

# The Growth and Productivity of Knowledge-Based Manufacturing in Korea, 1991-99

Kyung –Ae Park, Ph.D.

*Korea National Statistical Office, Service Statistics Division*

*Building III, Government Complex, Dunsan-dong 920*

*Daejeon, Korea*

*Kap@nso.go.kr*

## 1. Introduction

For the development of knowledge-based economy, Korean government has been trying to support 50 knowledge-intensive industries which cover both traditional and new industries. A recent OECD comparative analysis of “knowledge-based industries” has focused on a group consisting of high (and medium high) technology manufacturing plus the services deemed to be the principal users of technology (OECD, 1999). However, limited data availability and the need for international comparability led to the use of very broad groups of services. Meanwhile, KNSO has tried to classify “Korean knowledge-intensive industries” for a better reflection on Korean economy structure. Both OECD and KNSO agree with the classification of manufacturing. To service sector, however, OECD and KNSO disagree and further work has been scheduled. Given limited data availability and reliability of service sector, it is necessary to explore the growth and productivity of knowledge-based manufacturing first in order to meet the growing demand for indicators in knowledge-based economy.

## 2. Methods

Data were collected from The Mining and Manufacturing Survey for the reference years of 1991 to 1999 (KNSO, 1992-2000). The annual survey covered manufacturing establishments in which five and more workers were engaged as of the end of the year. For an analysis, 15 indicators concerning the number of establishments, the number of employees, wages, gross output, census-value-added (CVA), and tangible assets were considered as follows : (1) the proportion and growth rate of absolute values; (2) the values per employee or establishment; (3) the contribution rate to CVA growth of manufacturing; and (4) the ratios of CVA to gross output, CVA to tangible assets, and wages to CVA. For industry classification, this study utilized the OECD classification of “knowledge intensity” (OECD, 2000a), and the OECD definition of ICT manufacturing sector (OECD, 2000b). Major comparisons were made between knowledge-based industries in manufacturing (KI) and other industries, so called, non-knowledge-based manufacturing (NKI) first, and then among sub-classification of KI (ICT, HT, & MHT).

### **3. Findings**

- (1) During 1991-99, the proportion of KI in manufacturing increased from 29.6% to 32.3% for the number of establishments, from 38.2% to 45.3% for the number of employees, from 42.7% to 52.7% for tangible assets, and from 43.2% to 51.6% for gross output and wages.
- (2) For CVA, the proportion of KI increased from 43.0% in 1991 to 53.1% in 1999. The contribution rate of KI to the CVA growth of manufacturing increased from 42.9% in 1992 to 69.0% in 1999 with a peak of 74.3% in 1997.
- (3) KI showed the higher values than NKI every year in the number of employees per establishment, values per employee of wages, gross output, CVA, and tangible assets.
- (4) MHT showed the highest values every year in the number of establishment, the number of employees, wages, wages per employee, gross output, tangible assets, CVA, and the ratio of wages to CVA.
- (5) More specifically, chemicals excluding medicines showed the highest values every year in CVA per employee, tangible assets, and tangible assets per employee, while electronic components, radio, TV & communication equipment showed the highest values in gross output and CVA, and general machinery showed the highest number of establishment.
- (6) HT, especially aircraft, showed the highest values in the number of employees per establishment.
- (7) Annual growth rates did not show regular patterns. KI, however showed higher growth rates than NKI in most indicators on the average, and ICT showed the highest growth rates in nine indicators during 1998-99.

### **4. Conclusion**

Since knowledge-based industries have played a leading role in economic growth and productivity during 1990s, efforts to reinforce the social and economic foundation fitting for a knowledge-based industry should be reinforced. For the Korean society to be further transformed into a knowledge-based economy, however, informatization of traditional industries is a prerequisite, given the high share of non-knowledge-based manufacturing in Korea.

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