High Growth Firms of Korea: their strategy and innovation indicators

Seok-Hyeon KIM
Associate Research Fellow
STEPI (Science and Technology Policy Institute)
Seoul, Korea

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Chapter 1. Purpose, Issues, and Concerns

- Purpose:
  - Externally, to identify Korean High Growth Firms;
  - But also internally, to understand business strategies and innovation characteristics of them.

- Old issues:
  (1) [Small and Medium Business] Is there any chance of breakout in the Korean business landscape dominated by large corporation groups called chaebols?
  (2) [Strategic Industrial Targeting and Consequent Deepening of Industries] Can we see, in Korea, the realization of industrial deepening that, Hirschman predicted, will follow after the strategic targeting at assembly-based production?

- New issues: Green and Bio economy
  - Firms ride well on the trend of green-and bio-economy?

- Theoretic Concerns
  (1) [Firm Growth] Features of Growing Firms: size, age, and so on.
  (2) [Innovation] innovation characteristics of fast growing firms
  (3) [Business Strategy] Market and Corporate Strategy

- Why High Growth?
  - High Growth will be a showcase to cross over above issues and concerns.
Chapter 2. Literature Review / policy debates

- Classical Development Economics: Balanced Growth vs. Unbalanced Growth
  - Nurkse, Lewis, and Rosenstein-Rodan suggested balanced growth development models, where ‘balance’ means the coordinated development between lagging industries (e.g., agriculture) and advanced ones (e.g., manufacturing).
  - Hirschman and Rostow, on the other hand, envisioned stage-wise development based on the idea that there are stages at which a certain kinds of sector are best effective in the cost-benefit perspective and so deserve highest priorities in investment. Investment schedules following the priority ranks entails the uneven or unbalanced growth between sectors.
  - Korea, before the Park’s military dictatorship, adopted the former model, but during the Park’s regime, embraced the latter with its arm’s length and steered its well known industrial stages.

- Late Industrialization: Neoclassical vs. Amsden (or World Bank as a in-between-stance)
  - Neoclassical economics emphasizes free economy and Ricardo’s comparative advantage in trade, which may probably lead to light industries loaded with small firms.
  - Alice Amsden, in her monumental work Asia’s Next Giant: South Korea and Late Industrialization (1989), revives Listz’s enfant industry thesis, which results in a high acclamation of Korean Chabols’ role in Korea’s late industrialization.
  - World Bank released a revised understanding of development inspired by Asian Tigers, which is objectively saying a mediocre stance between neoclassical and Amsden but was regarded a shocking departure from the neoclassical – The East Asian Miracle: Economic Growth and Public Policy (1993)
  - However, within Korea, though a minority position, there was the continued voice of objection to the heavy handedness of Korea’s development policy and of benefited chaebols, which would suffocate entrepreneurship and small firms; a represented figure of objection was KIM, Dae-junng, who became the president of Korea amidst of Asian Crisis and pairing IMF austerity measures and enacted a wide range of entrepreneurship encouraging policies.
Chapter 2. Literature Review / theoretic concerns

- Industrial Organization: neoclassical optimal size vs. Gibrat’s law vs. in-between.
  - Viner’s U-shaped cost curve implies that there should be an optimal size of the firm.
  - Gibrat discovered empirically that the growth rates of firms are independent of firms sizes.
  - The 1980s and so on watched a flood of empirical researches on firm growth rates and their explanatory factors; according to them, a firm’s growth rate declines as the size grows but depends on other factors such as its age and its affiliating industry sector, and so on., verifying its dynamic and complicating nature.

- Management and Innovation Study: Corporate strategy, Entrepreneurship, Innovation
  - Particularly since the 1980s,
  - strategy development for corporations became widely popular reflecting the intensified competition; e.g., Porter(1980), *Competitive Strategy: Techniques for Analyzing Industries and Competitors*
  - Studies on entrepreneurship and small business were on a high ride as well; e.g., *Small Business Economics (since 1989)*
  - Schumpeter revived in economics in a domain of evolutionary economics (Nelson and Winter 1982) and his concepts and perspectives on innovation became extended, deepened, modified, and institutionalized (e.g. OECD’s Oslo Manual(1993, 1997, 2005) and its companion survey on Community Innovation.
Chapter 2. Literature Review / Methods

- Firm Growth: Davidsson, Delmar, and Wiklund (2006), *Entrepreneurship and the Growth of Firms*
  - They provide a comprehensive overview of concepts and measurements of firm growth.
  - For example, a chapter by Wiklund reviews growth measurements from many studies, where sales and employment are double pillars.

