intermediation. So, it depends on the financial system that how much flexible, robust, risk mitigating and bearing it is. Greater the risk bearing appetite of a financial system, (actual or managed i.e government guarantees or easy access to finance) larger will be the numbers of entrepreneurs who will expose themselves to innovations and risks, so higher will be the corporate diversification that will give birth to the variety of products to be produced which will ensure more exports because “the utility of adding a new good to the pre-existing pattern of consumption is greater than that of adding an extra unit of a pre-existing good”.

As in this context Christensen J.L. also reiterates, “if the firm or the country were to focus all efforts on allocating existing resources in a better way, and if every single unit kept producing the same products with the same techniques, it would not only stagnate. It would gradually become increasingly poor because its products would become less and less in demand. Therefore, when the focus is on economic development , successful innovation is more important than efficient allocation.

Merci beaucoup