Government policy and growth of technology entrepreneurship in South Korea

International workshop on technology-based entrepreneurship

Session I – Technology based entrepreneurship: concepts, models, policies and successful programs

Tehran, October 27-28, 2015
Key messages

The South Korean growth story has been remarkable, and largely driven by significant investments into industrialization and R&D.

However, the chosen path of substitution strategy has created an ecosystem that now finds itself at a cul-de-sac.

There is a large effort in changing into a creative economy, but change is progressing slowly.
Among the Asian nations, Korea’s growth rate has been stunning and is only surpassed by China.

Countries with highest GDP growth (excluding China)

Real 2000 GDP

Source: Prof. Jaehoon Hahn, Yonsei University, *Introduction to the Korean economy and society* (lecture)

South Korea has been investing heavily into R&D over the last decades

**Spending on R&D**
Percent of GDP

This has also led to good results – South Korea is world leading in many technology industries

Korea’s position worldwide in selected industries

• Number 1 in DRAM memory chips with 66% global market share
• Number 1 in LCD displays with 51% global market share (LCD panels)
• Number 1 in mobile phone market share
• Number 1 in shipbuilding with 51% global market share
• Number 5 in autos, with 4.7 million vehicles in 2011
• Number 5 in refinery capacity
• Number 6 in global steel production

Source: MGI, Beyond Korean style: Shaping a new growth formula (April 2013)
However, South Korean growth is perhaps less a matter of a miracle, and more a matter of investment (capital input growth)

Perspective on growth drivers

The Economist: June 3, 1995

“The World Bank reckons that nearly two-thirds of the growth between 1960 and 1989 reflects the accumulation of inputs rather than improvements in efficiency.

That assessment may be over-generous. Lawrence Lau, another economist at Stanford, has calculated that the growth of inputs, particularly of capital, accounted for between 86% and 100% of South Korea's growth.

In other words, the efficiency with which those inputs are used may actually have been declining. By contrast, efficiency gains accounted for two-thirds of the growth in France and the former West Germany.”

Source: Prof. Jaehoon Hahn, Yonsei University, Introduction to the Korean economy and society (lecture)
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Recent news paint a dire picture of the employment situation – the gap is widening and non-regular employment is growing

### Unemployment in the news

**Soaring Unemployment Rate**

Unemployment Rate Soars to 4.6% in February from Mid-3% last Year

- With hidden unemployment included, the total figure is 12.5%
- Youth unemployment (ages 15 to 29) exceeded 11%
- Non-regular workers constitute over 30% of all employed (over 6 million people are non-regulars)
- Average monthly salary for regular workers was 2.3kUSD, for non-regulars only 1.3kUSD (55%, decreasing from 62% ten years earlier)

While GDP is growing, wages are not keeping up

Real GDP versus real average wage

Source: MGI, Beyond Korean style: Shaping a new growth formula (April 2013)
While the large corporations have high productivity, the small end medium enterprise (SME) sector is not productive at all

The productivity problem

Suicides are high, while fertility is low, driving rapid aging

Suicide and fertility rates

Source: Prof. Jaehoon Hahn, Yonsei University, *Introduction to the Korean economy and society* (lecture)
Korea (and Japan) pursued substituting strategy, Taiwan and Singapore pursued complementing strategy – with effects on SME landscape

### Comparison on national growth models

<table>
<thead>
<tr>
<th>Korea (substituting strategy)</th>
<th>Singapore (compl. strat. – int’l)</th>
<th>Taiwan (compl. strat. – semi-int’l)</th>
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</thead>
<tbody>
<tr>
<td><strong>State</strong></td>
<td><strong>Government</strong></td>
<td><strong>Government</strong></td>
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<tr>
<td><strong>Banks</strong></td>
<td><strong>GLCs</strong></td>
<td><strong>Banks</strong></td>
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<tr>
<td><strong>Promotion</strong></td>
<td><strong>MNCs</strong></td>
<td><strong>JVs</strong></td>
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<tr>
<td>Loan guarantees, mutual assistance</td>
<td><strong>SMEs</strong></td>
<td><strong>SMEs</strong></td>
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<td><strong>Marginalisation</strong></td>
<td><strong>Sub-contracting</strong></td>
<td><strong>Support</strong></td>
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<tr>
<td><strong>SMEs</strong></td>
<td><strong>MNCs</strong></td>
<td><strong>MNCs</strong></td>
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</tbody>
</table>