<table>
<thead>
<tr>
<th>indicators</th>
<th>frequency</th>
<th>share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>turnover/sales)</td>
<td>17</td>
<td>30.9</td>
</tr>
<tr>
<td>employment</td>
<td>16</td>
<td>29.1</td>
</tr>
<tr>
<td>multiple indicators</td>
<td>10</td>
<td>18.2</td>
</tr>
<tr>
<td>performance</td>
<td>7</td>
<td>12.7</td>
</tr>
<tr>
<td>market share</td>
<td>3</td>
<td>5.5</td>
</tr>
<tr>
<td>Assets</td>
<td>1</td>
<td>1.8</td>
</tr>
<tr>
<td>not reported</td>
<td>1</td>
<td>1.8</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
<td>100</td>
</tr>
</tbody>
</table>

- High Growth Firms:
  - Birch (1979, 1981, 1987, 1994 with Medoff) nicknamed high growth firms “gazelles” (successfully popularized) and introduced even higher growth firms as “super gazelles”, which shows roughly an average of 20% annual sales growth for 5 years.
  - Acs, Zoltan J., W. Parsons and Spencer Tracy (2008) define "High-Impact Firms" as two times or more than the average growth rates both in sales and employment.
  - Davidsson and Delmar (2006), Delmar, Davidson, and Gartner (2006) define high growth firms as top 10%, each in terms of absolute employment growth and in at least one of various measures.

Acs, Zoltan J., W. Parsons and Spencer Tracy (2008), "High-Impact Firms: Gazelles Revisited", Small Business Research Summary, No. 328, Small Business Administration of the US.
Chapter 3. Methods

- High Growth Definition:
  - top 100 among the listed manufacturing companies whose 5-year (2004-2009) annual arithmetic average growth rates in sales.
  - growth rates are measured only in organic growth (the year of acquisition is excluded in average calculation)
  - a minimum degree of financial stability is required, e.g. roughly a yearly average of 5% operational profit rate.
  - which lead to the minimum 25% annual growth rate in sales to be top 100.

- Main explanatory factors

<table>
<thead>
<tr>
<th>category</th>
<th>Indicators (from the external DB)</th>
<th>Indicators (from the research’s survey)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributes</td>
<td>age, sector, employment</td>
<td>-</td>
</tr>
<tr>
<td>Market Factors</td>
<td>Exports</td>
<td>Target Market (overseas/domestic), Market Share, Customer Types</td>
</tr>
<tr>
<td>Business Strategy</td>
<td>-</td>
<td>Specialization/Diversification, financing, Core Human Resources Type</td>
</tr>
<tr>
<td>Innovation Factors</td>
<td>R&amp;D Investments</td>
<td>Modes of Innovation, Achievement Levels of Innovation, Partner types of innovation, shares of R&amp;D workers.</td>
</tr>
</tbody>
</table>

- Analysis Methods

<table>
<thead>
<tr>
<th>Stage</th>
<th>Analysis Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Stage</td>
<td>Comparative Analysis of high growth firms and others</td>
</tr>
</tbody>
</table>
<pre><code>                 | (external DB based)                                             |
</code></pre>
<p>| Second Stage        | Comparative Analysis of upper and lower half among high growth firms |
| (external DB + surveyed data)                                   |
| Third Stage         | Highlight of High Growth Firms concerning issues                 |
| (external DB + surveyed data)                                   |</p>
Chapter 4. Main Results / high growth vs. others

Sales and Employment Growth of High Growth Firms in Total

- Total Sales of High growth firms
  - CAGR 25.5%
  - 2003: 19.6, 2008: 61.1
  - Shares of the above (%): 2003: 6.3, 2008: 11.4

- Total employment of High growth firms
  - CAGR 8.0%
  - 2003: 32.7, 2008: 48.0
  - Shares of the above (%): 2003: 5.0, 2008: 6.6

Market: exports’

- Share of exports to sales 2004-2008 annual average
  - high growth
    - <5%: 8.0, 5~<25%: 25.6, 25~<50%: 32.0, 50~<75%: 25.0, 75~: 21.2
  - other
    - <5%: 21.7, 5~<25%: 20.0, 25~<50%: 19.1, 50~<75%: 15.0, 75~: 12.4

Innovation

- R&D Intensity (R&D expenditure to Sales) 2004-2008 average
  - High growth
    - <1%: 32.0, 1~<3%: 42.3, 3~<5%: 18.0, 5%~: 29.6
  - others
    - <1%: 20.0, 1~<3%: 15.5, 3~<5%: 30.0, 5%~: 12.6
Chapter 4. Main Results (2) / high growth vs. others

- attributes of high growth (HG) and other firms by distribution of sales, employment, age, and sector

**Sales (2008) distribution**
- HG: 22.3, 24.0, 18.0, 9.0, 5.0
- etc: 27.0, 21.8, 14.8, 9.0, 9.1

**Employment distribution (2008)**
- HG: 60.0, 55.3
- etc: 25.0, 17.0, 9.0, 6.0, 12.6

**Age Distribution**
- HG: 24.0, 35.0, 22.0, 26.3, 27.2
- etc: 18.2, 20.9, 9.0, 10.0, 9.1

**Sector distribution**
- HG: 0.0, 13.0, 13.0, 31.0, 39.0
- etc: 18.8, 21.4, 9.1, 11.5, 28.7

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**Hot Spot!**
Chapter 4. Main Results (3) / upper vs. lower high growth

**Market**

- **Share in the overseas market**
  - Upper: 22.9, 31.4, 25.6, 17.1, 14.3, 14.3
  - Lower: 23.1, 17.1, 14.3, 14.3

