

# The TFT–LCD industry in Taiwan: competitive advantages and future developments

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## Abstract

Taiwan is one of the world's largest provider of thin film transistor liquid crystal display (TFT–LCD) panels, second only to Korea. In 1998, Taiwan accounted for only 1% of market share worldwide, but by 2002 its market share was over 30%. This study examines the causes behind this amazing growth. There are five major TFT–LCD manufacturers in Taiwan, the largest being AU Optronics Corp. (AUO), which evolved from a 2001 merger between Acer Display Technologies and Unipac Optoelectronics Corp. This case study discusses the benefits obtained from mergers that result in more complete product lines and integrated resources to enhance competitiveness. Porter's Diamond Model is utilized to develop a greater understanding of Taiwan's unique competitive advantages in the global TFT–LCD industry. Then, using the Grey forecasting model, we show that Taiwan's TFT–LCD industry can expect continued growth. The article ends with suggestions for encouraging developing of Taiwan's TFT–LCD industry.

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## 1. Introduction

The semiconductor industry has made great contributions to Taiwan's economic growth in the 1990s, and it is expected that production value for the industry will exceed \$30 billion by 2005. However, growth in the industry is becoming flat. It is expected that

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the next high-production product will come from the thin film transistor liquid crystal display (TFT–LCD) industry.

With numerous successes in the information and semiconductor industry over the past decade, Taiwan has built a strong background and foundation for developing its TFT–LCD industry. However, the initial period for development was filled with challenges, including insufficient talent and technology bottlenecks. The turning point occurred in 1998 when, faced with an intense price war started by Korea and unable to deal with declining profit margins for TFT–LCD panels, Japan decided to transfer its technology to Taiwan. Six Taiwanese companies signed agreements with Japanese companies to implement the technology transfer. After overcoming various technology barriers, the yield rate and production value from Taiwan’s TFT–LCD industry began to increase steadily. At the same time, more manufacturing facilities were developed to improve the economies of scale, thus increasing Taiwan’s worldwide market share for TFT–LCD panels from 1% in 1998 to more than 30% in 2002. However, in 2002 overproduction resulted in a price decrease, and most TFT–LCD manufacturers suffered a declining financial performance.

Competition in the TFT–LCD industry is fierce and not limited to Taiwan. One outcome of the information technology era is simultaneous globalization and localization, sometimes referred to as ‘glocalization’ [1]. Many high-tech products are traded in highly competitive international markets, and such products are developed in industries that are extremely important to their respective strategic national interests [2].

This paper analyzes the TFT–LCD industry environment, with a specific focus on the business strategies of AU Optronics Corp. (AUO), a relatively new corporation that evolved from the merger of Acer Display Technologies and Unipac Optoelectronics Corp. The advantages and disadvantages for Taiwan, Korea, and Japan are compared, followed by proposed methodologies that can strengthen Taiwan’s competitive advantages in the industry. Because of the obvious potential in the TFT–LCD industry, Taiwan should take a more proactive position in this area.

This article is organized as follows: Section 2 describes the current status of Taiwan and the global TFT–LCD industry. Section 3 discusses the background and benefits derived from the AUO merger. Section 4 uses Michael Porter’s Diamond Model [3] to analyze the competitive advantages and disadvantages facing Taiwan. Section 5 offers predictions for the future of Taiwan’s TFT–LCD industry production by utilizing the Grey forecasting model. The article concludes with findings and recommendations.

## **2. Taiwan and the global TFT–LCD industry**

In 1998, six Taiwanese companies were involved in a transfer of technology from Japan, with the goal of developing the TFT–LCD technology. However, a general downturn in global economies contributed to a tremendous loss for all of Taiwan’s TFT–LCD manufacturers. This section discusses the global TFT–LCD industry, Taiwan’s role in the industry, and prospects for the future.

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