Upgrading the Korean Economy and Industry:
Structural Changes and Challenges in the Post-industrial, Creative Economy Age

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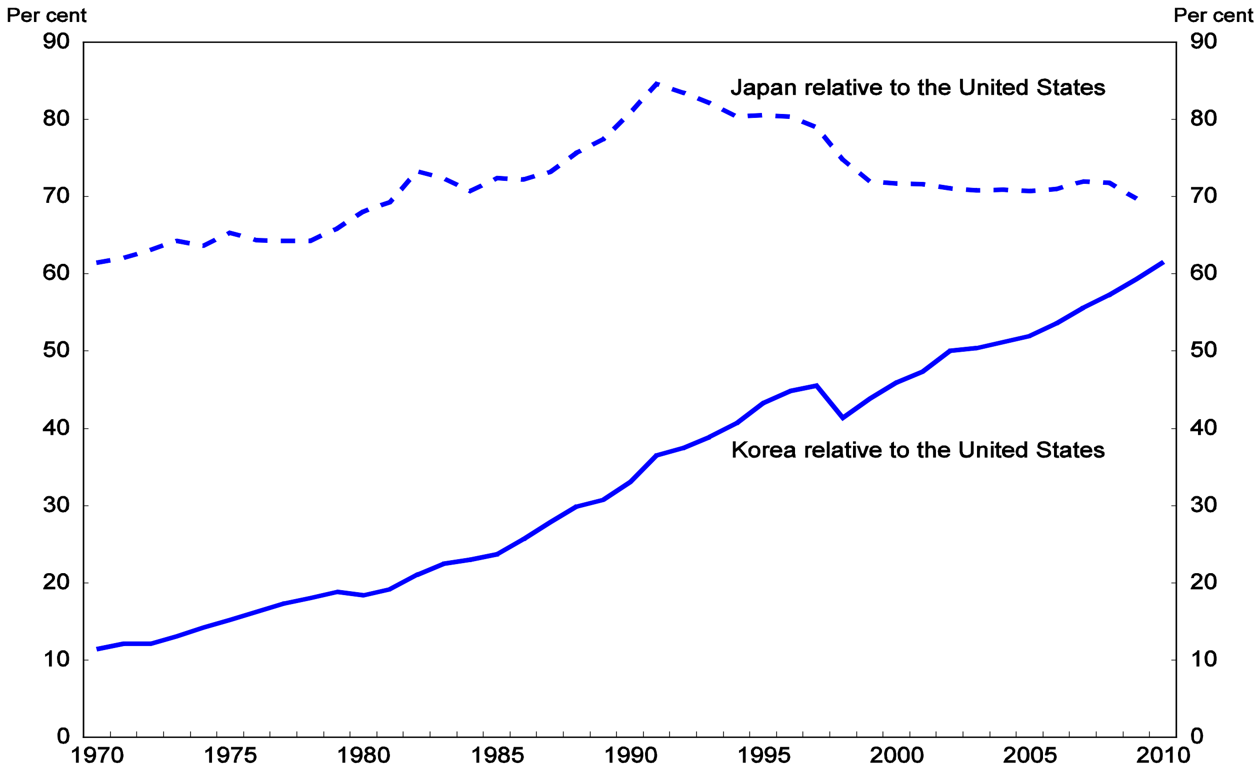
This material borrows heavily from "the Korean Economy and Industry: Structural Changes and Challenges", presentation made at International Seminar on Economic Management and Country Risks, held in Dec. 2012, Taipei, Taiwan.

Contents

I. The Korean Economy Today

>> Sanguine and Robust

- **Marked recovery from the 1997 financial crisis and sustained progress Quick recovery and resilience amid the global financial turmoil in the late 2000s**
- **Steady growth; the per capital GDP converging toward a global frontier**



1. Based on 2009 purchasing power parity exchange rates.
Source: OECD Economic Outlook database.

< Korea Now in the Global Context >

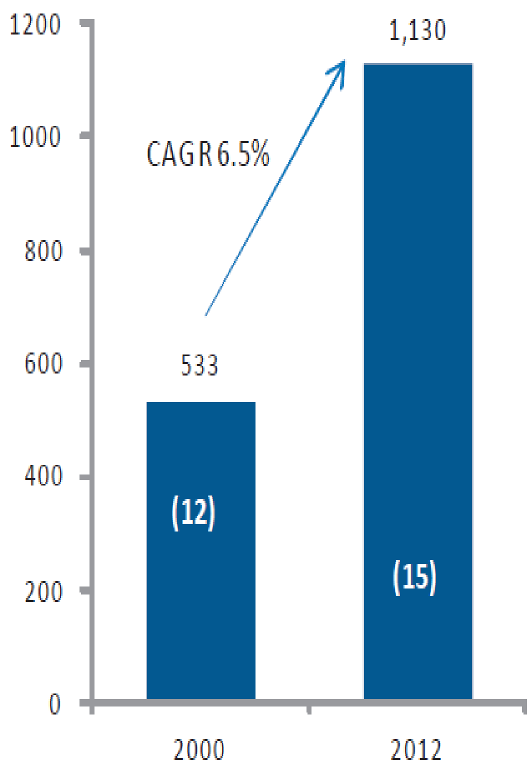
Positioned at upper tier in several core economic dimensions :
Global top 10 or better

	Index	Ranking
GDP	PPP GDP('13)	13th
	GDP per capita ('13)	30th
Trade	Exports of goods ('13) – USD 617 bil	5th
	Imports of goods and services ('13) – USD 718 bil	7th
Industry	Sales of DRAM ('14)	1st
	Production of automobiles ('13)	5th
Firms	Fortune 500('14) [1)]	7th
R&D	Total expenditure ('11)	6/61
	R&D intensity (percentage of GDP) ('11)	2/61
IT Infra	ICT Devolopment Index('14)	2/166

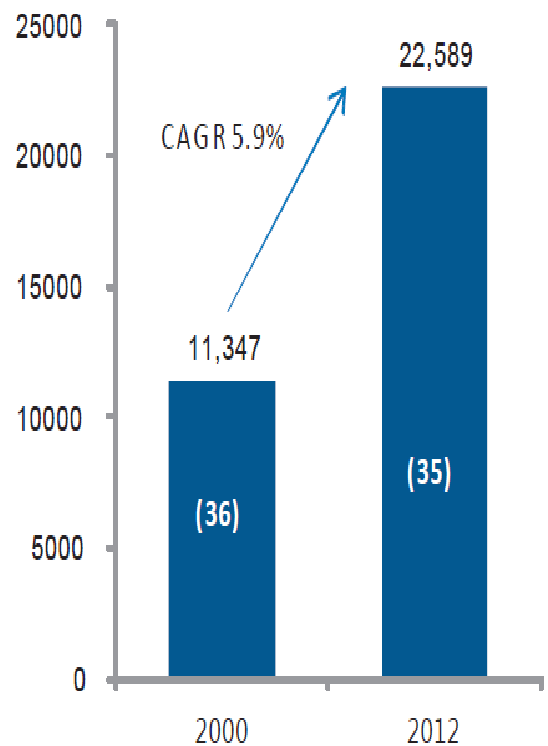
[1)] **17 Korean companies listed:** Samsung Electronics (13), SK Holdings (64), Hyundai Motor (100), POSCO (177), LG Electronics (194), Hyundai Heavy Industries (209), Korea Electric Power(212), Kia Motors (246), GS Caltex (260), Hanwha(331), Korea Gas(340), Hyundai Mobis(388), S-Oil (427), Samsung Life Insurance(458), Samsung C&T(460), Lotte Shopping(464), LG Display(482)

Quantitative Growth of Korean Economy

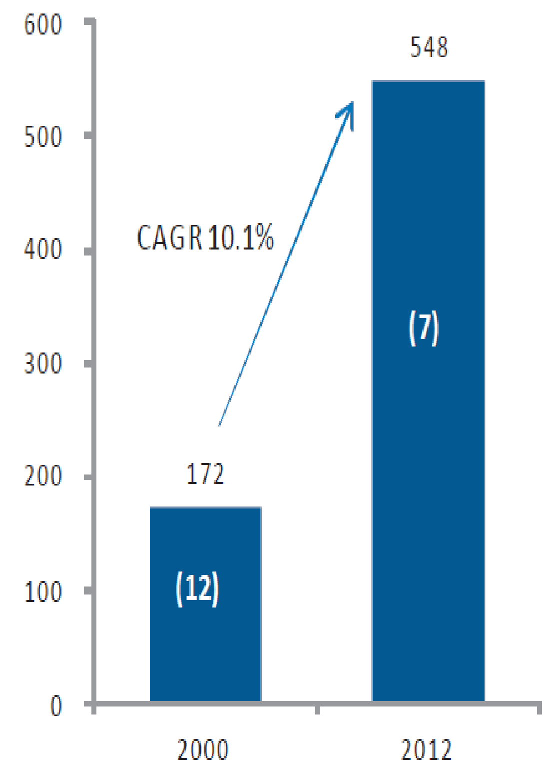
Nominal GDP



GDP per capita



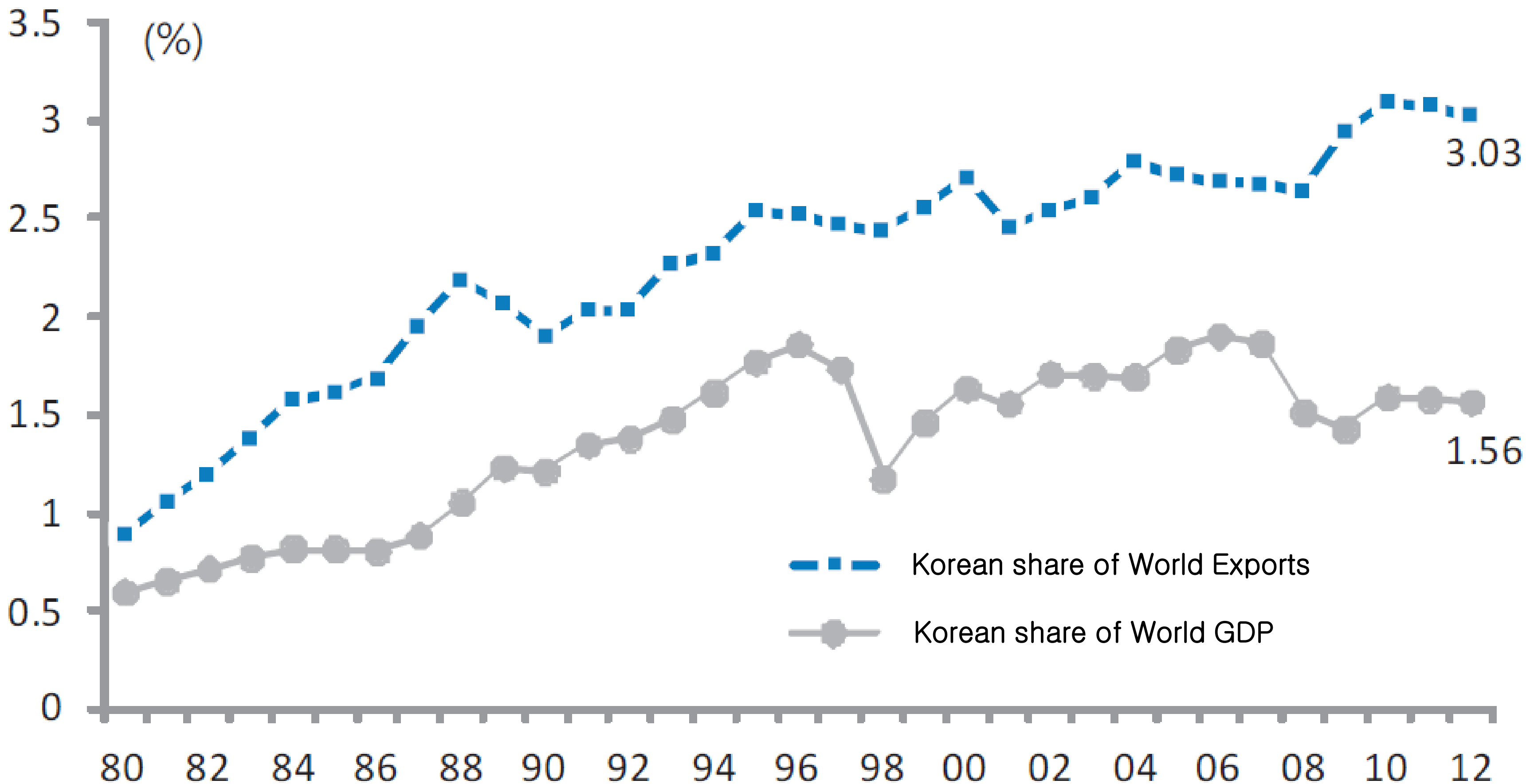
Merchandise Exports



* ( ): World Ranking
Source: IMF

KDI

Korean Share of World GDP and World Exports



Source : IMF, World Bank

KDI

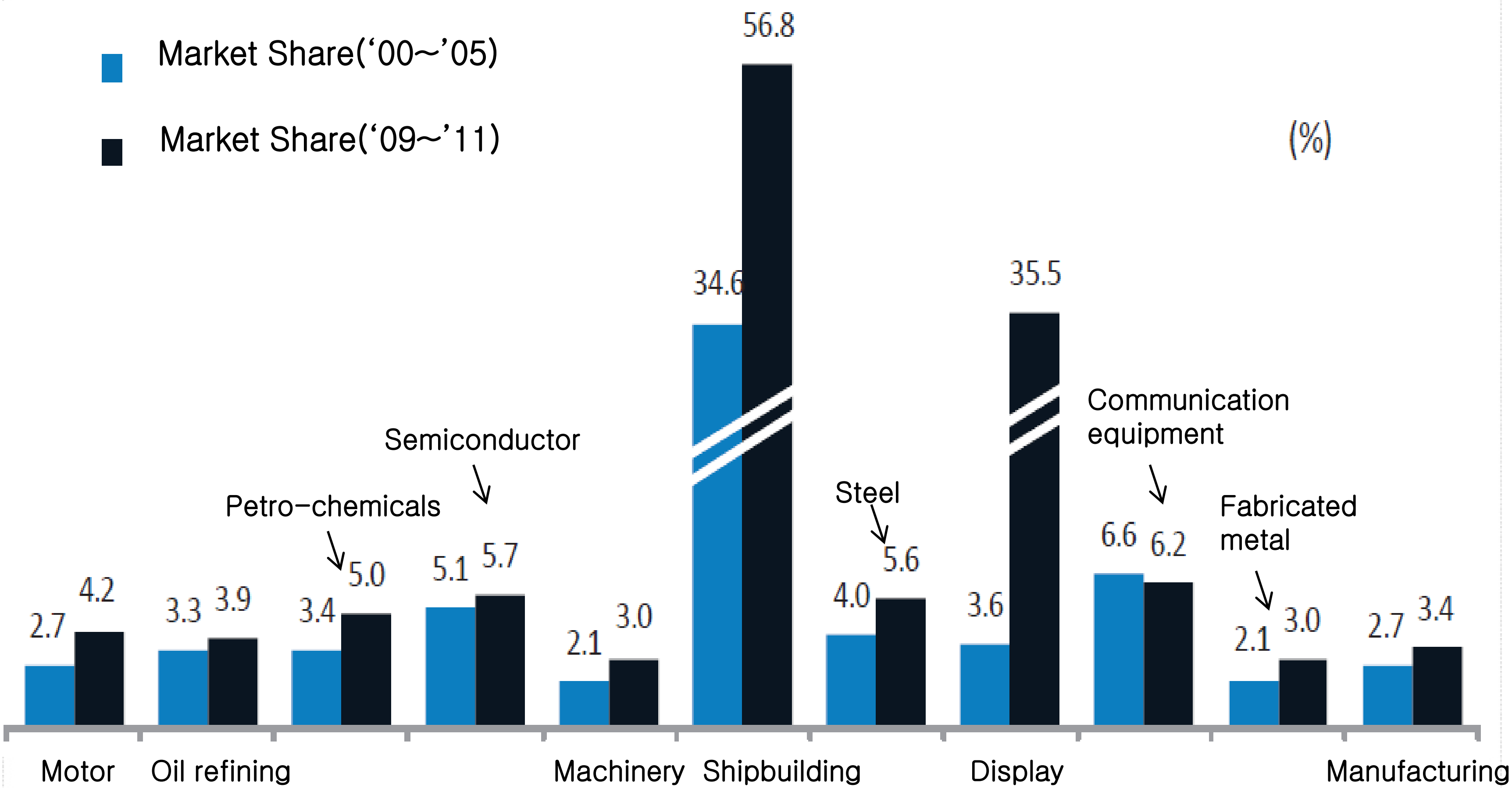
< Major Industrial Achievements >

US$ Billion

Major Industry	Global Market Share		Global Ranks		Export
Automobile	8.7%	(5.3)	5	(6)	67.5
Shipbuilding	52.5%	(43.0)	1	(1)	56.6
Semiconductor	14.3%	(7.0)	3	(3)	50.14
Digital Home Appliance	9.0%	(9.0)	5		13.8
Display (TV)	45.6%	(22.0)	1	(1)	29.95
Machinery	3.0%	(2.3)	9	(15)	36.22
Steel	5.1%	(5.2)	6	(6)	28.89
Petrochemical	5.2%	(4.2)	5	(10)	35.7
Textile	2.1%	(4.7)	8	(5)	13.92

