Introduction
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PURPOSE OF THE STUDY

Korea experienced remarkable economic development between the years 1962 and 1996. Driven by the twin strategies of Five-Year Plans and export-oriented industrialisation; supported by a literate and hard working male and a substantial number of female workforce; impelled by the zeal of bringing about tangible material changes and enhancing the quality of human life within a generation; and inspired by the mobilising force of developmental nationalism, Korea witnessed a historic leap from one among the many poor agrarian states to one of the very few industrially and technologically advanced nations in Asia.

Korea's economic growth averaged over 8.5 per cent over the period. The per capita GNP rose from US$ 87 in 1962 to US$ 10,543 in 1996 accompanied by an overwhelming increase in exports from US$ 54.8 million to US$ 129.7 million in the respective years. It has emerged as the eleventh largest economy and twelfth largest trading nation.

This impressive performance resulted in the inclusion of Korea in the 'Organisation for Economic Cooperation and Development' (OECD). Following this, the IMF reclassified Korea as an advanced nation. The Human Development Report classifies it as a nation with high human development index.\(^1\) However, the financial crisis of 1997 was an unprecedented setback for the economy that shook the entire nation. But the inherent resilience of its economy, the collective determination of its citizens to face the challenges, and other factors like timely and positive response from the advanced countries.

\(^1\) The human development index is measured taking into account three specific norms for the individual country, i.e., life expectancy, education status and per capita GNP.
international institutions and comprehensive inter-related reforms enabled Korea to tide over the crisis and resume the path of accelerated development.

Beginning with labour-intensive manufacturing products such as textiles and apparels, plywood, foot wears etc. in the early 1960s, Korean industries have rapidly and successfully moved into technology and knowledge intensive products such as semiconductors, telecom equipment, automobiles, etc. The significant changes in the composition of exports are reflected in the increasing share of technology-intensive Korean products in the world market. For example, medium and high technology products together accounted for 67.6 per cent of the total manufactured exports in 2002.²

The success story of Korea has generated a plethora of literature. In fact, most of the pioneering works have viewed Korea as a miracle economy. It has been described by many as a ‘model’ for other developing economies. However, there exist differences among the researchers explaining the factors that have contributed to such an astounding performance.

While, for example, Alwyn Young and Paul Krugman³ have sought to explain the industrial upgrading and success of Korea (in the broader context of East Asia) as nothing but the outcome of low-cost labour inputs and accumulation of capital; others like Sanjay Lall, M. Hobday, Linsu Kim, Ernst and Mytelka have taken the debate to a new level by attributing much of Korea’s success to the accumulation of technological capabilities.⁴ Although studies undertaken by Alice Amsden and the World Bank mostly concentrate on the role of the government and market, they also acknowledge the contribution of technology. For example, the World Bank’s study on ‘East Asian Miracles’ finds

³ Young, Alwyn. “The Tyranny of Numbers: Confronting the Statistical Realities of East Asian Growth Experience”, Quarterly Journal of Economics, (Vol. 110, No.3, 1992), pp. 641-680. P. Krugman, “The Myth of Asia’s Miracles”, Foreign Affairs, (Vol.73, No.6, 1994), pp.62-78. Measuring in terms of total factor productivity growth, these authors argue that the industrial growth of East Asian countries including Korea can be explained by factor accumulation and not by productivity increase. This suggests the application of the neoclassical approach by the authors in their studies.
⁴ The works of these authors are mentioned in the bibliography of this study.
out human capital accumulation (particularly in the case of Korea) as a major factor contributing to their industrial progress. Stated briefly, these authors have argued that Korea’s economic development through export-led industrialisation has been possible because of its rapid assimilation and diffusion of advanced technologies from foreign firms as well as acquisition of domestic capabilities.

The purpose of this study is to move forward the technology-based views by analysing Korea’s industrial pattern and assessing the contribution of technology in its development. In doing so, it has sought to answer the following questions.

What strategies has Korea adopted for industrialisation over the concerned period?

