

A Comparative Analysis on the Competitiveness of Thin Film Transistor Liquid Crystal Display Industries in Taiwan and South Korea

Topic and Research Question

The display market has experienced several changes over the past decades. For most of the 20th century, the cathode ray tube (CRT) technology dominated the market, however, with the advent of flat panel display technologies, CRTs have almost completely been replaced. Among the various types of flat panel displays, thin film transistor liquid crystal displays (TFT-LCD) became the most popular. TFT-LCD manufacturers are predominantly located across the East Asian Region, with market leaders in Japan, Taiwan, South Korea and China.

Taiwan and South Korea, although being latecomers to the TFT-LCD industry, have witnessed spectacular success and became TFT-LCD market leaders at the turn of the century. Both nations have built a strong background and foundation for developing their TFT-LCD industries.

Competition in the TFT-LCD industry is particularly fierce as it is characterized by economies of scale, a capital-intensive production and high technology thresholds. In order to survive, players must achieve a competitive edge.

The thesis investigates if and how Taiwan and Korea were able to maintain their competitive edge in the TFT-LCD industry over the past decade. In order to analyze Taiwan's and Korea's competitiveness, the research question reads the following:

How competitive are the TFT-LCD industries of Taiwan and South Korea and what are their key success factors?

State of the Art

Over the centuries, many theories of competitiveness have been developed. These range from traditional theories such as Adam Smith's absolute advantage or David Ricardo's comparative advantage to newer theoretical advances including Michael Porter's "diamond model".

Traditional theories have been popular for understanding competitiveness for a long time as they recognized important variables such as factor endowments. However, for many scholars these theories have neglected other important variables, including demand conditions or firm strategies and rivalry.

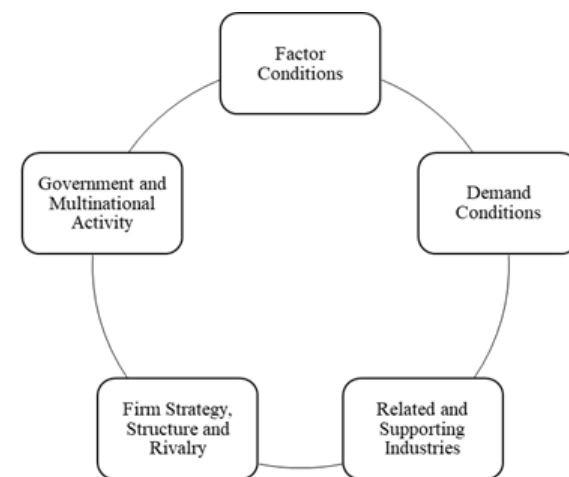
One contemporary work of the competitiveness literature that addresses these shortcomings is Michael Porter's

(1990) "diamond model". The author investigates how nations can gain competitive advantages in a particular industry and offers implications for company strategy and national economies. Porter's model is a more dynamic and comprehensive approach that includes not only factor conditions, but also other important variables.

Yet, his theory is not without criticism. In particular, his view on government and multinational activity has seen considerable disapproval.

Methodology and Approach

The theoretical framework of this study is based on Porter's diamond model but further includes suggestions from other scholars, thereby overcoming the flaws of the diamond model. The model applied in this thesis includes the following five determinants (see figure below).



Source: Author's own compilation based on Porter 1990; Dunning 1993; Rugman and D'Cruz 1993; and Moon et al. 1998

The five determinants are further divided into subcategories. Factor conditions for example comprise human resources, knowledge resources, capital resources, infrastructure and intelligent capital.

Based on these determinants, the competitiveness of the Taiwanese and Korean TFT-LCD industry is compared and analyzed.

Main Facts

The analysis suggests that Korea experienced a strong development in **factor conditions**, especially concerning its knowledge and capital resources, the

infrastructure of TFT-LCD clusters and intelligent capital. The country has a well-established educational infrastructure, which also specializes on display manufacturing and has captured the highest number of TFT-LCD patents over the years. However, Korea is facing a declining labor force as well as high labor costs. Taiwan achieved competitive edge in knowledge resources, capital resources and infrastructure. Nonetheless, the country still struggles in the acquisition of intelligent capital and a shrinking labor pool.

The analysis of **demand conditions** revealed that both economies struggle the most in this category, as both are experiencing a declining market demand in the large and medium to small TFT-LCD panel segment.

While Taiwan and Korea are facing difficulties in demand conditions, they built a strong foundation in **related and supporting industries**. Taiwan and Korea are amongst the most competitive players in the semiconductor industry, and house market leaders such as TSMC and SK Hynix and Samsung. Korea's semiconductor industry chain ranked second globally, followed by Taiwan. Concerning upstream display parts and materials industry, Taiwan captured a market share of 37 percent, outpaced by Korea who seized the highest market share with 42 percent in 2014.

The assessment of **firm strategy, structure and rivalry** disclosed that Taiwanese and Korean TFT-LCD manufacturers have a very different ownership structure. Taiwanese TFT-LCD manufacturers are smaller in size and employ less staff compared to their Korean competitors. Nonetheless, the strategies of Taiwanese and Korean manufacturers are well adapted to the industry's landscape. The degree of rivalry is high for both nations and has contributed to the manufacturer's competitive edge.

Concerning **government and multinational activity**, in both economies, the government played a significant role in the initial growth stage of the TFT-LCD industry. However, the analysis also highlighted that in the past ten years the government has decreased its support. Additionally, while both nations are welcoming FDI, there are still several obstructions, such as Korea's opaque regulatory system and Taiwan's restrictions towards Chinese FDI.

Results

The results of the analysis reveal that Taiwan and Korea have developed a strong TFT-LCD industry over the years and enjoy similar advantageous conditions for

their industry success. Findings display that the main strengths of Taiwan's and Korea's TFT-LCD industry are its factor conditions, related and supporting industries and firm strategy, structure and rivalry. The key success factors of Taiwan and Korea are their skilled workforce, their specialized educational systems and hard infrastructure of industry clusters. Furthermore, spillovers from related semiconductor industries and the increasingly localized display part and material supply industries stimulated TFT-LCD industry growth. In the initial growth stage, Taiwan and Korea also benefited from supportive governmental measures and strategic multinational activities of TFT-LCD manufacturers.

Yet, the comparison further disclosed that both economies struggle most in the category demand conditions, as demand for TFT-LCD panels has decelerated and new entrances such as China increased its market share.

While both countries' TFT-LCD industries are very competitive, they need to adapt to the changes in order to maintain their position.

References

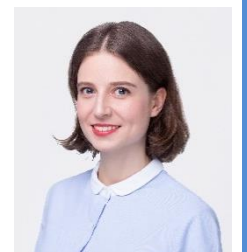
All references can be found in the full version of the MA thesis available at <http://othes.univie.ac.at>

About the Author

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