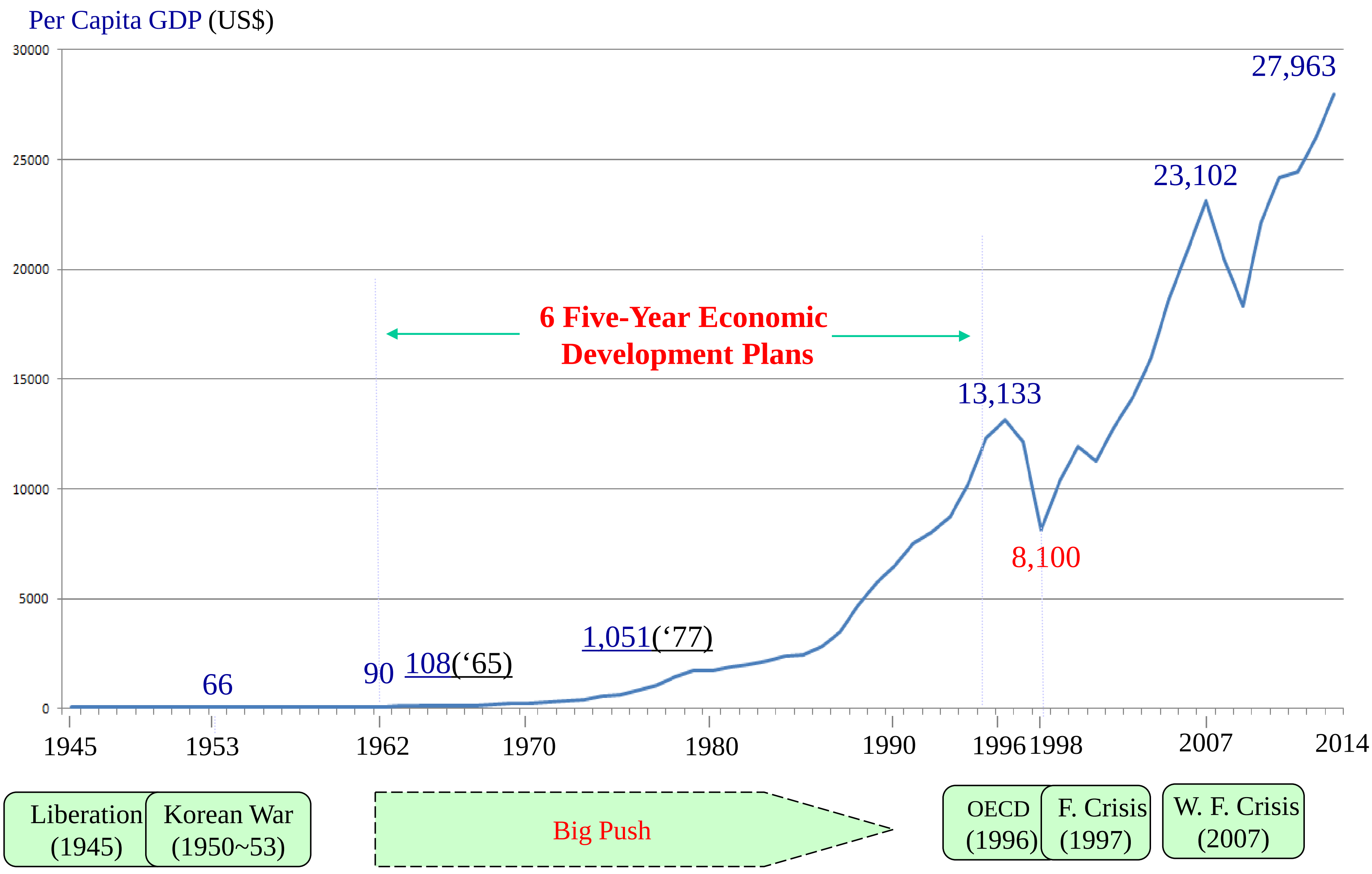
Source : MKE, 2010
Number in ( ) : MIKE 2004

World Market Share of Korea’ s 10 Mainstay Industries

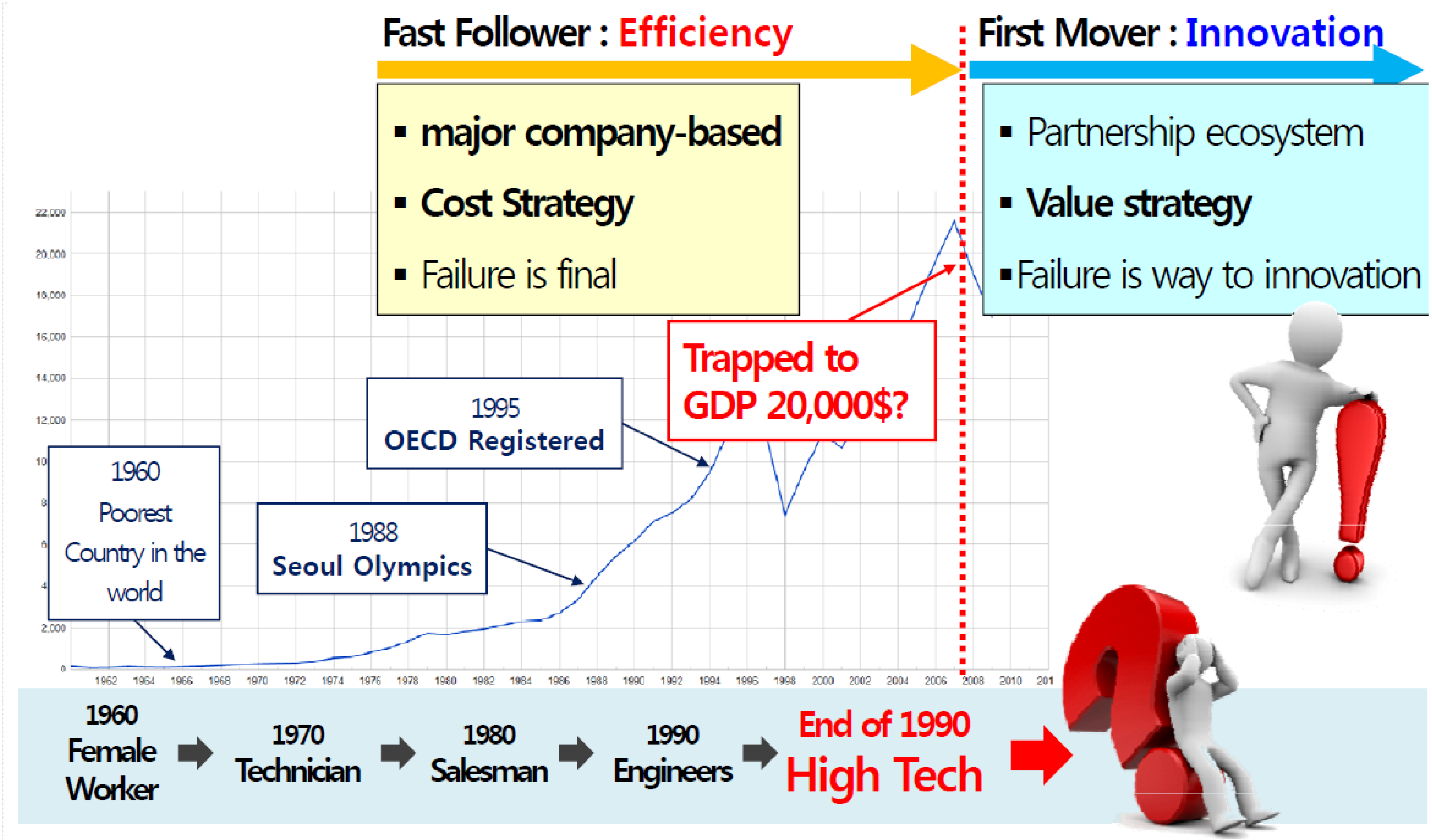


Source : Woori Finance Research Institute, Korea

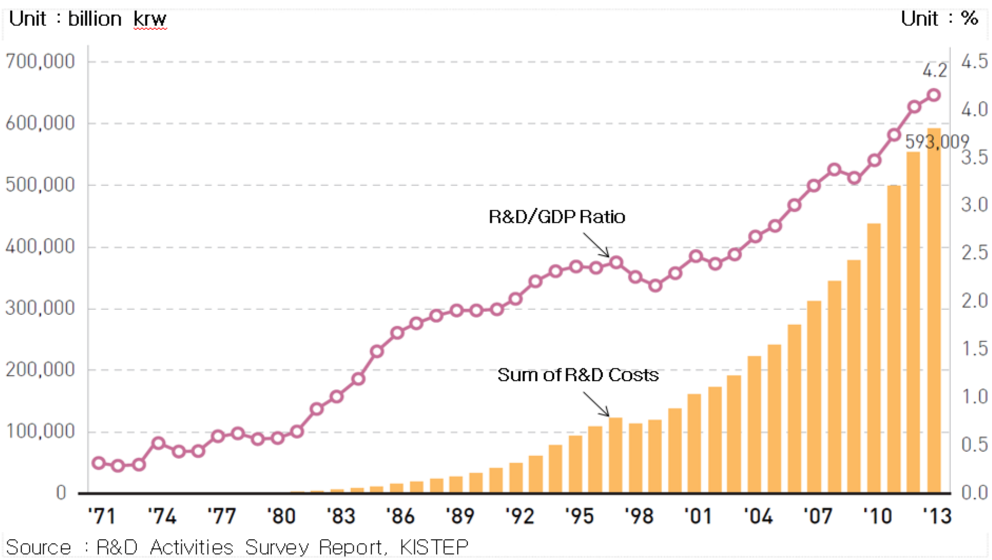
< Transformation of the Korean Economy >

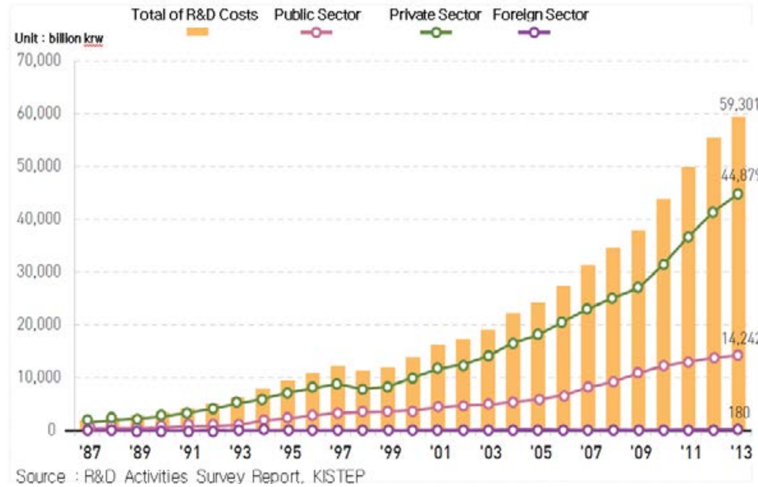


Advent of Creative Economy



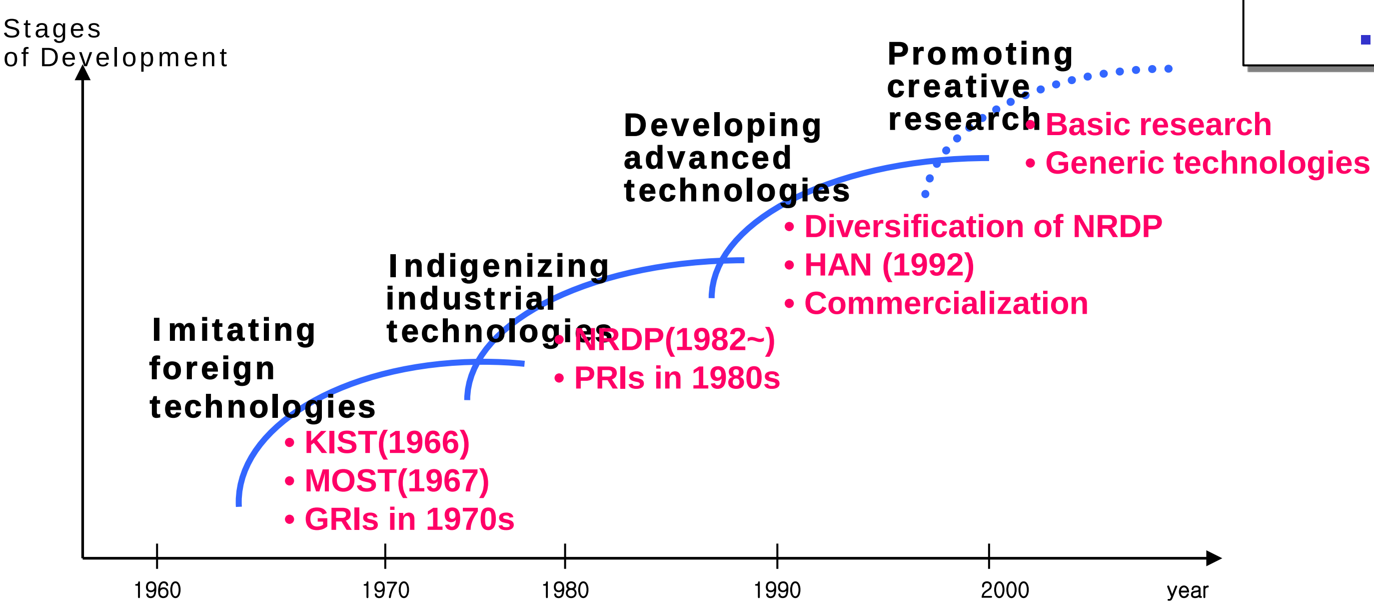
>> From Imitation => Innovation => Creation





➢ R&D continues to rise fast

- 4.2 % of GDP (join global leaders)
- private-sector dominated (~80%)
- more into science-oriented, creative



>> But strained heavily - as perceived so inside

- **Still undergoing "deep & fast" structural changes/ adjustment, strained in the face of a set of overarching challenges**

Internal Strain

- **Stagnant and unstable economy**
  Losing growth momentum (2-3% yr)
- **Weakening industrial competitiveness**
- **Widening disparity & Job insecurity**
- **Rapid aging (+ Low fertility)**

External Pressure

- **Globalization**
- **S&T revolution (IT, NT, BT etc)**
- **BRICs, other Industrializing Nations**
- **(+ DDA, FTA)**

- **Fundamental changes under way**
  - **Industrial structure and leading players**
  - **Market and policy environments**
    - * **innovation oriented, more market-driven**
  - **Firm behavior/strategy and exterior interaction**
  - **Polarization across/ within industries and firms**
    * **mature industrialized -> K-, Creativity -based**

>> Competitiveness Concern in Korea – Context

- Ten-years of serious pubic attention and debate in Korea, since the 1997-98 financial crisis
  - Awakened to the limitations of the “old Korean development model” and industrial/national competitiveness
- **Comprehensive reforms** and a set of **new policy initiatives** to enhance competitiveness and move toward a KBE
  - Macro Reforms: Financial, Corporate, Labor, Public Sectors
  - Micro Sectors: Education, R&D and Innovation, Trade-FDI, Welfare
  - The outcome? Views split widely, esp. inside Korea, e.g.
    - “stagnant or even retrogressive (Lost decade” polemics)” vs.
    - “some progress, but not enough” vs.
    - “substantial progress to the point of societal transformation”.
- Toward late 2000s, a sign of structural stagnation, with many leading firms struggling, while a new generation of creative firms yet to take hold.
  - What is the prospect of Korea’s future? What needs to be done?

>> Overarching Concern (i)

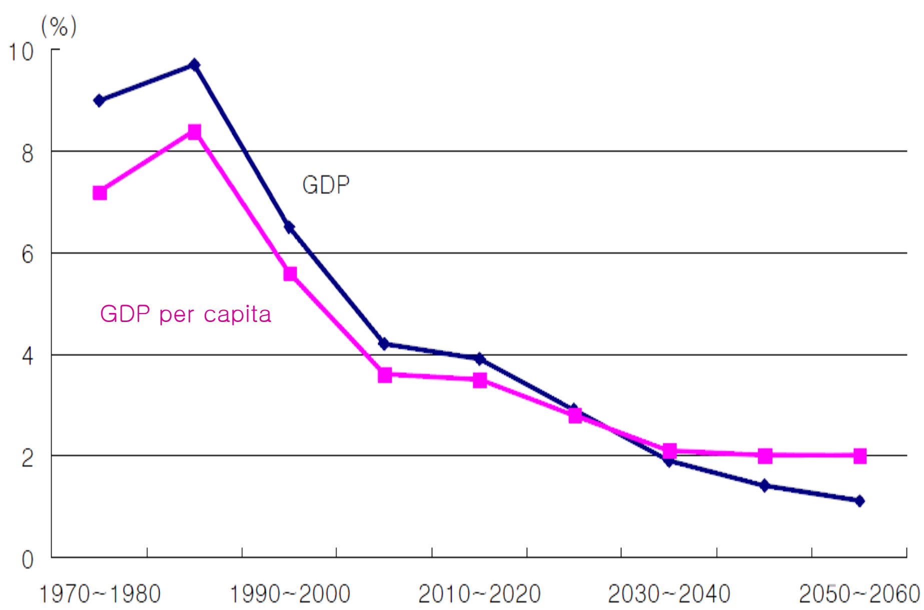
<Sagging and unstable economy>

- **Growth performance:**
  - **more precarious since the 1997 crisis**
  - **third business cycles under way now**

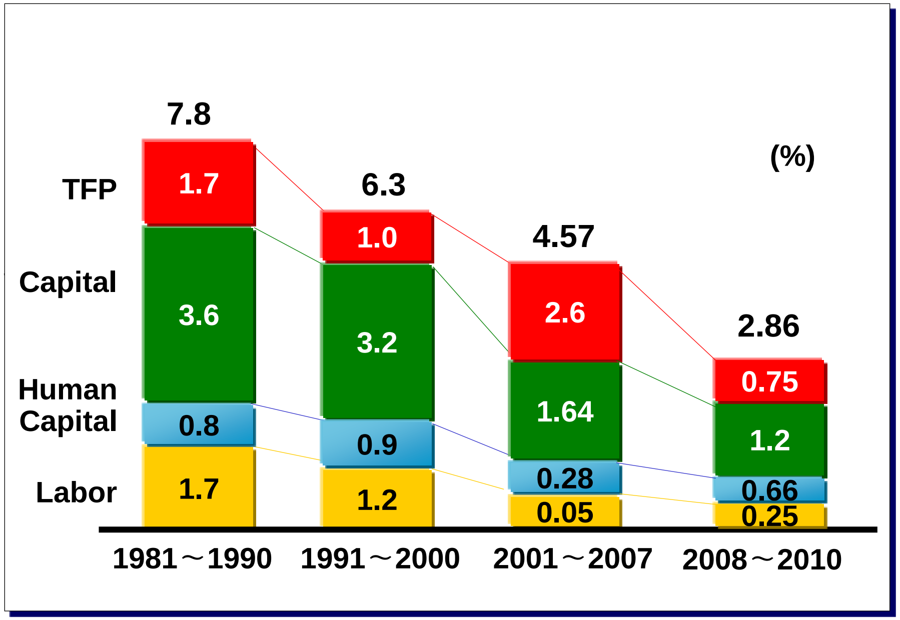
<Losing growth momentum>

- **Long-term potential growth rate:**
  - **forecast to fall esp. due to falling labor input (aging problem)**

Growth Rate (1961-2011) & Potential Growth (2012-2060)



Growth Components (1981-2010)



Source: KDI (2012), The Korean Economy: its medium-long term challenges and the direction of fiscal policy