Note! Unlike Japan, Taiwan and Singapore, Korean model required significant outside financing (debt)

Note: MNC = multinational company, SME = small and medium sized enterprise, GLC = government linked company
Source: Shin, Chang, *Restructuring Korea Inc.*, pp. 11-22
Gerschenkron's pattern of industrialisation sheds light on how nations catch up and applies also to post-war Japan and Korea

### Gerschenkron’s patterns of industrialisation – substitution strategy

<table>
<thead>
<tr>
<th>Elements of strategy</th>
<th>Britain</th>
<th>Germany</th>
<th>Russia</th>
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</table>
| **Timing of entry**  | • Late 18th century  
• Forerunner | • Mid 19th century  
• Moderately back-ward | • Late 19th century  
• Extremely back-ward |
| **Spearheading institutions** | • Individual entrepreneurs  
• Banks providing operating capital | • Universal banks (combining investment and commercial banking) | • State (could not rely on private sector due to low standards of honesty; state took over task of devising catch-up strategy and implementing it) |
| **Functional patterns** | • Gradual accumulation of capital  
• Less organized | • Mobilising resources through banking system and concentrate them on heavy industries  
• "Bigger and bigger" plants | • Coercive mobilisation of resources and focus on heavy industries  
• Still "bigger and bigger" plants |

Source: Shin, Chang, *Restructuring Korea Inc.*, pp. 9-10

Key driver was competition among these nations for military and industrial might
Government support and (temporary) labor cost advantage has played a key role in the evolution of many industries, such as shipbuilding.

### Development of the world’s shipbuilding industry

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<tr>
<td><strong>Key events</strong></td>
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<tr>
<td>Europe takes the lead</td>
<td>• After World War 2, post-war trade boom starts, driving demand</td>
<td>• Rapid growth of Japanese economy</td>
<td>• Lower wages</td>
<td>• Economic boom of China</td>
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<tr>
<td></td>
<td>• Highly advanced ship component industries in Europe</td>
<td>• Government support for low cost leadership</td>
<td>• Covered more sophisticated vessels as segmentation strategy</td>
<td>• Strategic choice by gov’t to develop heavy industry</td>
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<td>• European shipbuilding technology enabled lower manuf. cost than other countries</td>
<td>• Parallel shipbuilding</td>
<td>• Gov’t full support of shipbuilding as a strategic industry</td>
<td>• Significant increase of world fleet (trade growth) created more opportunities to Chinese shipbuilders</td>
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<td></td>
<td></td>
<td>• Energy crisis forced companies to move towards lower operating cost structures</td>
<td>• World trade growth and yard expansion</td>
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<tr>
<td><strong>Implications</strong></td>
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<tr>
<td>Europe takes the lead</td>
<td>• 80% of world shipbuilding in Europe</td>
<td>• Japan and Europe dominated the industry with combined 90% of overall market share in the early 1970s</td>
<td>• Global market changed rapidly following the strategy of Korea</td>
<td>• China captured over 20% of global ship deliveries in 2008</td>
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<td></td>
<td>• Strategy later changed to global specialization and advanced technology, as Europe was challenged by Japan that had lower cost</td>
<td>• However, emerging countries such as Korea and China due to shifting trend</td>
<td>• Korea captured a world market share of 25% by the mid-1990s</td>
<td>• Currently the low cost leader in the world</td>
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<td>• Reached the world number one position by 2005</td>
<td>• Having largest avg. size of shipbuilding companies in the world</td>
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</tbody>
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After 2002 China has been rapidly growing its market share, showing the results of catching up in real life.