- **Share in the domestic market**
  - Upper: 60.0, 64.1, 20.0, 5.1, 14.3, 14.3
  - Lower: 64.1, 20.0, 5.1, 14.3, 14.3

**Innovation**

- **R&D intensity, 2004-2008 average**
  - Upper: 18.0, 14.0, 22.0, 26.0, 14.0, 18.0
  - Lower: 17.9, 22.0, 26.0, 14.0, 18.0

- **Level of innovation achievement**
  - Upper: 17.1, 17.9, 38.5, 2.9, 2.9, 20.0
  - Lower: 17.9, 38.5, 2.9, 10.3, 20.0
Chapter 4. Main Results (4) / upper vs. lower high growth

Management Decision

- **Corporation strategy**
  - Specialization: upper 57.1%, lower 64.1%  
  - Related diversification: upper 34.3%, lower 33.3%  
  - Unrelated diversification: upper 2.9%, lower 0.0%  
  - Vertical integration: upper 5.7%, lower 2.6%

- **Related Diversification type**
  - Customer-related: upper 33.3%, lower 69.2%  
  - Technology-related: upper 58.3%, lower 30.8%  
  - No answer: upper 8.3%, lower 0.0%

- **Business strategy**
  - Differentiation: niche market: upper 48.6%, lower 41.0%  
  - Differentiation: general market: upper 31.4%, lower 15.4%  
  - Price advantage: niche market: upper 11.4%, lower 25.6%  
  - Price advantage: general market: upper 8.6%, lower 17.9%

- **Financial Sources**
  - Accrued profits: upper 57.1%, lower 69.2%  
  - Direct capital market: upper 25.7%, lower 12.8%  
  - Loan: upper 8.6%, lower 15.4%  
  - No answer: upper 8.6%, lower 2.6%
## Chapter 4. Main Results (4) / upper vs. lower high growth

### Highlight I: Firms of world-class achievement
- either the world market leading share or world-first innovation

<table>
<thead>
<tr>
<th>구분</th>
<th>Firms of world-class achievement (business area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High R&amp;D Intensity (7%~)</td>
<td>Dasa−robot (robotics), Patron (mobile communication equipment), Mirae (LCD equipment), SD (diagnosis kit), Telechips (communication semiconductor), eotechnique (laser equipment)</td>
</tr>
<tr>
<td>Low R&amp;D Intensity (&lt;1%)</td>
<td>Taeung (parts for wind−turbin), TSMtech (titanium tools), pyungsan (parts for wind−turbin), Daehan−metal, Samyung−mtech (steel), Finetech (metal), sunggwangbend (metal), Dong−il−metal, Mkelectronics (bonding wire for semiconductor package), Miju−steel, Hwang−gumST (stainless steel)</td>
</tr>
</tbody>
</table>

### Highlight II: Green Business Firms

<table>
<thead>
<tr>
<th>category</th>
<th>Firms (green business area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind-turbine related</td>
<td>YonghyunBM, Taeung, Pyungsan, Hyunjin-material, Unison</td>
</tr>
<tr>
<td>Solar cell</td>
<td>Jusung-engineering (equipment), Sodif-material (material)</td>
</tr>
<tr>
<td>LED</td>
<td>UriETI (LED BLU), Hwau-tech (LED lighting), technosemicom (equipment),</td>
</tr>
<tr>
<td>Etc</td>
<td>Cecil (biological pest control), NK (CNG fuel tank), Doosan-eng (CO2 capture)</td>
</tr>
</tbody>
</table>

### Highlight III: Biotech &-Pharmacy Firms

<table>
<thead>
<tr>
<th>category</th>
<th>Firms (green business area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy</td>
<td>Daeung,</td>
</tr>
<tr>
<td>Biotech</td>
<td>Chabio&amp;diostech (stem-cell therapy), celltrion (bio-similar)</td>
</tr>
</tbody>
</table>
Chapter 5. Summary and Implications

Summary:

- [Characteristics of High Growth Firms] Roughly saying, Korean high growth firms can be characterized as: small, young, electronics, R&D intensive, innovative, market leading, exports-competitive, specialized, and the electronics sector firms;

- however, there are high growth firms of contrary characteristics: old, low R&D intensity, and metal, though they perform well in innovation and the world market;

- and firms riding on the emerging trend (green or bio) also turn out to be a good performers.

- [Methodology] Even among the high growth firms, the comparison of the upper and lower half repeats that of the whole high growth and other firms. The size of 100 objects is good enough to show the characteristics of high growth firms.

Implication

- While the results confirm the stylized facts about firm growth (small, young, tech-intensive sector as high growth characteristics), they also confirm the un-stylized dynamics underlying high growth (old and low R&D intense, low-tech sector can be high performer); verifying ecological diversity of firms even among high performers.

- Unlike the general perception that only Chaebols are visible in growth and tech-driving, we observe industrial dynamics originating from small firms, which may anticipate further structural change in Korean industries;

- Industrial deepening gets more significant with highly advanced tech-firms (those started as small entrepreneurs);

- Green- and bio-friendly environment provides new opportunities to small firms, spurring industrial dynamics.

-----The End-----