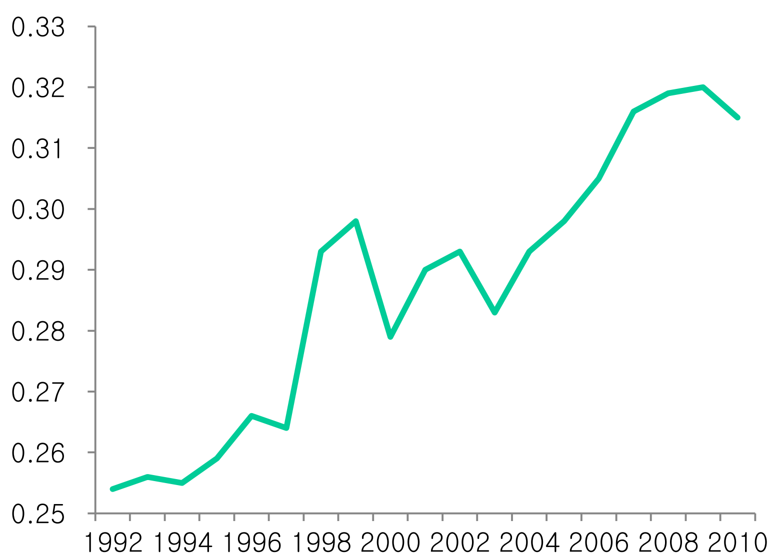
>> Overarching Concern (ii)

< Rising Income Disparity and Poverty>

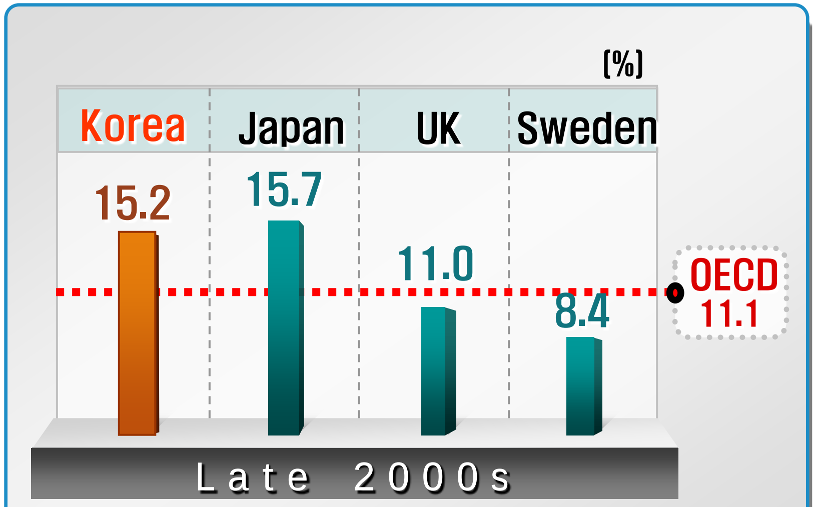
➢ Mounting concern over greater **income disparity**

* **Income gap increased among urban wage earners (2/3 of total workforce) +**
* **among the whole workforce including self-employers and unpaid workers (1/3)**
=> New "Working Poor" groups: SMEs labor, self-employers, and temps

Gini-Coefficients (1992~2010)



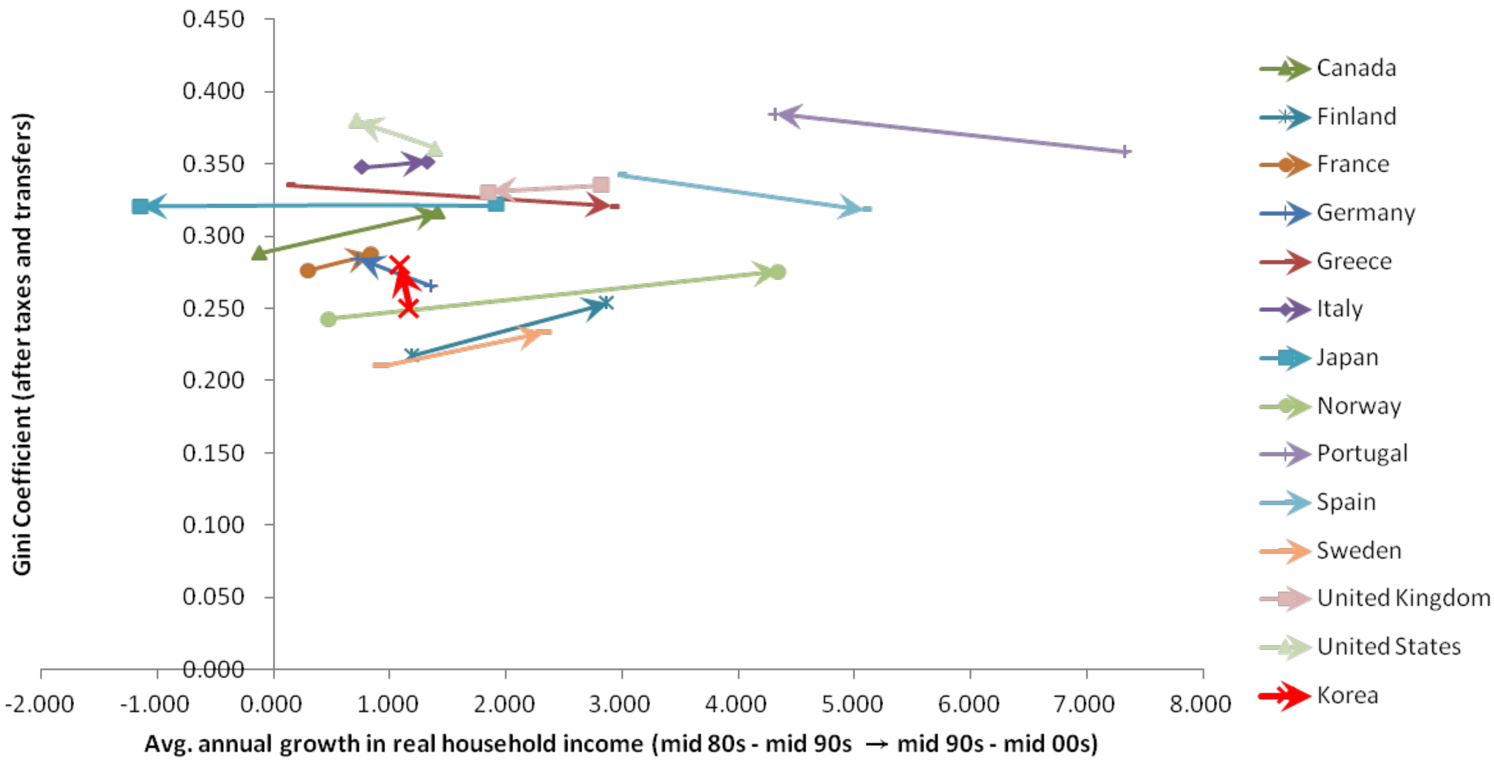
Poverty Rate (after taxes & transfers)



* share of households with 50% of median income

>> To sum-up: Increasing Disparity amid Lower Growth

- **Manifested since the 90s (esp. since around the mid-1990s)**
- **Phase shift from the old Korean model of "equitable, high growth" to "inequitable, low growth"**
- **Korea shows steep increase in gini coefficient and slight deterioration in income growth (see below graph)**



*** The arrows in the graph represent the change of [Avg. annual growth in real household income] from "mid 1980s – mid 1990s" to "mid 1990s - mid 2000s"**

II. Structural Changes and Challenges
– Overall Picture

>> Industrial and Business Landscape

< Deep and wide structural changes under way >

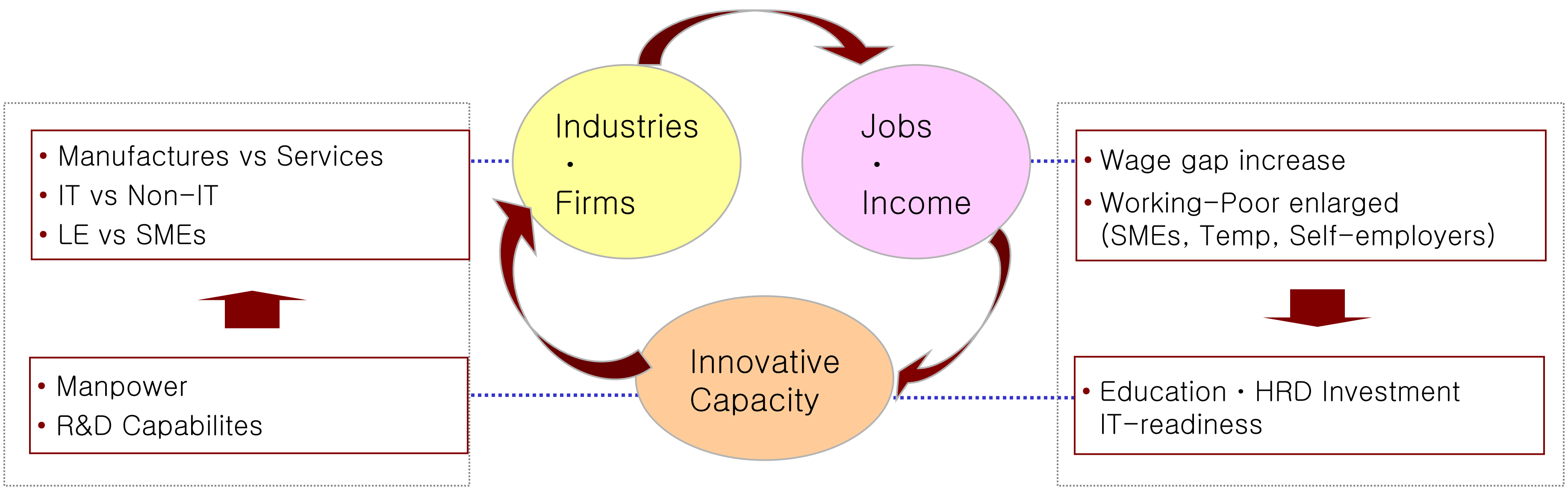
Change in Industrial organization	• Dominance of Korean conglomerates (Chaebols) → Tripod structure * Chaebols + foreign MNEs + new tech-based SMEs (NTBFs) • Subcontract relation btw large companies and SMEs changing
Upgrading of Firms Activities	• Focus shifting: Production -> R&D, marketing, etc. → business streamlining, spin-offs, labor shedding by LEs • Buidling Innovation networks (national/regional; maturing) → Triple helix among Firms, Univ. and Research Institutes, Gov.
Polarization	• a few Korean firms (Samsung, Hyundai, LG) soared as global leaders → laying the foundation for a dynamic, and innovation-based growth • but, most SMEs stagnant/losing ground in general product areas. - Same with large conglomerate-type firms in traditional business * Service sector absorbing more labor, but still backward relative to mfr.

>> Threat of a Vicious Circle – Polarization

■ **Drastic changes in economic environment (esp. since the crisis)**
=> Rapid progress of Polarization (Divide)

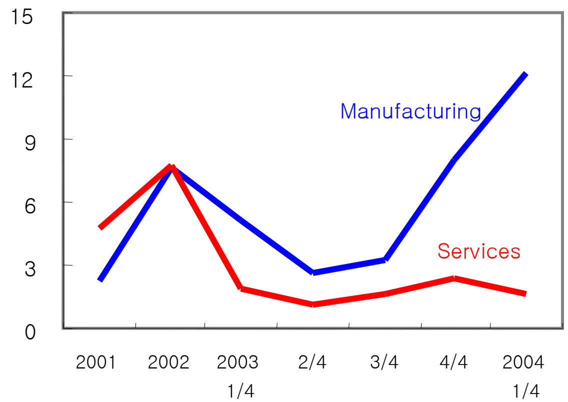
- **Developed steadily during 90s + amplified during the recent recession**
- **Self-sustaining forces in effect now (arguably)**

Circular Structure of Polarization

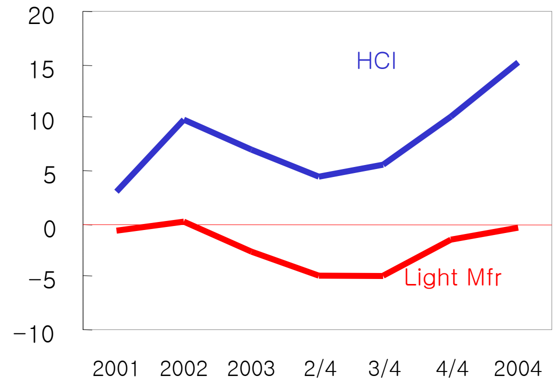


[Cutting Dimensions of Polarization]

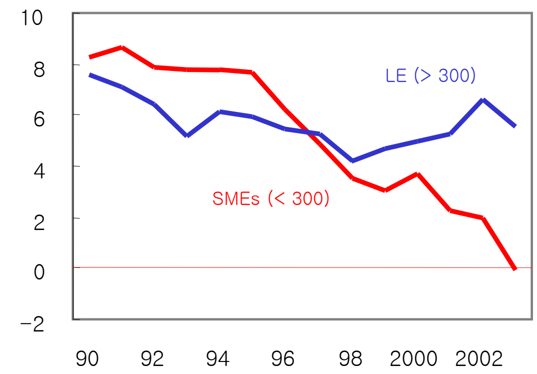
Growth Gap: Sectors



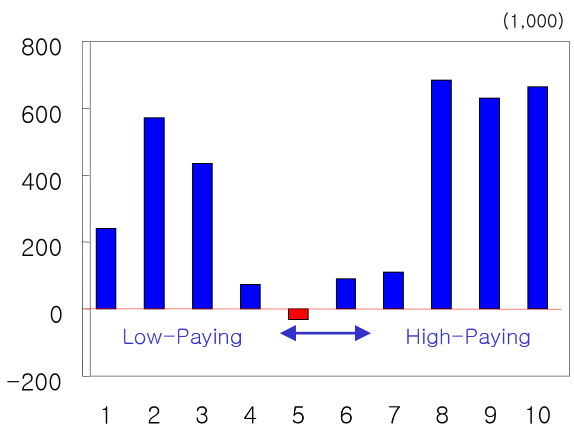
Growth Gap: Industries



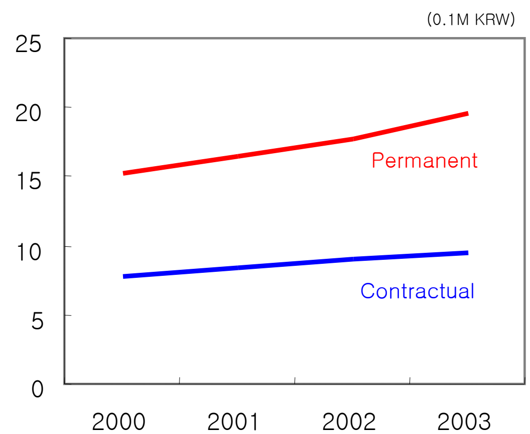
Earnings by firm size (KOSPI)



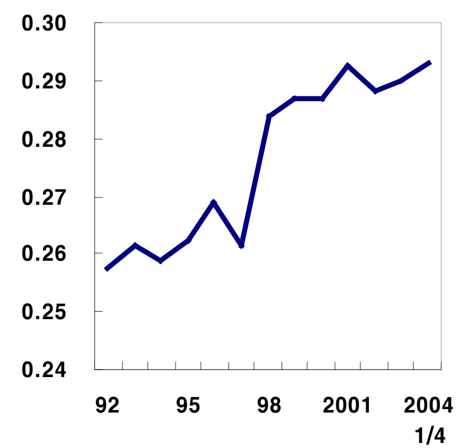
New Jobs ('93~2002)



Wage Gap



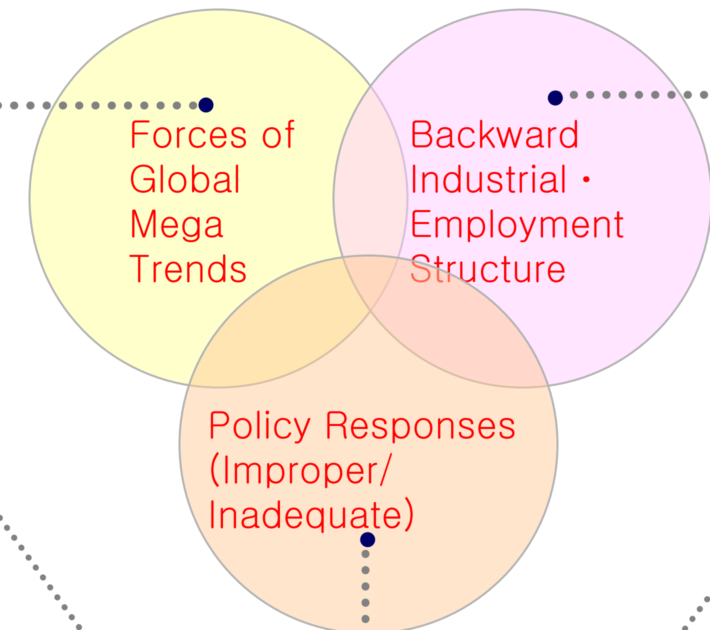
Gini (Wages)



Sources/Causes of Polarization

Global Trends + Industrial Structure + Policy Factors

- Globalization
- Rise of China
- ICT etc.