Market shares of major shipbuilding regions, 1970-2008
CGT completed and delivered

The South Korean growth story has been remarkable, and largely driven by significant investments into industrialization and R&D.

However, the chosen path of substitution strategy has created an ecosystem that now finds itself at a cul-de-sac.

There is a large effort in changing into a creative economy, but change is progressing slowly.
In 2013, President Park’s “creative economy” policies infused the startup ecosystem with capital and culture

South Korea and the President’s “creative economy” plan

“South Korean government has plans to invest 8TKRW (8BUSD) in 2015 to foster a start-up ecosystem, new industries and markets with growth potential” (1.7BUSD into venture ecosystem and support of SMEs)

• Innovation centers (one-stop hub)
• 1:5 fund matching
• Legitimization of entrepreneurship

With an influx of government capital, the ecosystem has quickly grown – but one can question how effectively the money is spent.

Korean startup ecosystem and players (2014)

Unclear if all this has really created better growth startups – a lot of money flows into secondary expenses.

Source: Technode
Ten Korean companies have reached the “Unicorn Club” (valued at over 1BUSD), but few are internationally well known.

Valuations of Korean IT startups (MUSD)

Silicon Valley has 39 “unicorns”

Top Korean startups have focused primarily on mobile gaming, e-commerce and social platforms

Source: Strong Ventures, TechinAsia
*Valuations over 1BUSD by public or private market investors; valuations estimates are indicative only.
However, the Korean startup ecosystem have yet to see a wave of IPOs or M&A (trade sale) activity.

**Total M&A deals in South Korea (H1 2014)**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Total Deals</th>
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</thead>
<tbody>
<tr>
<td>Industrials &amp; Chemicals</td>
<td>40</td>
</tr>
<tr>
<td>Financial Services</td>
<td>24</td>
</tr>
<tr>
<td>Technology</td>
<td>22</td>
</tr>
<tr>
<td>Consumer</td>
<td>13</td>
</tr>
<tr>
<td>Transport</td>
<td>11</td>
</tr>
<tr>
<td>Construction</td>
<td>8</td>
</tr>
<tr>
<td>Pharma, Medical &amp; Biotech</td>
<td>7</td>
</tr>
<tr>
<td>Business Services</td>
<td>6</td>
</tr>
<tr>
<td>Leisure</td>
<td>5</td>
</tr>
<tr>
<td>Media</td>
<td>5</td>
</tr>
<tr>
<td>Energy, Mining &amp; Utilities</td>
<td>3</td>
</tr>
<tr>
<td>Real Estate</td>
<td>2</td>
</tr>
<tr>
<td>Defence</td>
<td>0</td>
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</tbody>
</table>

**Compare with 403 deals in the USA**

**Primary drivers for lack of M&A**

- Large conglomerates like Samsung are not buying Korean technology companies – do not contribute to M&A deal flow of startups
- Return for investors is low; the low expected valuations for exits in the Korean M&A market influence the valuations at venture capital rounds (expected average return of 2x at exit)
- To counteract this, Yello Mobile, founded in 2012, has so far acquired 74 apps for its portfolio (61 in 2014); Yello is targeting an IPO on NASDAQ in 2016, aiming to create a “roll-up” type exit path for Korean tech startups

Source: Merger Market (Korea - H1 2014)
Valuwalk, (US deal count representing technology services only as of 2/28/2015)
Government policy is key to a nation’s growth, but requires true long term vision

Lessons learned from South Korea

- A strong industrialization policy is needed to drive a nation’s growth – South Korea executed this well (despite some resistance from the West)

- Leveraging strong families and group ownership can help to ensure strong entrepreneurial drive in process – but most be openly competitive

- Despite competition, at some point government may become a ”hostage” of the large conglomerates

- The self-interest of the large groups can also prevent the creation of a balanced eco-system with strong SME sector supporting growth and productivity

- Once a nation hits a cul-de-sac, even a massive effort for change into a ”creative economy” may not be enough to change the track – it is better to take this into account from the start
Working together for successful growth!