What are the policies pursued by the government for the development of technological capability and how far has it been successful in meeting the demands of the highly diversified industrial structure?

How have the Korean firms acquired, adapted and diffused the imported technologies for industrial production and diversification? What is their success rate in closing the technological gap with advanced countries?

What is the technology intensity of Korea’s exports? How have the Korean firms performed in the international market?

RESEARCH METHODOLOGY

The study is based on the descriptive and analytical approaches. Besides, it examines the available data and statistics on the research theme. It relies on information gathered mainly from books, international journals, working papers and government documents to understand and explain the salient features of economic, industrial and technology development processes. In doing so, it looks into these issues from both local and international perspectives.
As the study aims at assessing the technology intensity of exports, it relies on comprehensive data on Korea's international trade, composition of GDP, R&D structure, other technology related activities and share in world market. It takes the standard classification of industries in terms of technological composition, divides it into three categories such as low, high and medium technology intensive industries and calculates their share in the total exports. But due to certain constraints such as non-availability data, there are some variations in the chapters. These data have been gathered from primary sources such as government’s statistical yearbooks, policy documents and other related statements; UN documents on international trade and development and in some cases from secondary sources like business magazines, newspapers and journals.

To provide in-depth analyses, studies on the technology acquisition process of some particular industrial sectors have been emphasized. Data and additional information for these analyses are obtained primarily through documentary research. Several books and articles published in the form of case studies have also been referred.

STRUCTURE OF THE STUDY

The study is divided into four chapters. Chapter 1 is devoted to the understanding of the theoretical and conceptual dimensions concerning the technology development process in developing countries. It surveys the important literature and discusses the themes of technological change, stages of technological capability building and the influencing factors. The advantages of export-led industrialisation and how such strategy affects the growth performance have also been explained. The purpose of this chapter is to draw important analytical tools for examining the technology development of Korea in conjunction with its industrialisation process.
Chapter 2 presents a detailed description of the industrial and technology development strategy during the phase 1962-1981, which the study considers as the take-off stage. A brief discussion is presented to understand the economic and industrial progress of Korea prior to the initiation of an export-led strategy. The major themes included in this chapter are industrial and technology policy objectives, technology transfer process and accumulation of technological capabilities by firms through learning the techniques of assimilation and minor adaptations. In an attempt to provide an insight, the technology acquisition strategies of two individual sectors, the steel and the consumer electronics have been illustrated. These explanations are supplemented with data analyses of industrial structure and technological composition of the exports over the period. In doing so, it shows the rising concerns of the firms and the government towards creation of a viable technology infrastructure to accelerate exports.

Chapter 3 examines industrial diversification and technological upgrading of the economy since the early 1980s, which is considered as the matured or advanced stage of industrialisation. It explains the economic reform measures, industrial restructuring and policy changes in technology development strategy. Various programmes of the government and the qualitative improvement of the industries through interactive learning and in-house R&D have also been analysed.

Here, the technology accumulation process of the telecom sector (mobile phone) is studied in-depth. As this phase is of critical importance to the study, the technological intensity of exports in seven individual sectors (two each from low and medium and three from high technology intensive) have been examined by calculating their share in total exports over the years. In addition, it also has calculated the comparative advantage index of these industries within Korea. Furthermore, the international competitiveness of the Korean industries has been discussed. In the last part of the chapter, the causes and effects of the financial crisis are examined.
The chaebol have accounted for the bulk of technology-intensive exports and are viewed as the backbone of Korean economy. Chapter 4 makes an assessment of the contribution of the chaebol to the industrial development. Cases of two pioneering firms, Samsung Semiconductor Unit and Hyundai Motors have been studied extensively. It analyses how these firms have consistently focussed on building technological capability for enhancing their quality of products and competing with their counterparts from the industrialised nations. Besides, the government’s role in promoting the chaebol as the engine of growth is also discussed.

The study notes the strengths and weaknesses of the Korean industries over the concerned period and concludes with summarising the findings, streamlining the contents of the chapters and offering suggestions in some pertinent areas that this thesis has examined.