- Weak SMEs (esp. Parts, Materials)
- Over-extended Self-Employers Sector

- Backlogged Reform → Unleashed disruptively after the Crisis
- Imprudent Promotion of Startups / Domestic Demand
- Inadequate Social Safety Net

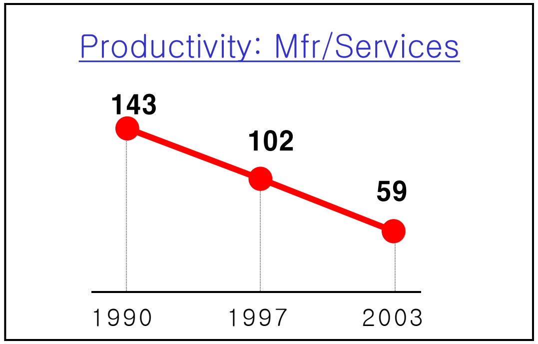
>> Stages of Polarization: Industrial & Business Dimensions

>> Phases of Progression

Sectors

Manufacturing vs. Services since 1990

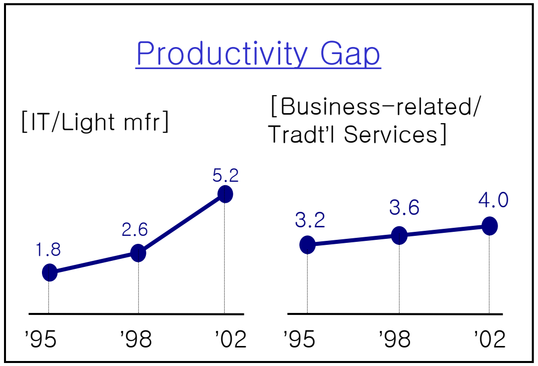
- **Productivity gap of services increased**



Industries

Leading vs. Traditional : Mfr → Services

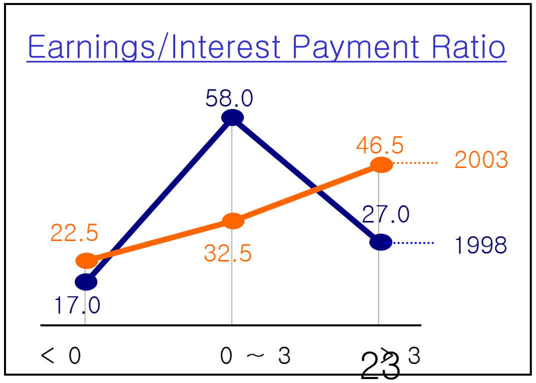
- **Mfr: HICs including IT vs. Light Mfr**
- **Services: Business-related vs. Traditional**



Firms

Leading vs. traditional at all industries

- **Pronounced in high-growth, dynamic industries -> extended into all industries including traditional services**
  - **Hollowing-out of mid-performers**



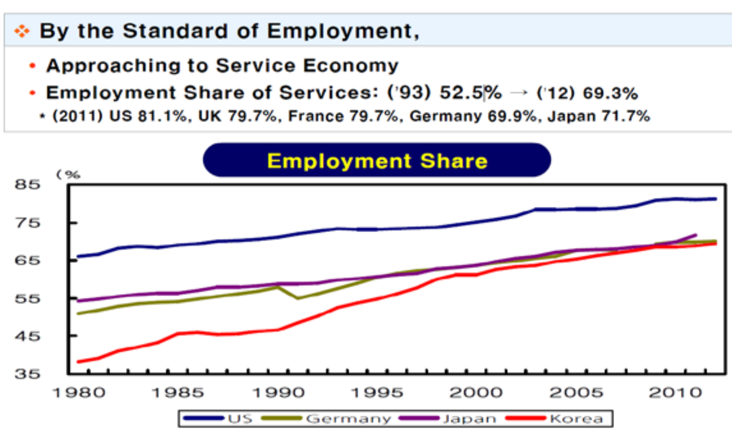
>> Manufacturing vs. Services : De-industrialization

"Job quality & income disparity" problems largely reflect Korea's undeveloped service sector

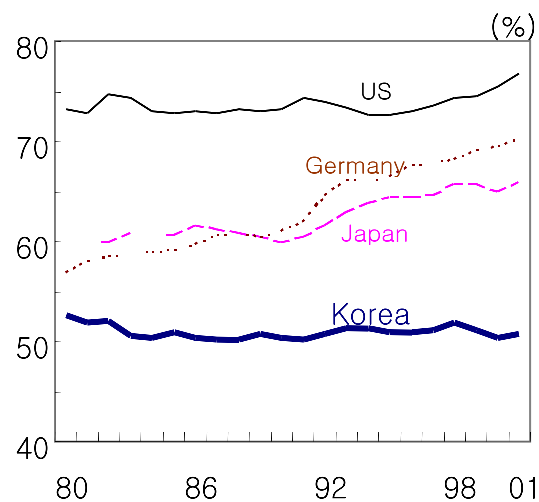
Service sector has expanded steadily in employment while Real GDP has remained stagnant at 50~52%
⇔ Low-productivity of services

Share of the Service Sector

Employment



Real GDP



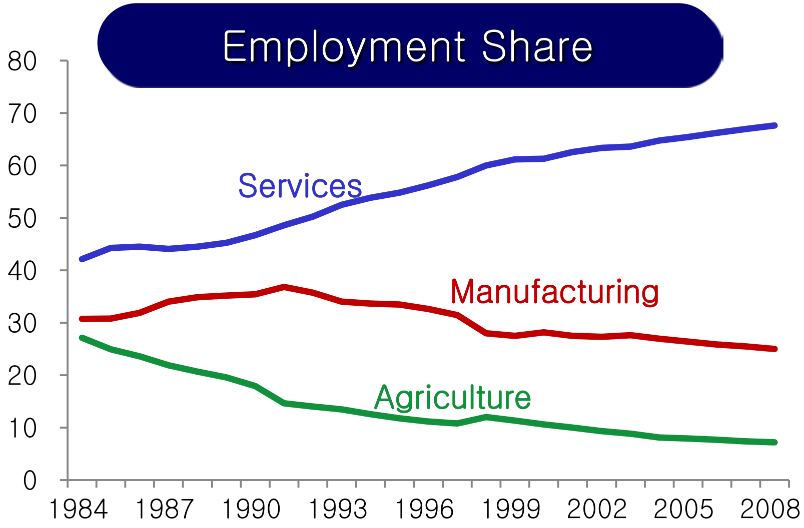
Source: OECD, STAN D/B

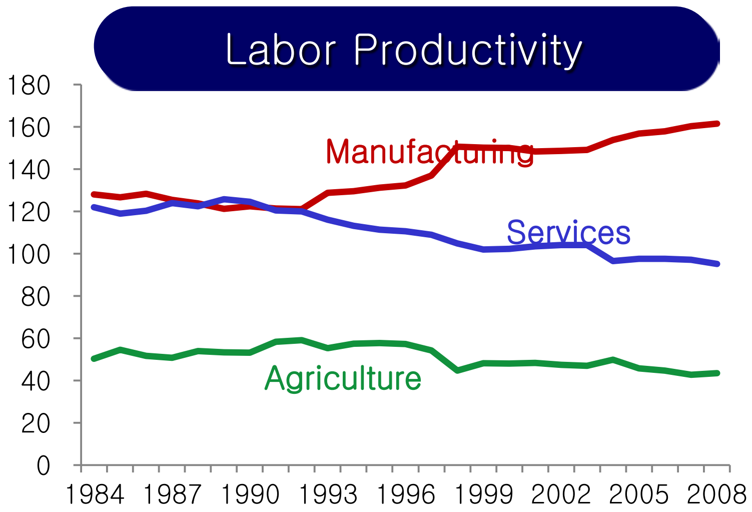
>> Productivity of the Services Sector in Korea

Widening gap against the manufacturing sector and abroad

- **Services absorbed labor released from mfr. since early 1990s, while productivity gap against mfr. increased rapidly***

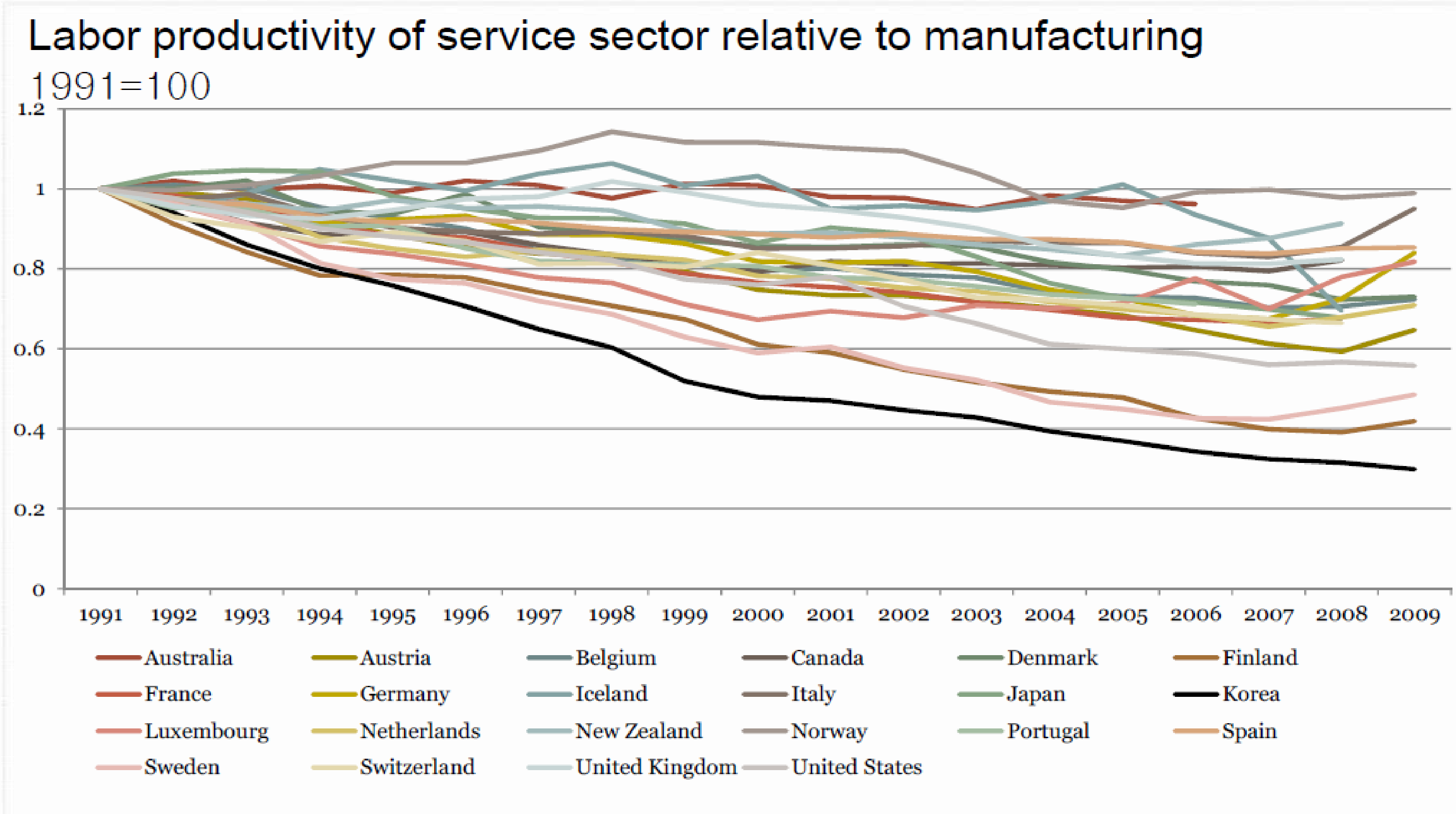
(1M KRW/day)





- **Marked productivity increase in the Korean mfr after the financial crisis**
  *** 4% ('85-'97) → 11.7% ('99 ~)   * led by flagship companies in electronics, auto.**

Trends in the Service Sector Productivity(1991-2009)



Source: OECD STAN Database

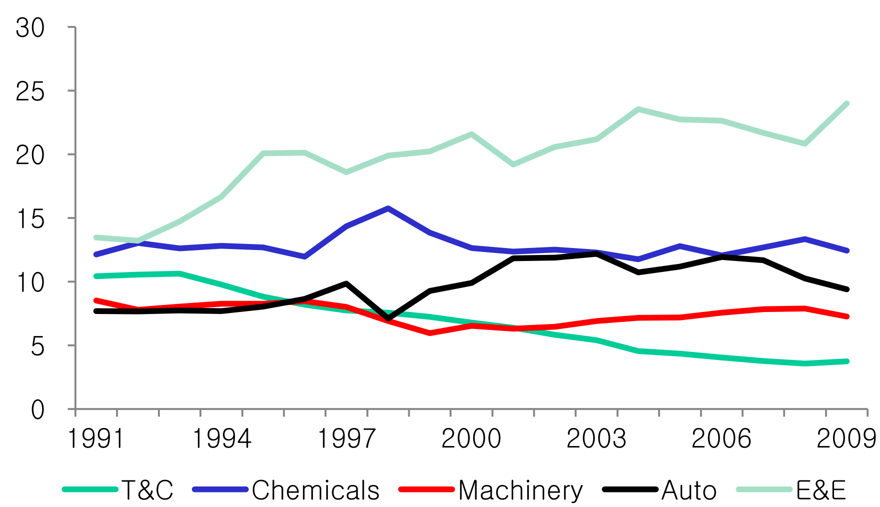
II. Manufacturing Sector in Korea

>> Sectoral Performance

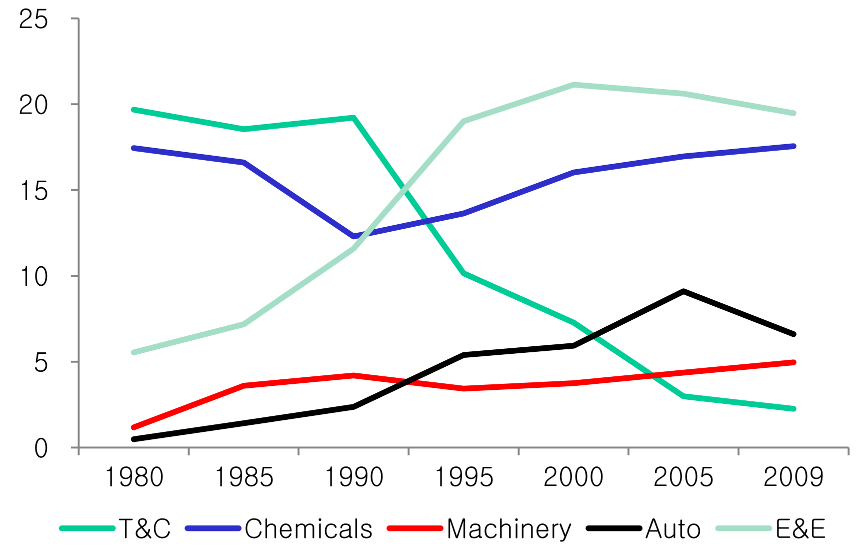
Robust growth; but notable structural changes/upgrading

- **E&E (Electronics and electricals) : high growth trend both in VA and export**
- **Auto: steady gain especially in exports**
- **Machinery: stable/stagnant (mild recovery from the 1997 crisis)**
- **T&C (textiles and clothing): Sharp trend decline; very pronounced in exports**
- **Chemicals: stable (gaining in exports)**

Value-added Shares by Sectors



Exports Shares by Sectors



>> Notable Structural Upgrading…

➢ Industrial composition: Continuous structural upgrading over time

* Light manufactures ➔□HCIs, * Low-tech ➔ High-tech etc.
* technological/innovative capabilities built up steadily esp. since 90s

➢ Trend changes set in after the financial crisis

* Venture boom and surging -up of start-ups
* Forging up of NTBFs (substantial in number)
* Stepped R&D efforts in general
* More into export market (export propensity up)
* Financially more sober (lower debt ratio)

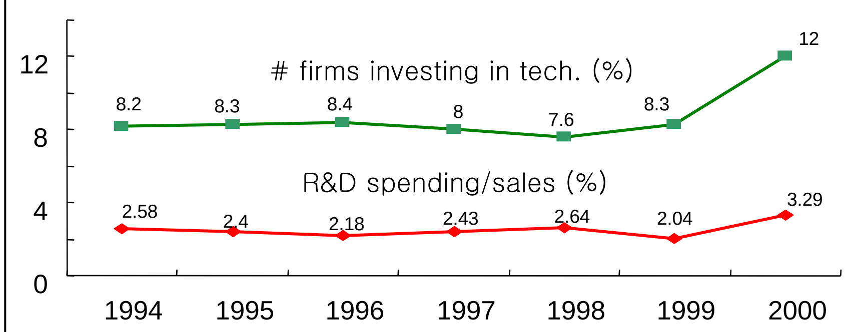
➔ Point to potentials of the Korean SMEs (hitherto suppressed dynamism)

New Trends after the Financial Crisis

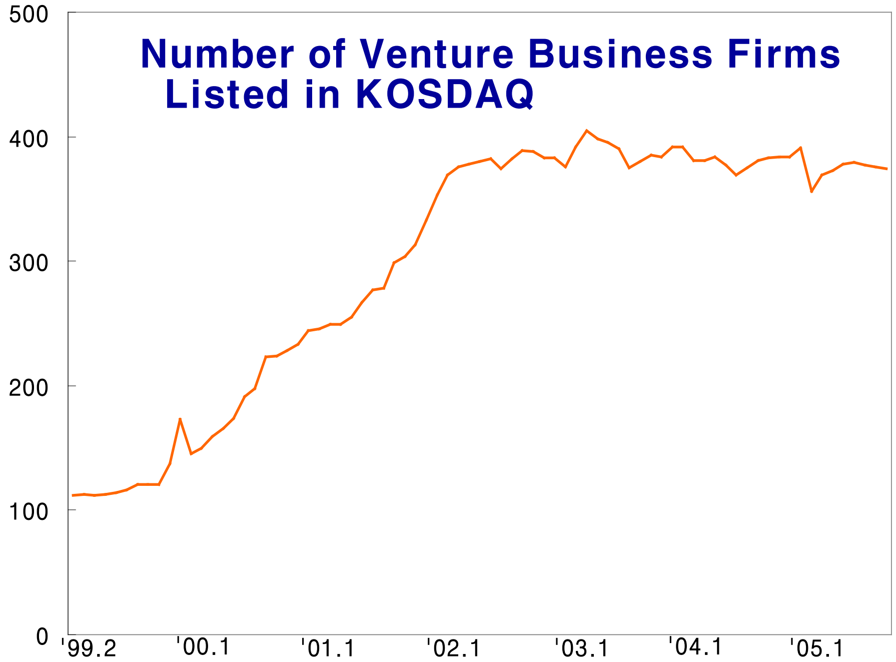
	1993	1997	2000
The Venture-Authorized		2042*	11392**
Firms with R&D Labs	1114	2278	6307
Tech. Develpoment	7.7	8.0	12.0
Exports Share (%)	-	31*	42.9**
Debt Ratio (%)	255.23	305.48	192.56
Capital-Assets Ratio (%)	28.15	24.66	34.18

