Assignment 1
The Rise of Indian Software Industry

EM640
International Engineering Management

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Case Discussion Questions

1. To what extent does the theory of comparative advantage explain the rise of the Indian software industry?

According to Hill [Hill, 2003, p.145], Ricardo’s theory explains that it makes sense for a country to specialize in the production of those goods that it produces most efficiently and to buy the goods that it produces less efficiently from other countries. In the Indian software case, so many educated engineers in India are working in software areas. “They are working for international software company without having to leave their home country” [2003, www.btimes.co.za]. Most of them do their job by online. It can be seen that both countries, India and another country, have a benefit each other. Indian engineers have a job in software industry. On the other hand, another country has a benefit from the Indian cheapest labor. “It is clearly that is could still be mutually beneficial for both country to specialize and trade” [2003, www.systemics.com]. The comparative advantage gives India and another country some benefits, there are no transport costs, the cost are constant, and no tariffs barriers. On the other hand, its can give loss for each country, such as only two country involve, and the goods are identical.

2. To what extent does the Heckscher-Ohlin theory explain the rise of the Indian software industry?

According to Suranovic [Suranovic, 2003, www.internationalecon.com], Heckscher-Ohlin theory predict trade between countries base on the characteristic of the countries and the different resource endowments is the reason that international trade may occur. In the case of India software industry, factor endowment could classified in highly educated engineers, Indian graphical position, English is the working language, and low cost of high skill labors.

Highly educated of engineers in India is required to reach the high quality of software. India has huge number of qualified of engineers. It could be because India has so many institutions which have a world class level.
The Indian graphical position could give more opportunities for India to spread the software industry’s wings to the other countries. Different time zone between India and western countries give Indian more advantage. Such as, the Indian engineers could maintain the software overnight while the system is not used by western country.

English is the working language in India. It could give opportunities for Indian engineers to contacts with western firms easily. According to Business Times [2003, www.btime.co.za], India has a second largest English speaking scientific manpower in the world behind the US. The Indian engineers could work together and make a deal with western firm without any difficulty in language.

Low cost of high skill labors in India could give attraction for other countries to trade with India. “An entry programmer starts at around $5,000 a year” [Hill, 2003, p.168]. This low salary of engineers results in low price of software. Moreover, it could attract the other countries to have a trade with India.

3. Use Michael Porter’s diamond to analyze the rise of the Indian software industry. Does this analyze help explain the rise of this industry?

**Michael Porter’s Diamond:**

Michael Porter explain that the environment in the local firms compete shaped by the attribute promote the creation of competitive advantages. These attributes are factor endowments, demand conditions, relating and supporting industries, and firm strategy, structure, and rivalry. All these attributes are explained in the figure which is called Porter’s Diamond.

- **Factor Endowments**

  Michael Porter in his Porter’s Diamond theory classifies factor endowments in 2 factors, there are basic factor and advance factor. Natural resources, climate, location, and demographical could be classified into basic factor. Moreover, advance factor gives explanation about communication infrastructure, sophisticated and skilled labor, research facilities, and education. According to Hill [Hill, 2003, p.160], basic factor and advance
factor have a complex relationship such as basic factor can provide an initial advantage by investment in advance factor.

India has so many skilled labors with the low cost of its. Although the entry level-programming wage is very low by international standard, they have good skill in this field. Indian software companies are now investing in training programming skill. “There are 73,000 to 85,000 engineers join the software industry every year” [Ikram, 2003, www.india-emb.org.eg]. Most of them are graduated from faculties of engineering and specialists trained in private computer institutes.

- **Demand Conditions**

According to Porter, [2003, www.quickmba.com], when the market for a particular product is larger locally than in foreign market and the local firms give more attentions to that product than do the foreign forms, it leading to a competitive advantage when the local firms begin exporting the product. However, this field is not related to the rise of Indian software industry. The increasing of the Indian software industry is motorized by export. According to Business Times [2003, www.btimes.co.za], the Department of Electronics says that a wing of the Indian government’s Ministry of Telecommunications, Indian software exports increased from $4 million in 1980 to $54 million in 1998 and $1.6 billion last year. It is clearly that the software export gives the best advantages for Indian government.

- **Related and Supporting Industries**

India has a supporting industry of technology which could support the software industry that is the satellite communication. With the satellite communication technology, the business communication between national firms and foreign could be achieve easily and it can be transported fast and negligible cost to any place in the world. Moreover, the software business between India and the other country need a fast dealing in agreement. It is clearly that fast and cheap communication is very important for both countries. The effect of this condition is strengthened when the suppliers themselves are strong global competitors.

On the other hand, there are several poor conditions in India that could not support the software industry such as lowest fixed telephone, and lack of internet connection. India
has the one of the lowest rates for fixed telephone in Asia. Moreover, internet connection in India just 45,000 in 1997, compared to 30 million in US. On the other hand, the mobile phone in India’s main city is growth rapidly for the lack of fixed telephone lines. These conditions are not support the industry of software in India.

- **Firm Strategy, Structure, and Rivalry**

Porter makes 2 points in this section.

Firstly, different nations are characterized by different management ideology, which either help them or do not to build national competitive advantage. Secondly, there is a strong association between local rivalry and the creation and persistence of competitive advantage in an industry [Hill, 2003, p. 161].

However, more local rivalry is better since it puts pressure on firms to innovate and improve. In 1997, there were over 760 software companies in India. It could lead more competition between each company to develop the product. They have to compete to made better software, high qualities, and cheaper cost. The high quality and the lowest price could lead to increasing the customers from the client. “India is trying to increase its exports by maintaining a high quality at a low price” [Ikram, 2003, www.india-emb.org.eg].

4. **Which of the above theories-comparative advantage, Heckscher-Ohlin, or Porter’s-gives the best explanation of the rise of the Indian software industry? Why?**

- **Comparative advantage**

The comparative advantage theory gives explanation of trading between India and another country. The trading can be happen only when India have a weakness in one sector and another country as well. Both countries can fill their weakness with the dealing which is can give a benefit to them. This theory does not define why the Indian software grew. It might be happen, but it takes a long time to achieve it. It could be because only 2 countries involved.

- **Porter’s Diamond**

The Porter’s Diamond theory gives better explanation about the rise of India software industry than comparative advantage theory. However, Porter’s Diamond gives error explanation in demand condition field and supporting industry field. Porter’s Diamond
explains that one part of the diamond is supporting another. Although demand condition and supporting industries in India are poor, it does not effect to the rise of software.

- **Heckscher-Ohlin**

The Heckscher-Ohlin theory gives the best explanation for the rise of Indian software industry. In this theory, all factors which are supporting the rise of Indian software clearly explained. Highly educated engineers, Indian graphical position, English is the working language, and low cost of high skill labors are the most important things that could lead Indian software is rising.

To sum up, although Heckscher-Ohlin theory is suitable for Indian software industry, it is not absolute can used by the other country. It is depend on the ability of the country to improve their technology. Moreover, the ability is based on the infrastructure, labors, and government. These all factors should support the technology in each country.
References:


