Microeconomics of Competitiveness: Industry Competition and Strategy

Submission of Assignment
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Assignment:

1. Why was Intel initially successful in DRAMs?
   Several conditions could be addressed as Intel key success factors in DRAMs business:
   a. The personal characteristic of Intel executives: strong believers and risk takers;
   b. DRAMs business was a unique industry;
   c. First mover in memory chip business with newest devices;
   d. Strong and advance in product design;
   e. Stay on the leading edge of process technology;
   f. Spent high investment in manufacturing equipment;
   g. Using new production technology that leading costs cutting; and
   h. Applied leadership at product development strategy that put Intel always ahead of competition

2. How did Japanese companies come to become the international leaders in this business? Why couldn’t Intel (or other American companies) recover?
   a. Japanese introduced new products faster that its American competitors, when Intel launched a 16K DRAM, Fujitsu in respond introduced 64K DRAM, higher capacity that fit to market demand;
   b. Japanese also won from its production volume, which led to manufacturing cost advantage;
   c. Key success factor of Japanese strategy was to invest heavily in manufacturing, total of investment in this area was about 40% of sales revenue in new plant and equipment, as compared to only 22% for US firms; and
   d. Most Japanese semiconductors firms (Hitachi, Fujitsu, and NEC) own photolithography, a superior technology (at the time) that available only in Japan. This made most of American DRAM makers were no longer competitive, as such technology made Japan
firms were much faster at developing process technologies and ramping up production capacity.

3. **How did Intel build a competitive advantage in microprocessor? How has the company managed to sustain the advantage over time?**

   Intel built a competitive advantage in microprocessor through several policies:
   a. Intel created innovative design and inventor of semiconductor central processing unit, which then well known as brains for a microcomputer;
   b. Intel 8086 took first-to-market advantage;
   c. Intel through “project CRUSH” won contract to develop first generation PC from IBM, this project was very important since it defined new open architecture standard for both software and hardware components including microprocessor;
   d. Intel applied aggressive marketing strategy against Motorola at all fronts;
   e. Although DRAMs were still considered as technology driver, initiated by some middle level managers, Intel made strategic decision to discontinue the development of 1M DRAM, then exit from DRAMs business, and eventually focus only on microprocessor;
   f. Entrepreneurial culture and independence of middle managers to set strategic direction, both combined with strategic planning that embedded in the organization, resulted in rapid growth and sustain its advantage over time;
   g. Intel applied outsourcing strategy by licensing to 12 companies to produce chips; this strategy made Intel become sole source for the 386 microprocessor to all PC makers except IBM;
   h. In anticipating growth demand from PC industry, Intel changed its internal process, by developing multiple internal sources, several factories and several processes made chips simultaneously;
   i. Intel believes that its innovation and technology deserve premium price from customers;
   j. Intel was successful in dealing with IBM, which played as majority buyer for its microprocessors. In addition, Intel also showed its strength when supporting Compaq as a new PC maker. By supporting Compaq, it opened new market and made IBM aware that not only IBM is strong in PC market;
   k. The emerged of Microsoft opened new opportunity for Intel, as well as strategic partner for further collaboration;
1. Intel was part of some US computer firms that successfully transformed computer market form vertical alignment to a horizontal alignment with open standards, which offer industry more cost-effective;

**In managing resources to sustain its advantage over time, Intel did:**

m. In response to RISC competition, Intel executive successfully resolved the debate by listening to customers, and made decision to stay developing 486-based computers, Intel found out the unwillingness of users to switch to RISC a new architecture that would replace CISC – the key strong factor of Intel;

n. In response to cloning products, Intel developed particular strategy to achieve an overwhelming advantage in performance over its cloning products. To carry out this strategy Intel invested heavily on human resources and new manufacturing technology;

o. In dealing tense relationship with customers, Intel successfully managed “Intel Inside” marketing program, increasing its involvement in sub-system and full-system design and manufacturing, and allocating supplies of new launched chips in the face of tight capacity concern;

p. Intel executives are visionaries and consistence in making leading edge strategy;

q. Intel locked up its market when signed an agreement with Compaq;

r. In dealing with short life cycle of microprocessor, firstly, Intel priced new-generation chips at a premium to limit demand, this certainly give opportunity for Intel to generate more profit at the beginning of new products. When competition stronger, Intel gradually reduce its price. Secondly, Intel allocated supplies among OEMs to balance supply and demand, and using past buying behavior of customers as guide to determine inventory;

s. In dealing with suppliers, firstly Intel applied standardization policy, when realizing this policy created problems, Intel changed to dual-sourcing of critical pieces of production equipment.

4. Why did U.S. companies dominate the microprocessor business from the beginning, with Japan unable to gain a major position?

a. Electronics technology including semiconductors, computers and Internet were born in the US, therefore majority of computer industry standards originated from US rather than from other countries like Japan;

b. Most of US electronic companies allocate significant budget for R&D;

c. Huge domestic market for electronic products using microprocessor as its component;
d. Groups of electronic and semiconductor manufacturing firms create cluster of computer industry at Silicon Valley;

e. Latest research report by Porter (2003) indicates that majority of Japan electronic industry tend to more emphasize on producing electronic appliances (including game toys) which do not need powerful microprocessors, this leads to dependency of Japan PC manufacturer to US microprocessor makers. Although Toshiba, NEC and Fujitsu all make computers, but they use Intel and other US microprocessor products;

f. IBM as the locomotive of the industry, issued outsourcing strategy, which opened new business opportunities for PC vendors like Intel, Motorola, Fairchild and others;

5. What explains the different outcomes in the DRAM and microprocessor industries? What are the lessons for government economic policy?

a. DRAM technology was widely diffused, this made patent were generally not considered effective at blocking entry. On the other hand, although most semiconductor companies drew from common underlying technology bases, nevertheless the application of intellectual property law deserve microprocessors protection, as shown in the case of AMD versus Intel;

b. From competition point of view, Japanese showed its advantage in DRAM process technology, while US players including Intel own leading position in making microprocessors.

To deal with such situation, government could apply economic policies:

a. Continuously and consistently facilitate industry to do R&D;

b. Helping and guiding industry to make products that have comparative advantage to foreign competitors;

c. Facilitate the establishment of industrial clusters that create added value and industry competitiveness;

d. Facilitate the setting of industrial standard and assisting industry to make global such standards; and

e. Provide efficient infrastructures (physical, administrative, information, scientific, technological, natural resources, etc.) that necessary for the industry to grow.

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