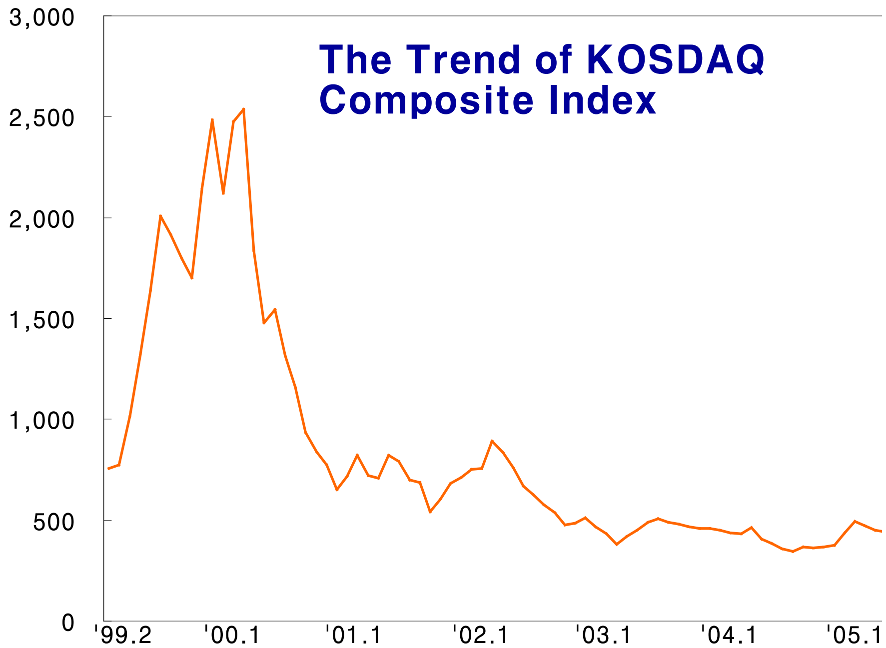
* 1998, ** 2001

Technological Capabilities



Venture Boom and Bust in Korea





>> But still struggling – SMEs Issue

➢ **For all positive changes, most Korean SMEs remain inapt and vulnerable**

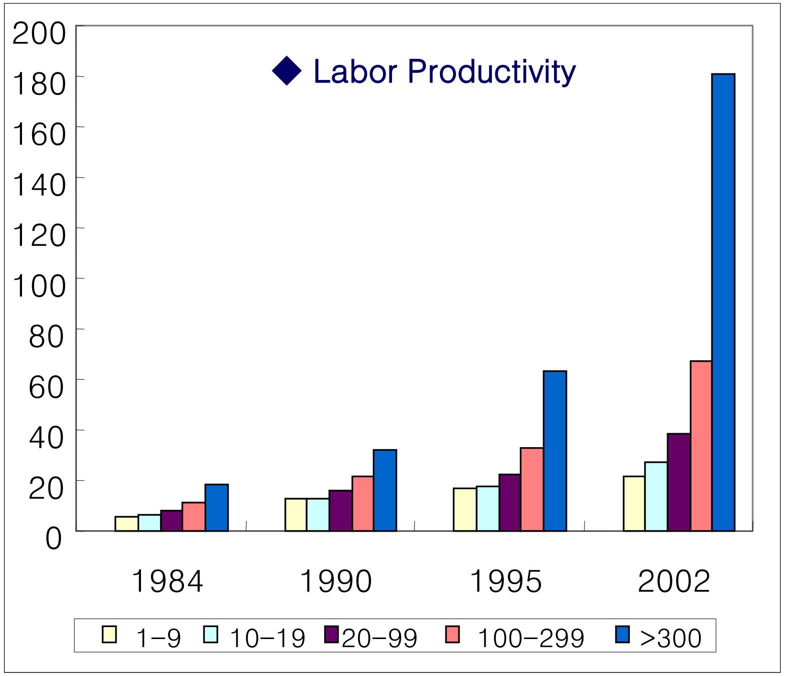
* 'Passive' or 'Reactive' in overall business orientation and capabilities
  - unable to proactively respond to rapid structural changes under way
  - accustomed to surval under government protection/support
* especially weak in technological (R&D) capabilities
  - SMEs with technological innovation capabilities: about 20%
  (higher than in the past way, but still below advanced countries (30~40%)
* also weak in other upstream & downstream activities
  - design, marketing (esp. international), brand-exploitation etc.
  * professional business services market under-developed

➢ **As a result, gaps against big leading firms widened**

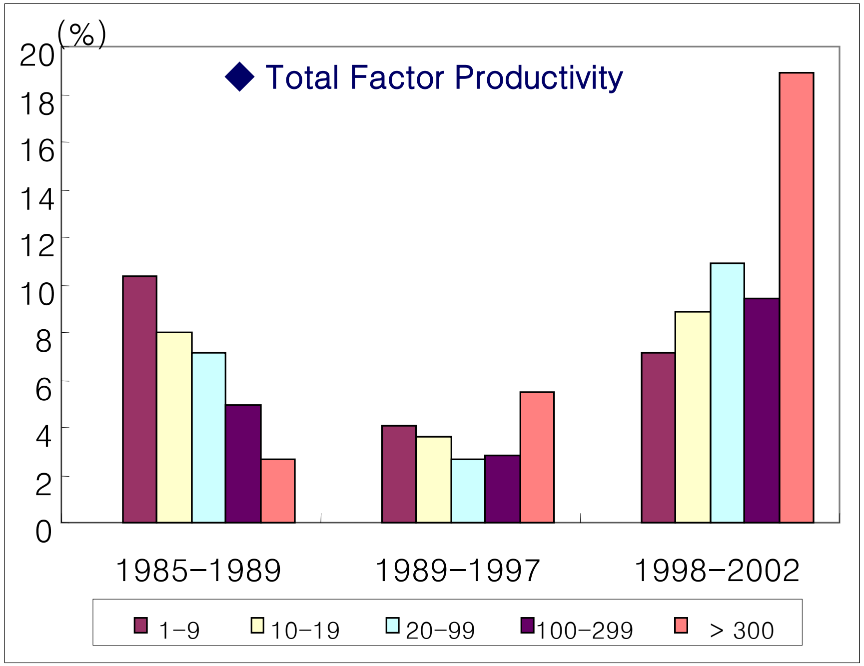
➢ **Actually productivity gaps increased across industries and across all size groups – though most pronounced in the Korea' s leading industries: electronics**

* **labor productivity: SME' s gap against large firms enlarged steadily**
* **TFP: SMEs once outperformed large firms → reversed during ' 90~' 97 → gap widening**
  – TFP growth during 1998~1991: SMEs 8.87 vs. LEs = 15.21

Productivity Gap against Large Firms



Size groups are in number of employees



Source: KDI 2003

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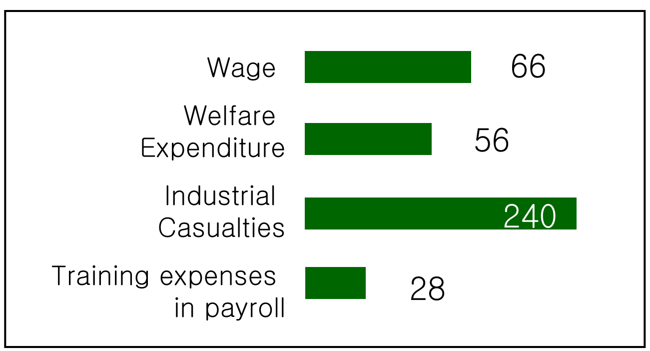
>> SMEs Productivity Gap : Sources

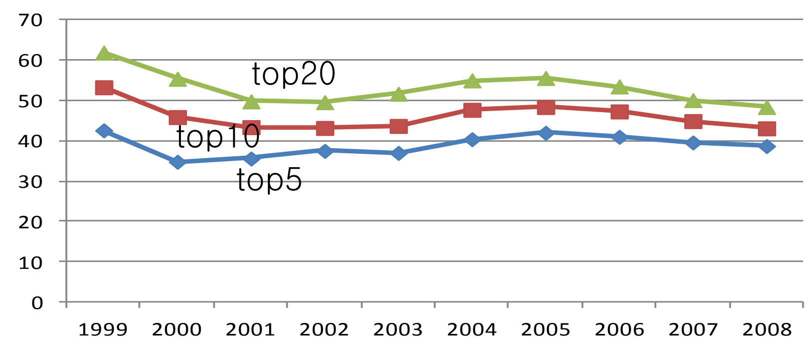
➢ **Gaps against large firms in R&D and human resources substantial/ widening**

Human Resources	▪ **wages and working conditions are inferior -> chronic labor shortage** – **esp. 1/3 of SMEs face shortage of technicians and engineers despite abundant supply of technical HS, jr. college, and university graduates (most acute in traditional industries, and small firms with employees under 50** ▪ **labor turnover ratio: 2~3 time higher than LEs**
R&D Resources	▪ **Prime R&D resources rests with big companies, esp. top 5 star companies (Samsung, LG, Hyudai Motors, etc.); about 40%** ▪ **Within SMEs, gap is widening btw NTBFs and traditional SMEs**

SMEs as against LEs (' 03, %)



R&D share of LEs (%)

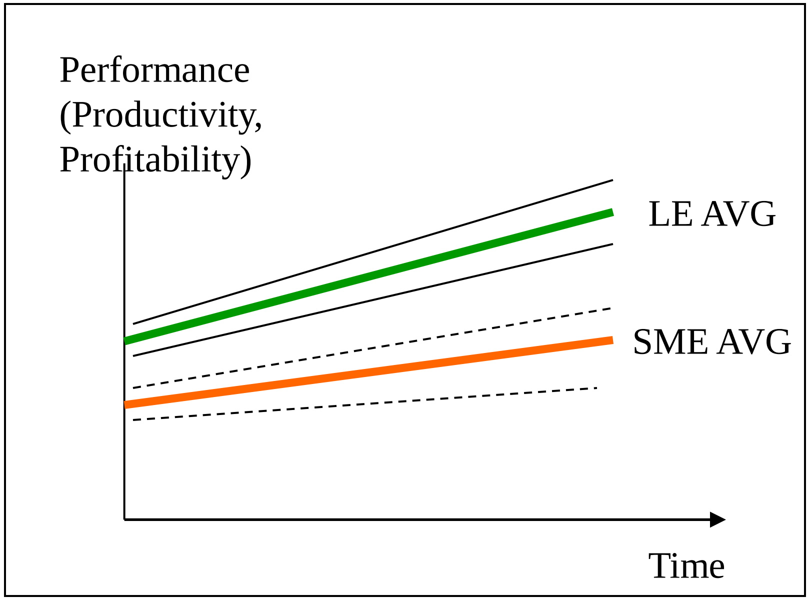


>> Polarization within the Manufacturing Sector : All-out

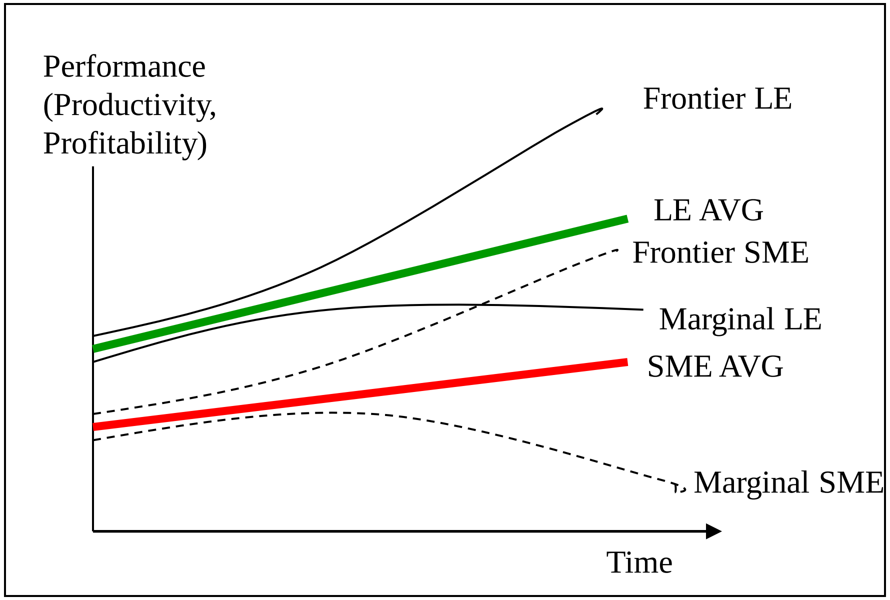
➢ **Polarization within & across businesses/industries etc.**
1) between SMEs and Large Companies,
2) Among SMEs (and among Large Companies as well)

* determining factors: individual competence for proactive response – firm size per se matters less
* NTBFs prosper alongside leading big companies & foreign MNEs; others in struggle

Traditional Pattern

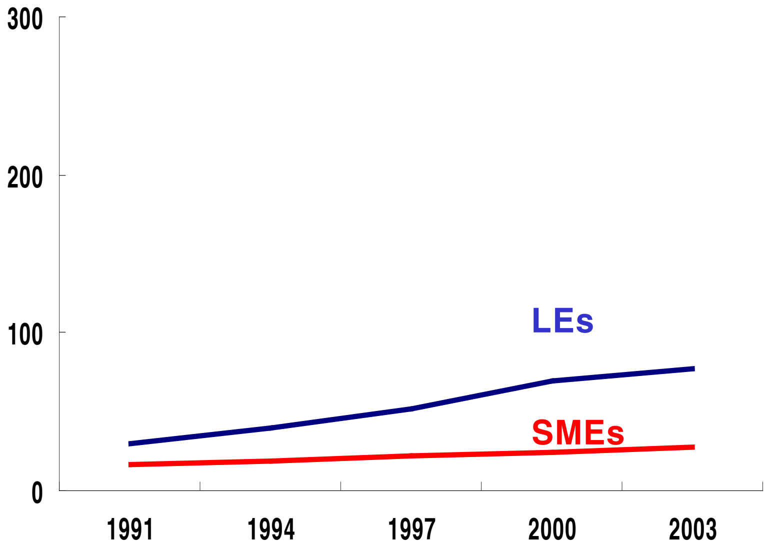


Emerging & Amplifying Pattern



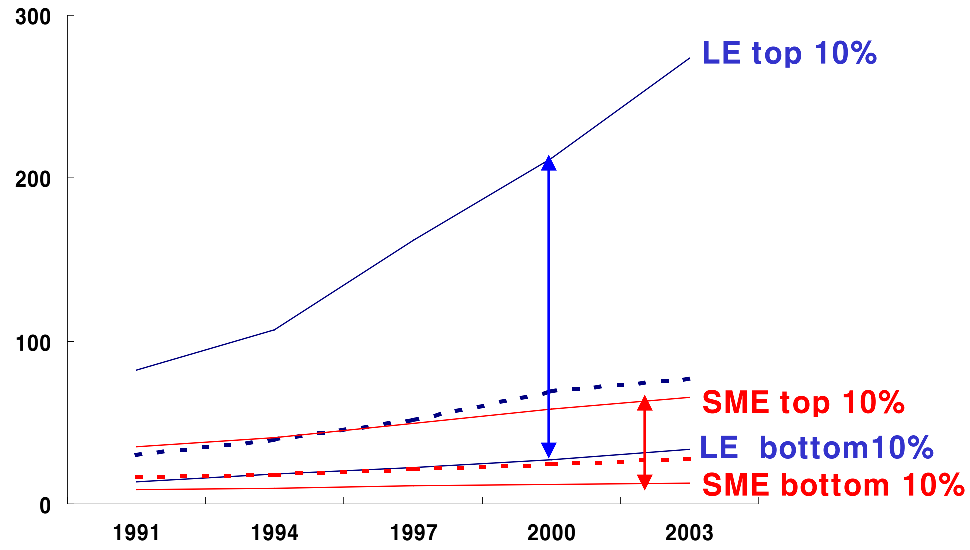
Polarization in manufacturing sector ('91~'03)
- profit rate -

〈LEs vs SMEs〉



* "median" for each

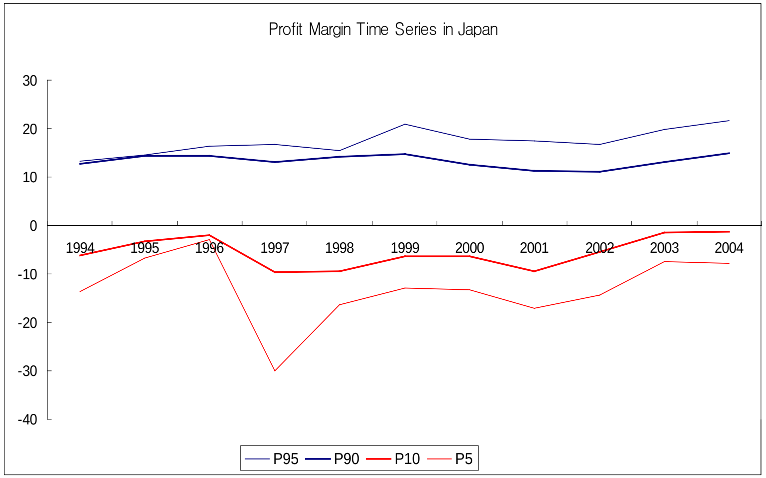
〈within LEs & SMEs〉



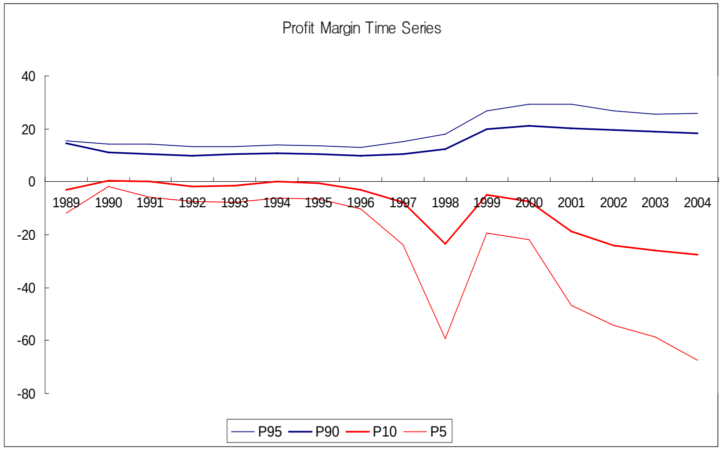
[source: Korean Manufacturing Survey]

>> Restructuring & Polarizations International comparison (profits rate trends)

<Japan>



<Korea>



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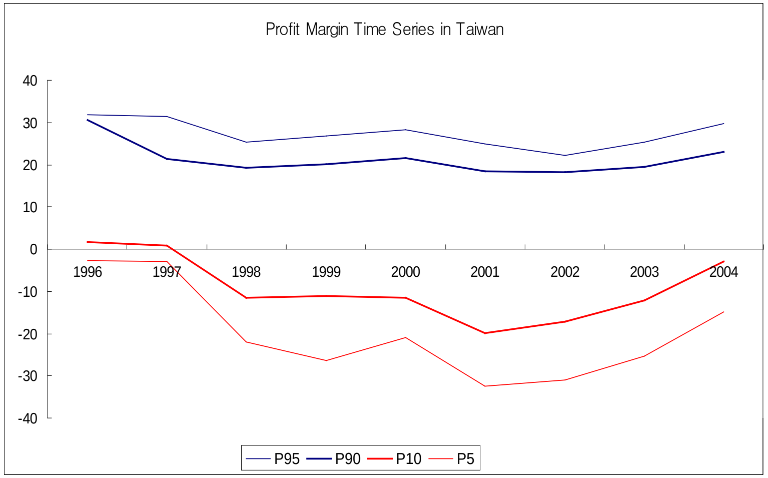


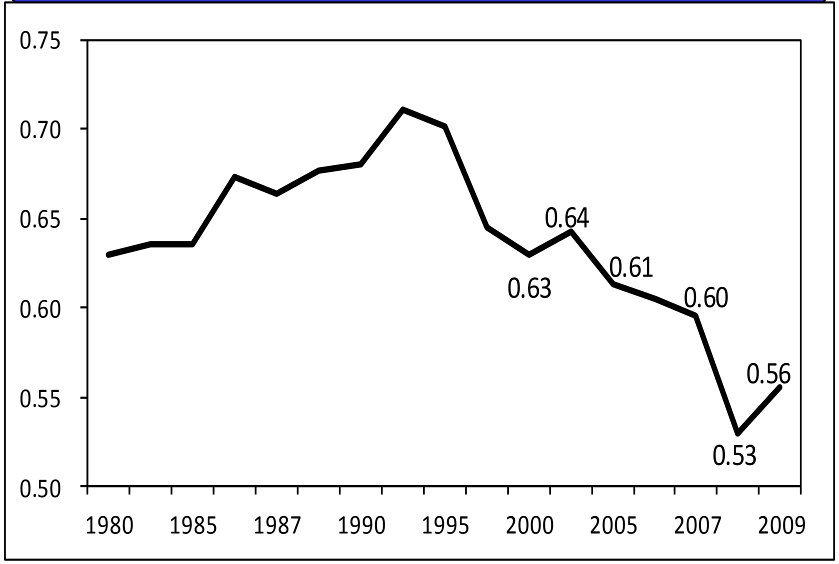
>> Parts, Materials, and Machinery – Most Critical

➢ Week SME competitiveness taxes Korea more and more ➔ Polarization btw Exports & Domestic Demand

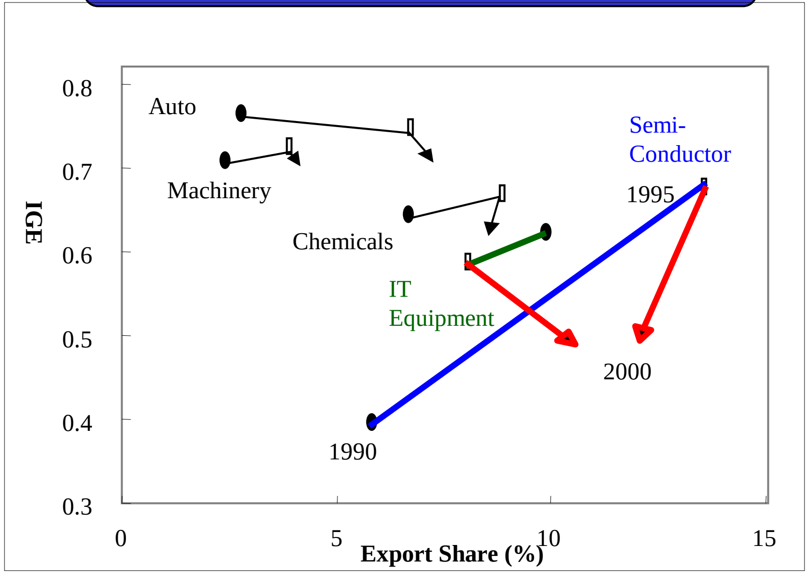
* Import-dependency keeps rising (equipment machine:94 ('98) ↗ 137 ('03))

* Spillover of exports falling since mid 90s (esp. in IT sector)
  - employment creating effect : 25.8 ('95) ↘ 15.7 ('00)

Income generating effect of exports(△GDP/△export)



Export share & Income-generating effect



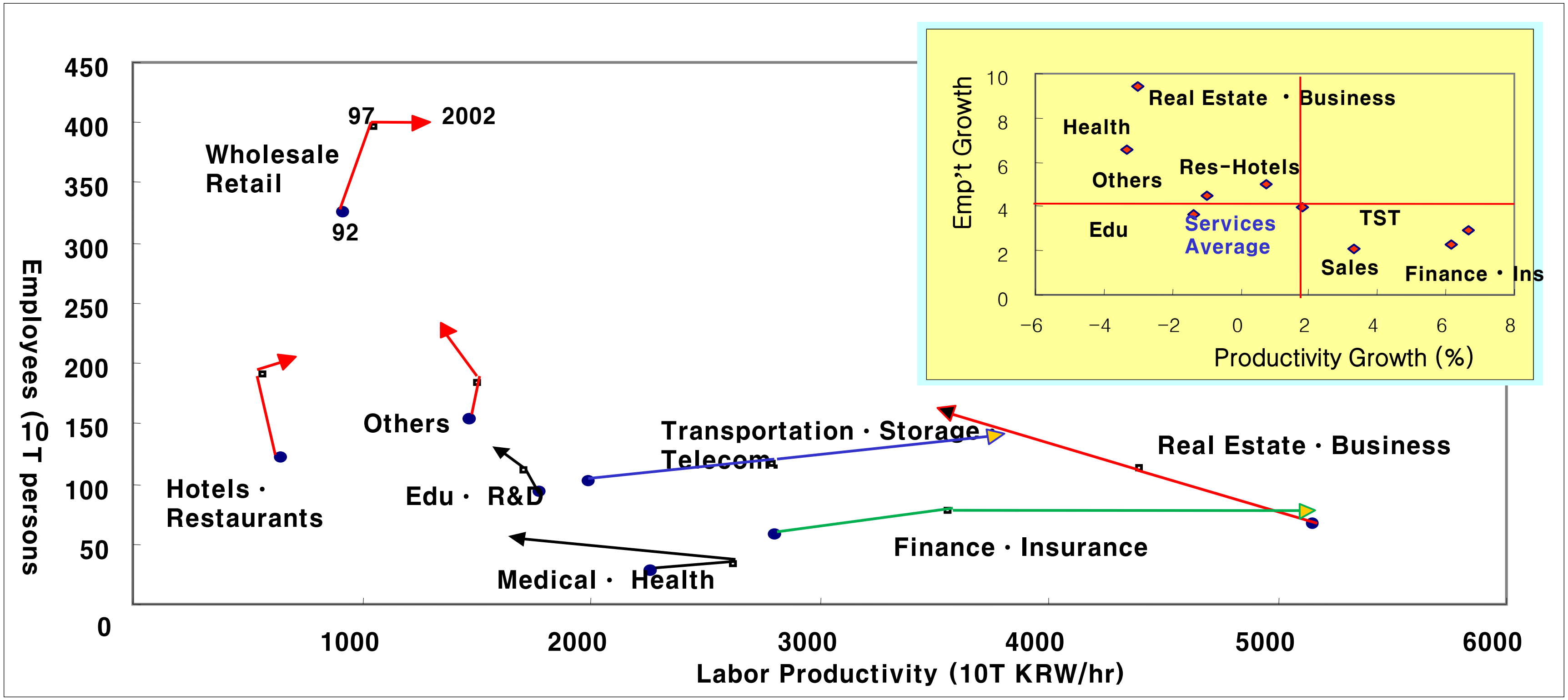
※ Income-generating effect of advanced nations: Japan 0.89 ('00), US 0.91('90)

IV. Services Sector in Korea

<< Backward Traditional Services (1/2) >

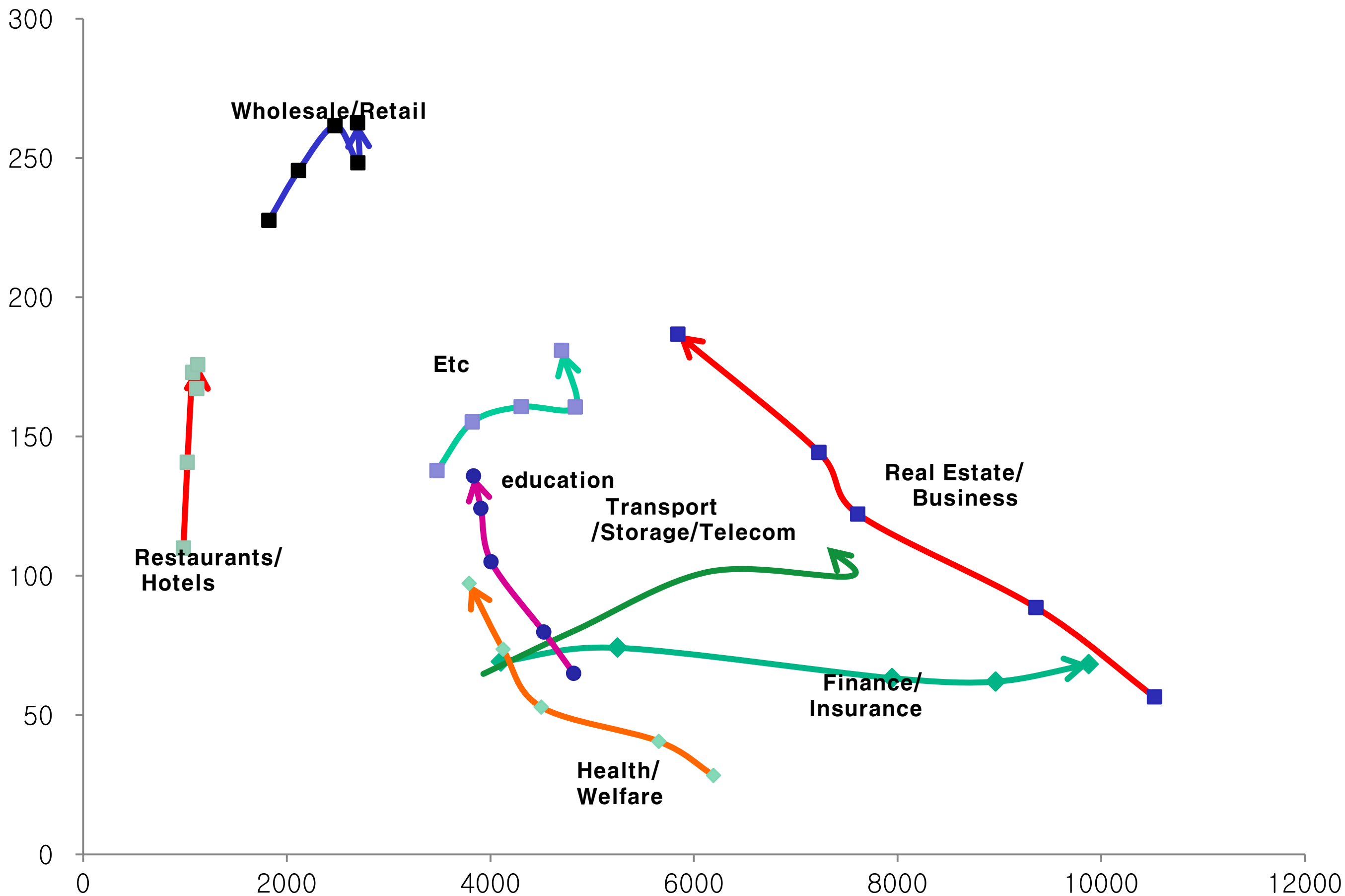
- **Since 1990, employment gain in services occurred mostly in low-productivity traditional services sector**
  - Employment in high-productivity sectors stagnant/reduced
  - Negative correlation btw productivity increase & employment gain

Productivity & Employment Changes in Korea's Services ('92~'02)



The basic pattern sustains toward 2010

Productivity & Employment Changes in Korea′s Services (′92~′08)

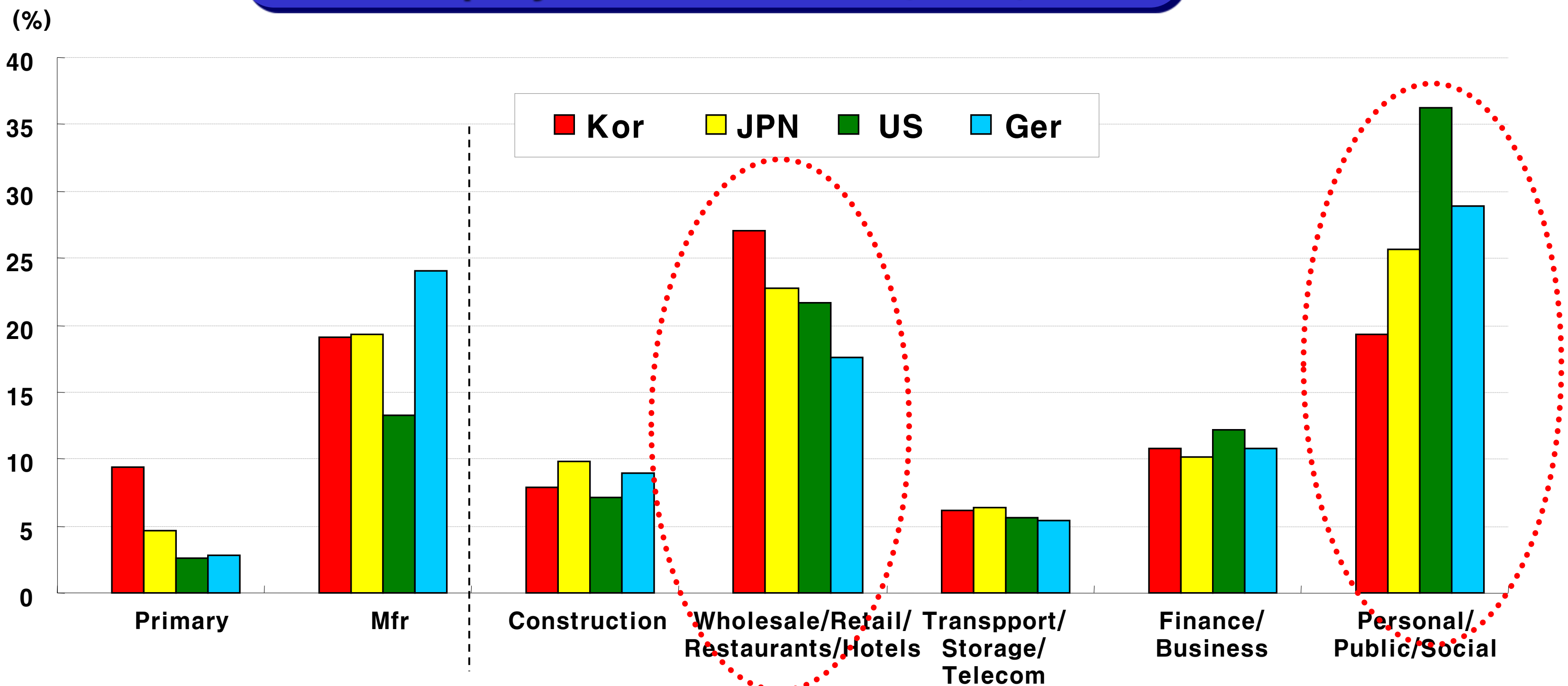


>> Gaps in Employment Structure

■ **The sector composition of services employment used to be quite different from the advanced nations**

- **high** share of **traditional sectors**: wholesale/retail/restaurants/hotels
- **Low** share of **personal/public/social services**

Employment Structure (2002)

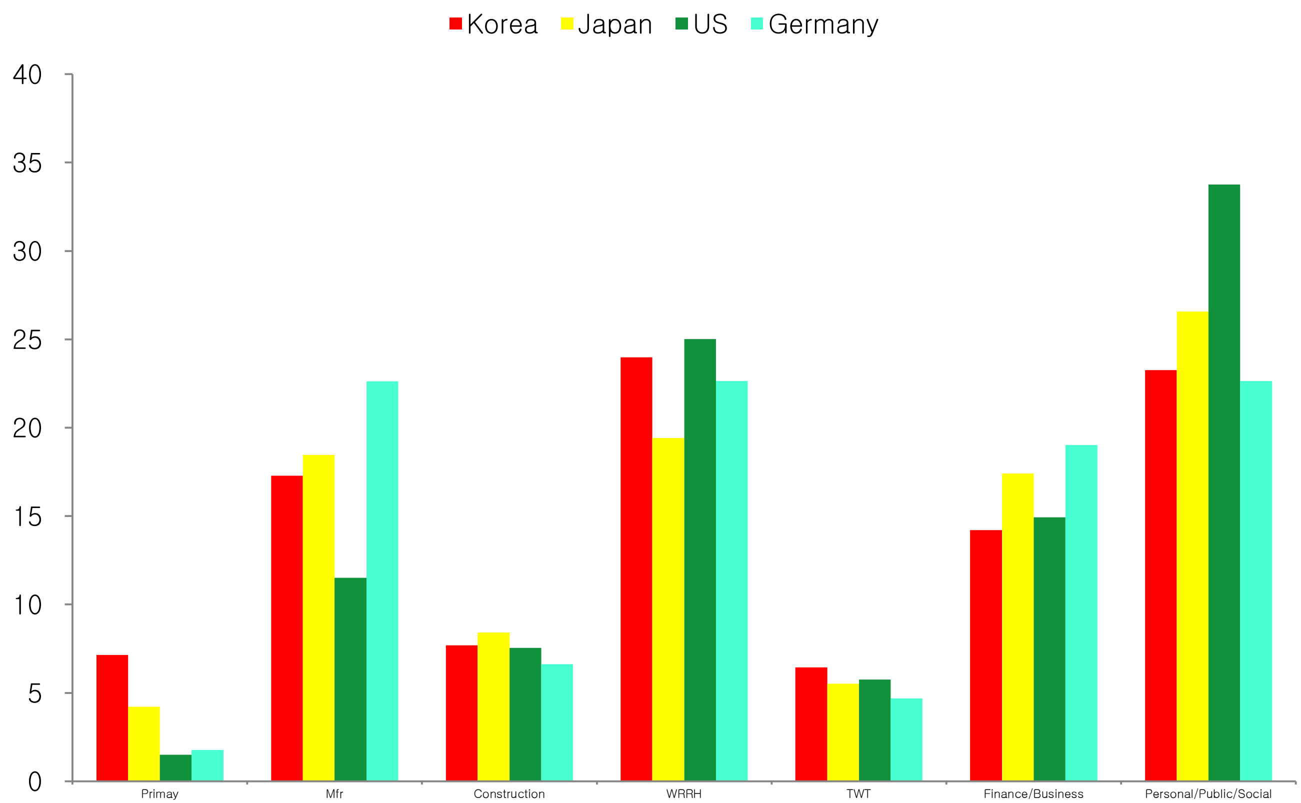


자료: OECD

A kind of assimilation/convergence observed during 2000s

- Employment structure of Korea’ s services became similar to other advanced countries

Employment Structure (2008)

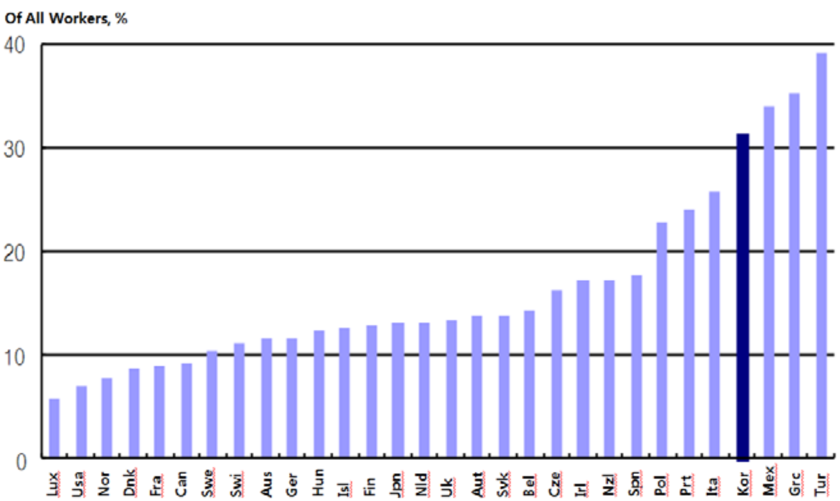


>> Self-Employers Sector in Korea

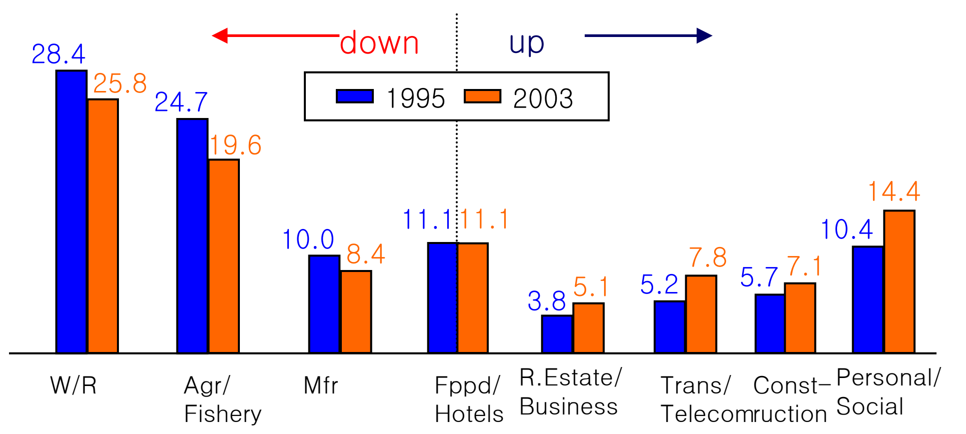
Persistent problem of easy entry and excessive presence

- Share in the whole workforce: 27~28% since 1990 (600 M in ’ 03, 27.3%)
  - * 4th highest in the OECD (US 7.3%, Japan 10.8%, Germany 10.1%, Taiwan 16.0%)
- Concentrated in : Wholesale/Retail (25.8%), Agr/Fishery(19.6%), Personal/Social services (14.4%)
- Aging under way: 40-yrs old & more 62%(’ 95) ➔ 72%(’ 03)

Employment Shares of Self-Employers (%)
Across OECD Countries



Employment Shares of Self-Employers (%)



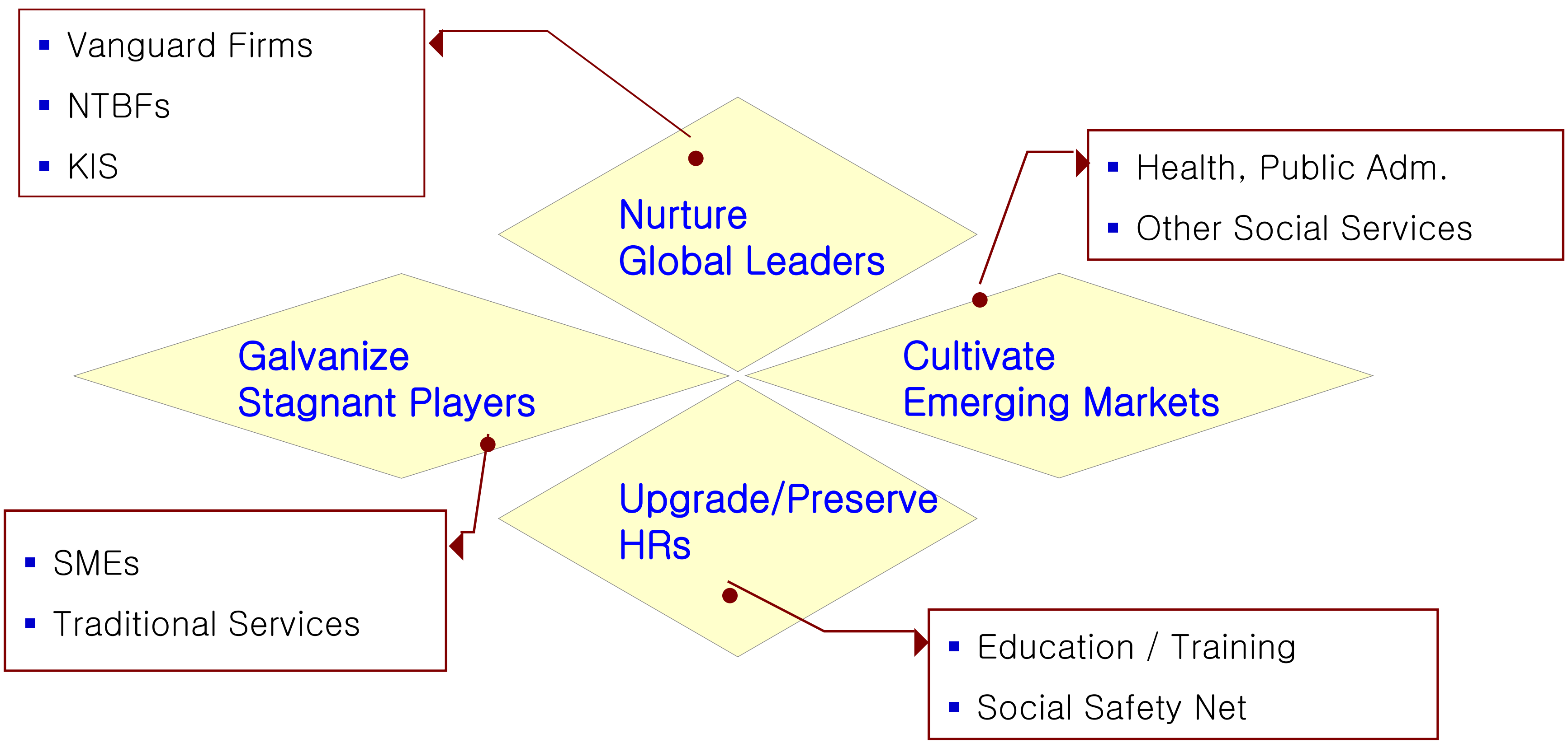
V. Prospects and Policy Agendas

>> Four Pillars of Strategy

Secure the Maximum Performance of the Fore-runners

+

Pull-out the Potentials of the Others for Self-lifting



>> Basic Perspective & Strategy

- Not a reduction of realized disparity through traditional welfare (re-distribution or protection) measures
- But ensuring of maximum economic dynamism with expansionary re-generation of productive resources

● Neither a traditional welfare approach or single minded pro-growth approach will not work because :
Korea is situated in a "low growth – high disparity" trap due to structural (not cyclical) causes

- Cross-hauling, co-development strategy for the leading sectors and backward sectors alike

● Unleash/encourage leading groups to make global players
=> strengthen "growth locomotive" for now and near future
● Re-motivate and re-empower yet-feeble (vulnerable) players to join leading groups in future
=> foundation for long-term stable growth with social cohesion

>> Policy Agendas (i)

❖ Nurture Global Leaders

- Promotion of KIS (Knowledge-Intensive Services)
  * Business Services, Culture Industries, Education
- Strategic FDI & overseas business
- Regulatory Reform
- New Labor Relations

❖ Galvanize Stagnant Domestic Players

- Upgrade SMEs : Innovation-oriented Policy
  * Revamp financial / technological support system
  * Market-based restructuring

- Revamp self-employer sector → More Quality-Jobs

>> Policy Agendas (ii)

Upgrade/Preserve HRs

- Upgrade FET system ➔ greater upward labor mobility
- ALMP for the unemployed / displaced worker ➔ Inter-generational labor mobility
- Harness Social Safety Net ➔ Social Cohesion & Greater tolerance for Competition & Reform

Cultivate Emerging Markets in Social Services

- Bring personal home-bound services into markets (e.g. health-caring of the old, child-caring)
- Expand / upgrade social employment, Nurture social enterprises
- Enhance public services with enough front-line manpower

>> Policy Environments

Ongoing recession

- ➢ Facilitate overdue ‘restructuring’
- ➢ Clear-up inherited structural burdens
- ➢ Sharpen policy on services

Full awakening to the gravity of the problems
=> Various new policy initiatives set off lately

- Comprehensive plan to upgrade services
- Pursuit of FTAs (Korea-US (2010) => as vs. China, Japan, etc)
- Switch to innovation-oriented SMEs policy (& start-up)
- Creative Economy Initiative (current government)

Favorable market factors

- HR base / Learning Capacity
- New trends in services

But great adversities as well

- Pension reform, Education reform
- Financial resources, etc.

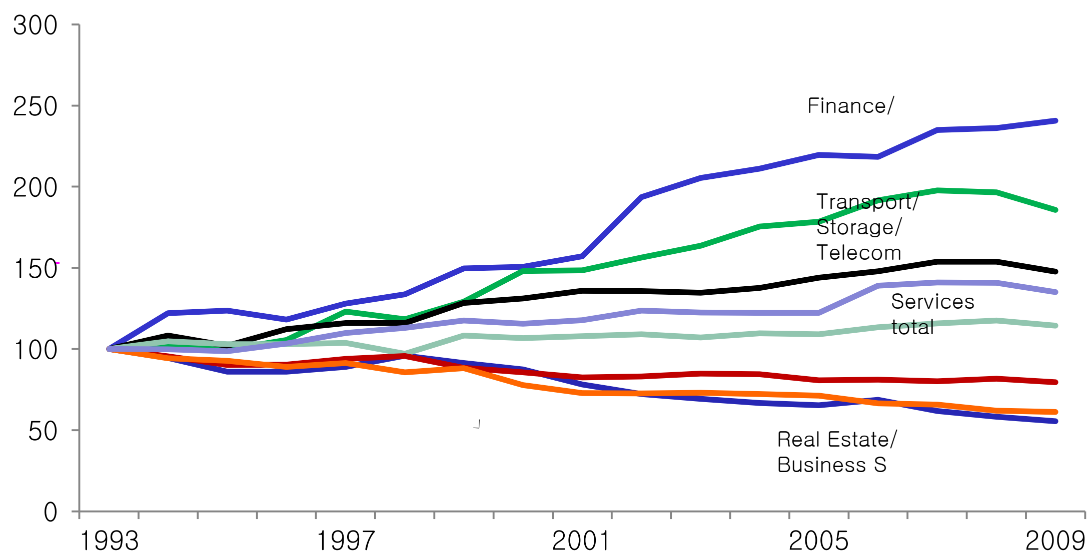
>> Emerging Trend in Korean Service Sector

Toward late 1990s, a new trend appears to set in.

- **The modern business-related sectors started to pick up in productivity, compared to traditional sectors**
- **After 2000, the service sector created most high-paying permanent jobs**
- **Services trade balance started to improve recently (led by banking. logistics)**

Productivity Changes in Services by Sectors (1993-2009)

Level relative to yr. 1993 (= 100)



[Ref] Promising Services in Korea

❖ Cultural Industries

- **Leapfrogging performance:** Cinema · Broadcasting · Game etc.
  - GDP share ('02) 6.6%, Average growth rate ('99~'02) 21.1% (World average 5.2%)
- Domestic and foreign demand likely to keep growing fast
  (40 hrs working, Growing exports to Asian market (success of Korean dramas)
  - Export growth rate ('03, %): Movies 127, Game 50, Broadcasting 30, Characters 24

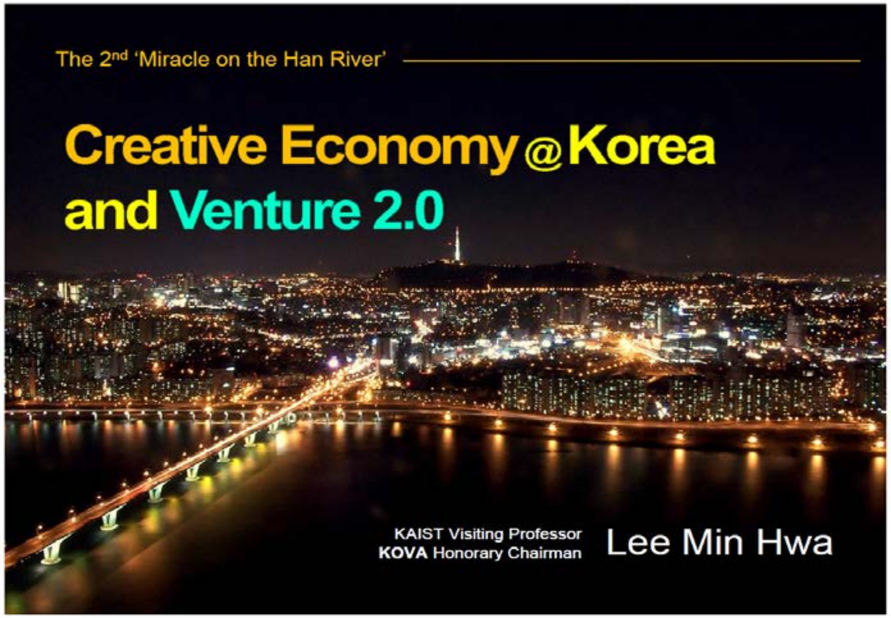
❖ Business Services

- **IT-related services & professional BS are growing fast**
  - Professional BS : Employment growth 7.7%
    Labor productivity growth 30% (annual average, '99~'03)
- For now, local firms are feeble and subject to restructuring pressure (excessive market entry after the financial crisis)
- But good potential to settle and prosper after transitional period – led by foreign MNEs and a group of small, local innovative firms

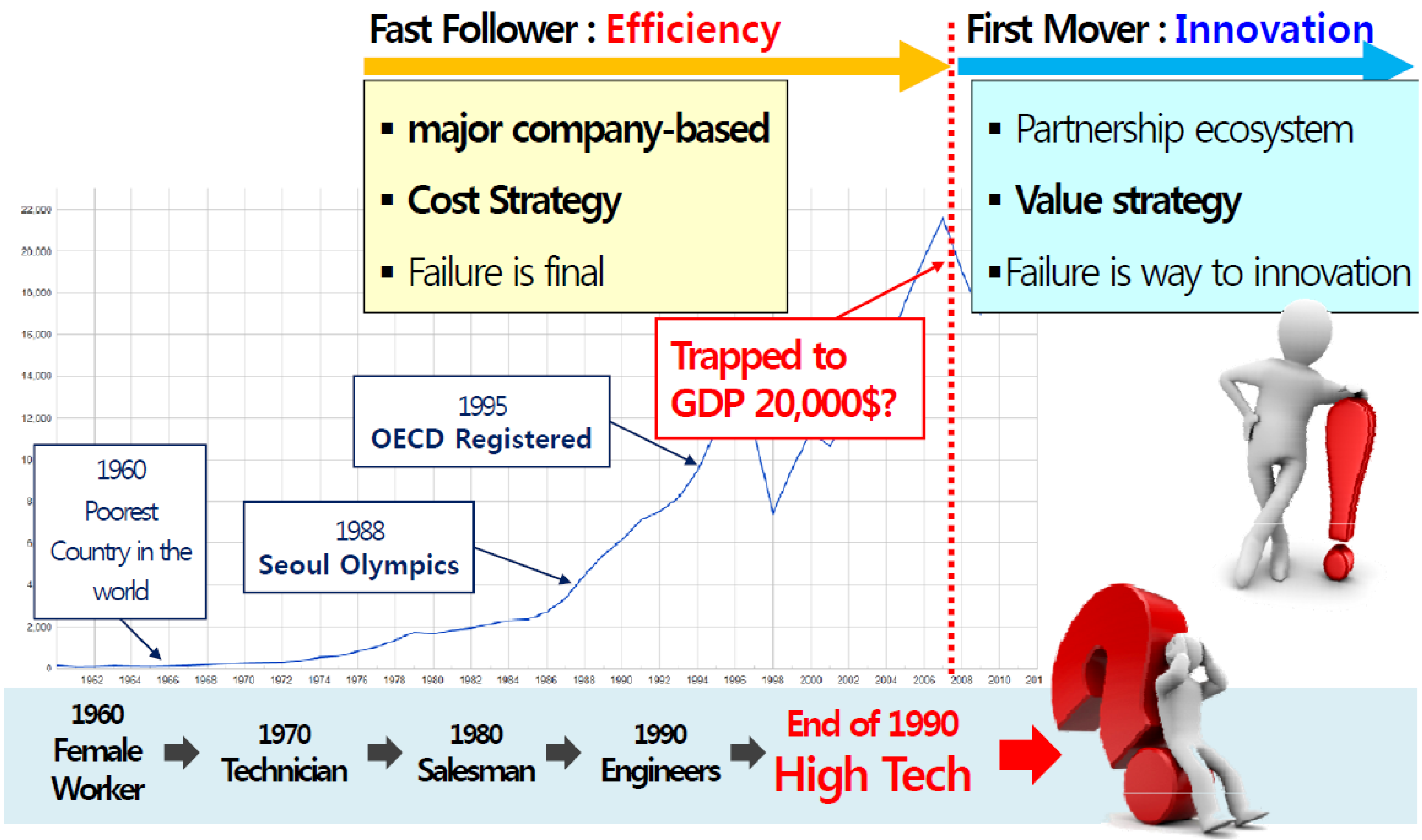
❖ Social Services

- Demand conditions are maturing, and many foreign cases to refer to
  - With prudent public investment to ferment the market and with appropriate institutional arrangements in place, can develop into a self-sustainable industry

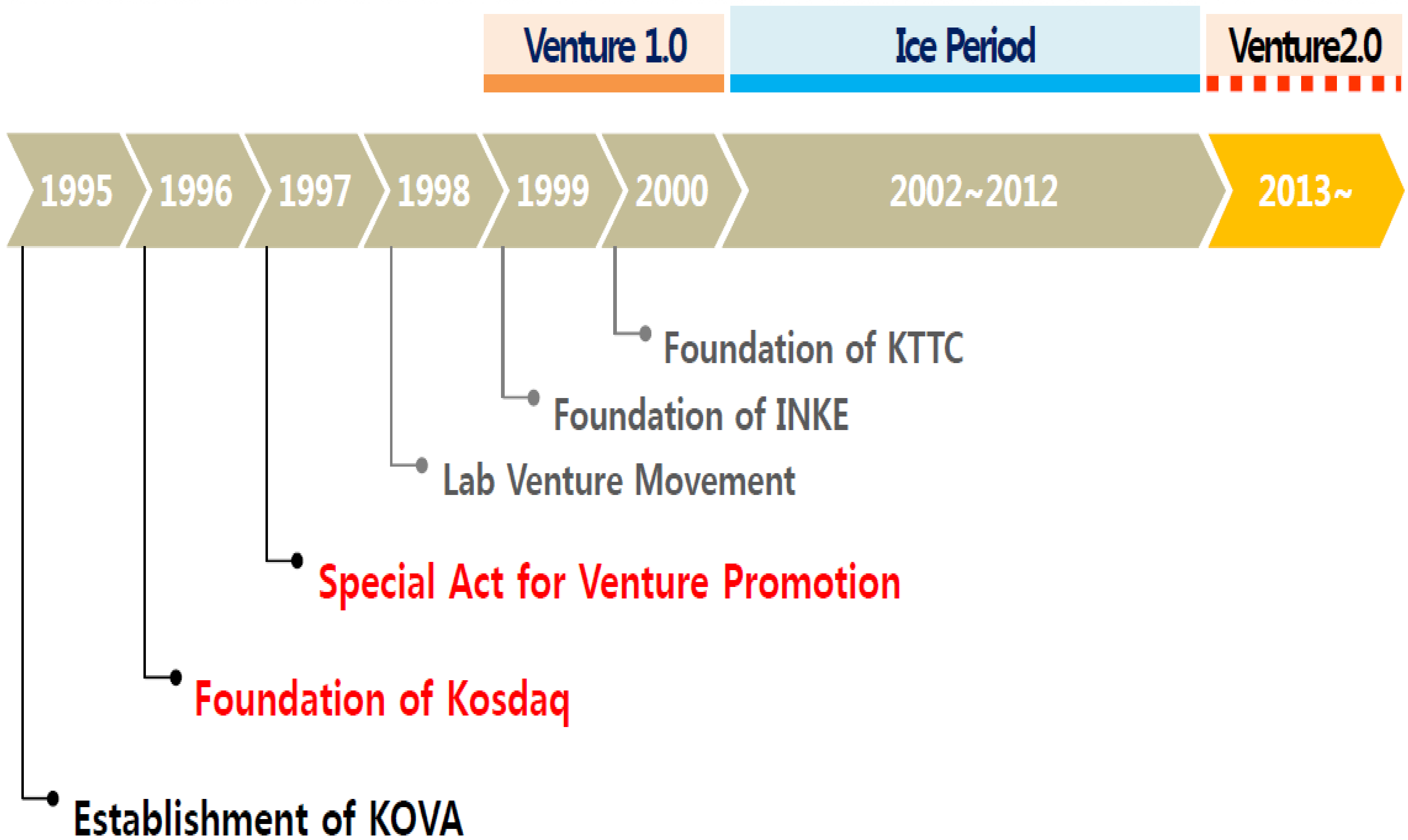
[Annex] Venture Business and Creative Economy@ Korea



Advent of Creative Economy

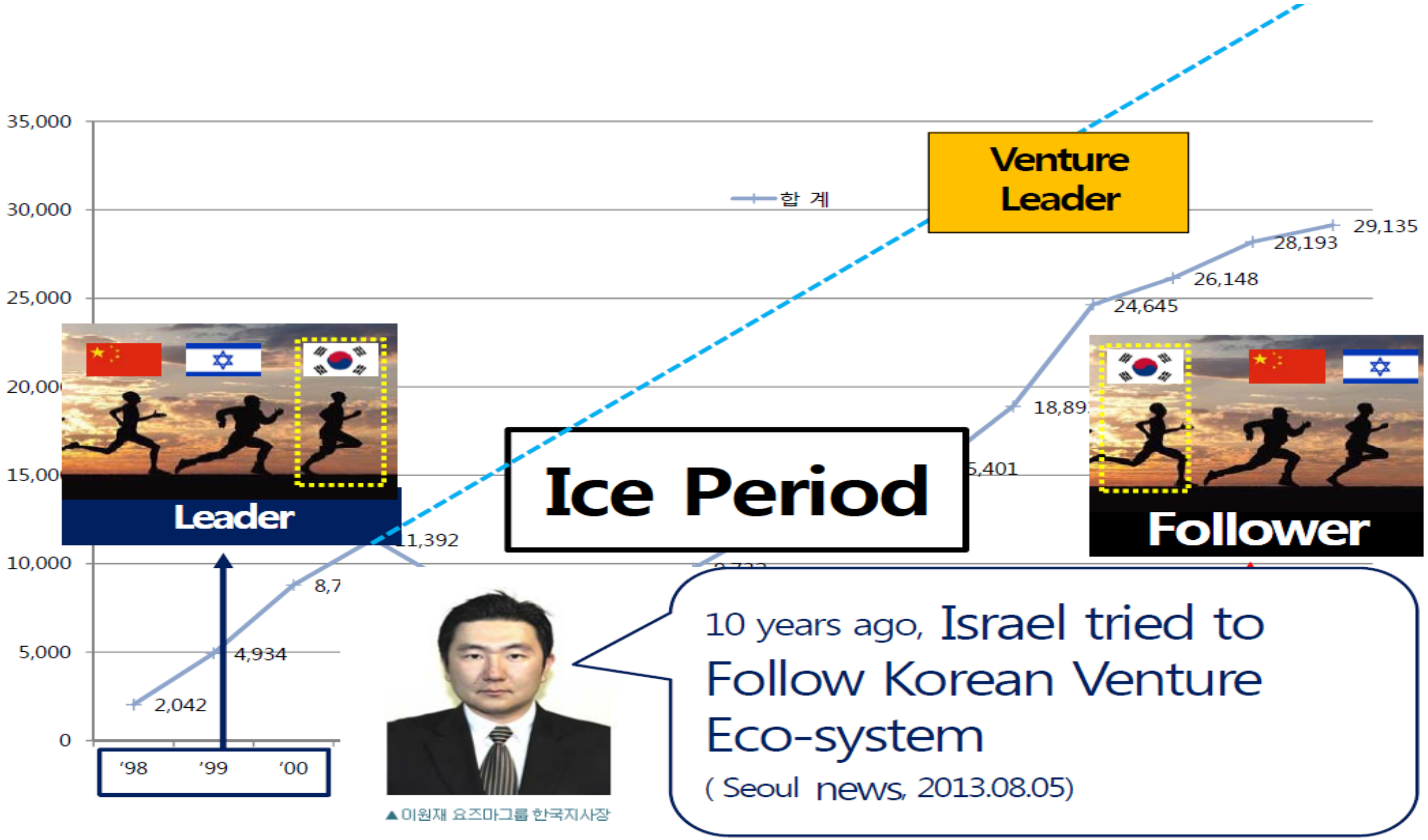


Brief History of High-Tech Startup in Korea



KDI

ICE Period of Korean Venture



KDI

Venture – 19years Summary

Total Revenue
USD 300 Billion > SAMSUNG

- Annual Increase Rate 15%
- Economic Growth contributed more than 1.5%

USD 100 Million Venture- 454
▶ USD 100Billion ('13)

8 USD 1B$ Venture Appeared

National Growth & Employment

Israel	Korea
8M Population	50M Population
4,000 startup	30,000 startup
Innovation	Innovation & Productivity

KDI

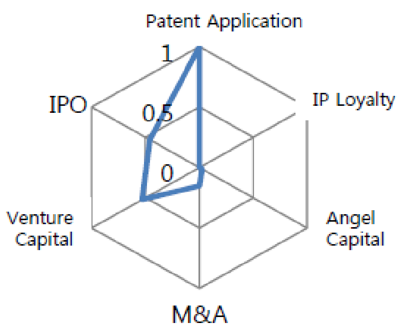
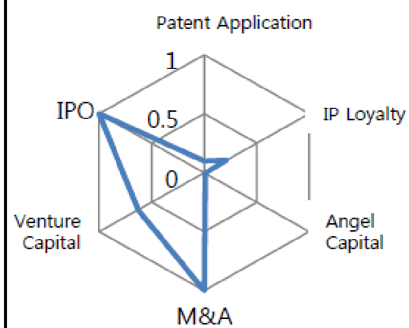
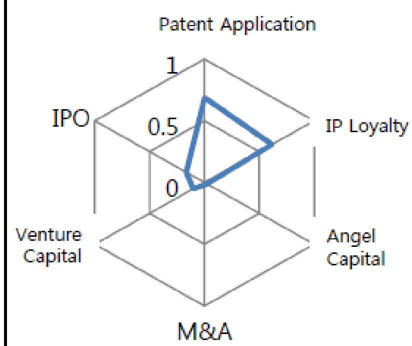
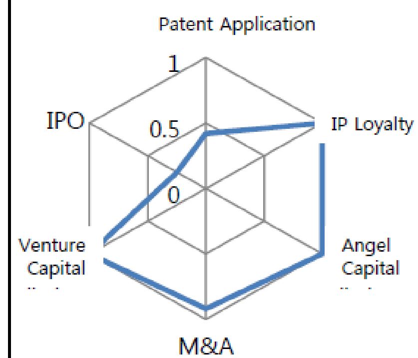
Korea's Creative Economy is
Creative-Industralizing all Industries
Creative Economy 2.0

Individual Tech ▶▶▶ Meta-technology

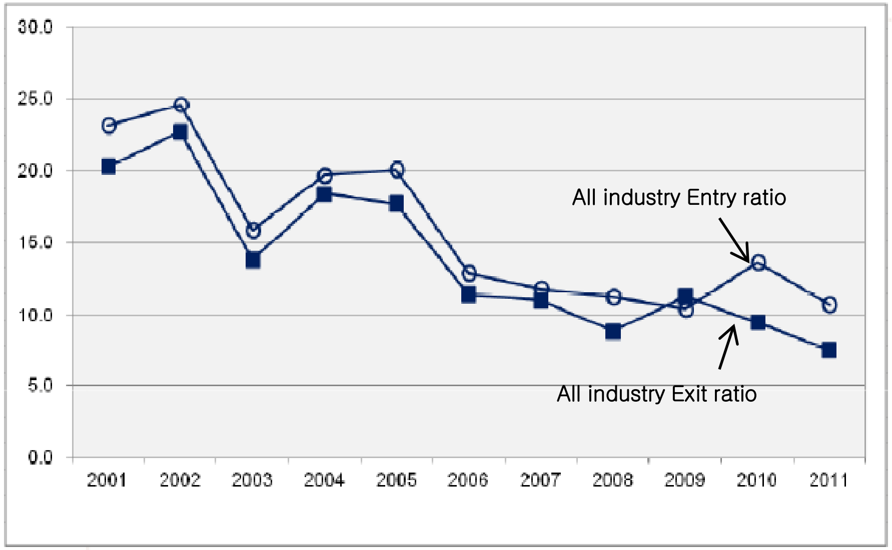
Solo Innovation ▶▶▶ Ecosystem Innovation

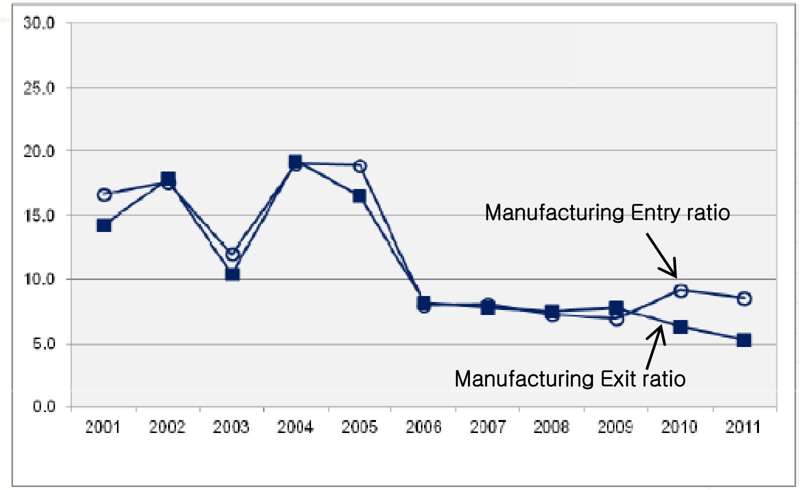
Vertical Systematization ▶▶▶ Open Platform

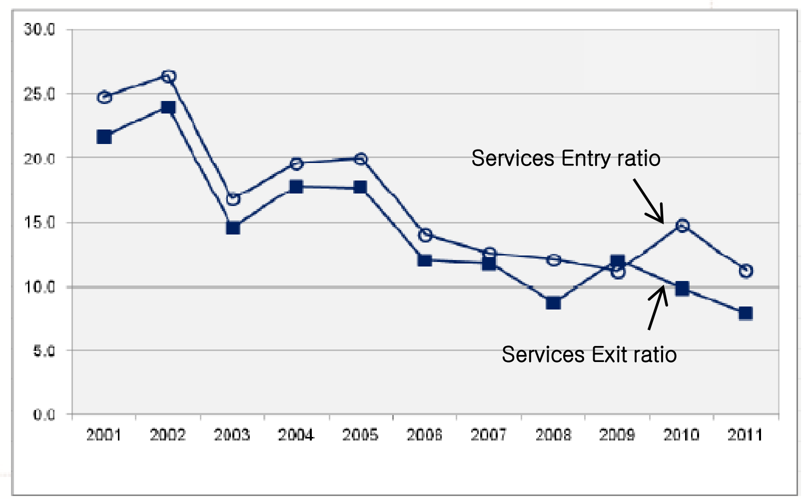
Venture Ecosystem Type and Feature

Korea	China	Japan	USA
			
Supply-centered	Market-oriented	Technology-oriented	Balanced
• Highest patent applications relative to populations • Insufficient excellent patents	• Patent application amount increased • Can't keep up with economic growth	• 340,000 patent applications per year • Increasing IP loyalty	• 500,000 patent applications per year • High quality of patents
• Angel capital, , lowest M&A	• University Technology holdings company as angel capital • $20 billion scale M&A market	• Similar to Korea	• Overwhelming scale of Venture capital • $ 40 billion scale of M&A market
• Venture Capital with a scale of $1.2 billion	• $ 9,000,000,000 scale venture capital • World's largest IPO market relative to GDP	• $ 1.2 billion scale venture capital	• $ 29 billion scale of venture capital • World's largest IPO market

Firm Dynamics in Korea
Entry and Exit Ratios(2001~2011)

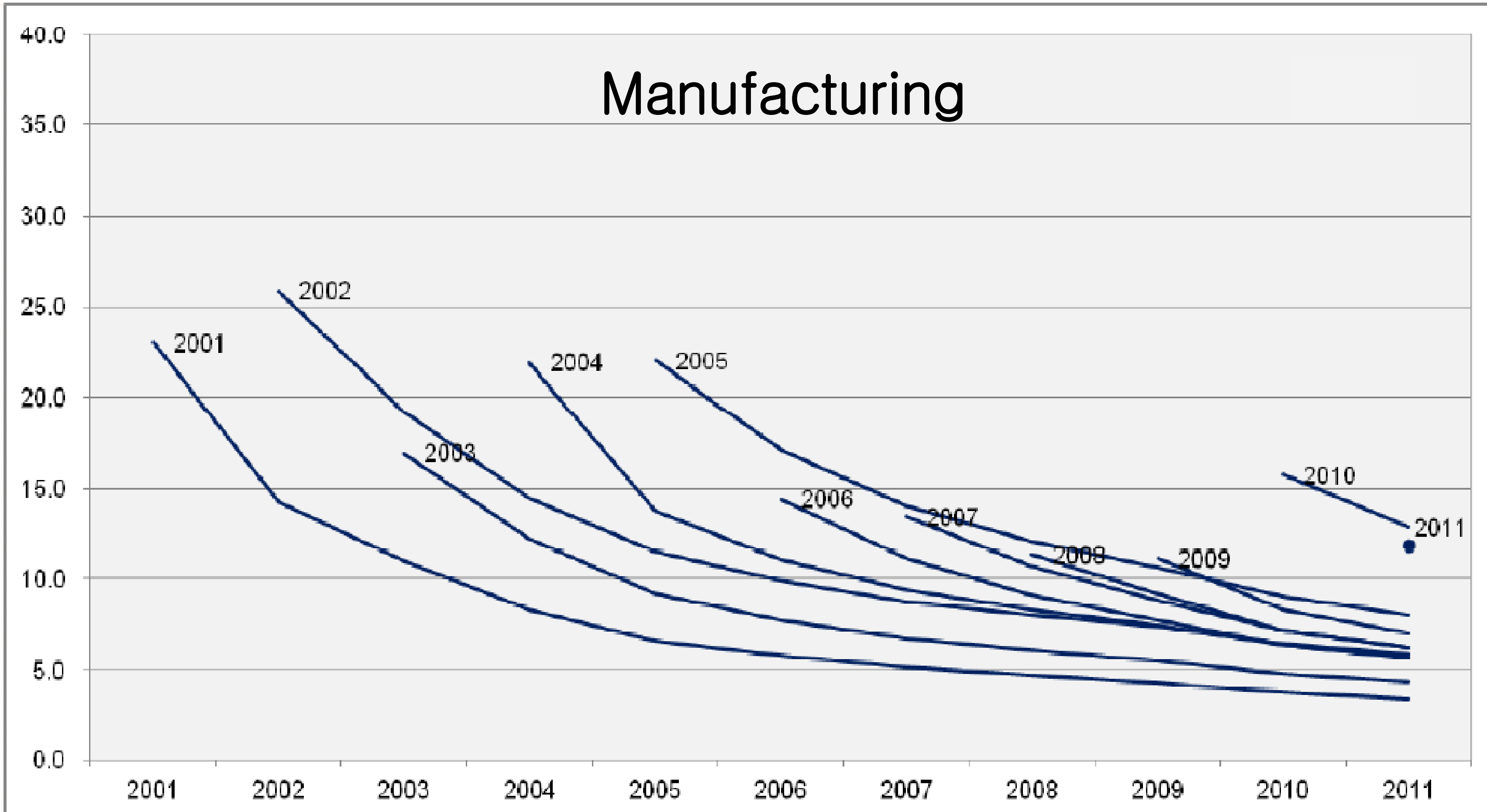






Source : Sanghoon Ahan, “Structural Changes and Creative Destruction in the Korean Economy”, Nov. 2013, KDI(PPT presentation)
Data Source: Whole country Company Survey, employee standard

Firm Dynamics in Korea
Entry and Survival by Entry Cohorts(2001~2011)



Source : Sanghoon Ahan, "Structural Changes and Creative Destruction in the Korean Economy", Nov. 2013, KDI(PPT presentation)
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