

## **Abstract**

Information and communications technology has led to the evolution of production and service business models. In manufacturing process has been developed to the stage of application digital and AI to respond and predict market demand quickly. The petrochemical industry, which has always been regarded as a traditional industry, has also begun to undergo digital transformation. However, the digital transformation of the petrochemical industry may not only have an impact on the overall structure, but may also on the strategies adopted, resulting in a new type of digital collusion. In Taiwan, petrochemical industry invests in artificial intelligence and big data applications has not so popular at this time, there is no anti-competition concern. Once the industry has been familiar with the digital technologies tools, such as use big data and algorithms to exchange data or collaborate build data set by many petrochemical firms, the possibility of collusion could be happened in the future. It is worth noting by competition authorities. The upstream and downstream cooperation of petrochemical industry often uses a Central Satellite Factory System to improve its power on supply chain pricing or raising entry barriers and oppressing competitors, higher than not in central satellite factory systems. If the petrochemical industry central satellite system has violated the vertical restrictions, the competition law should still be applied. In addition, to the petrochemical industry's digital service providers with essential facility elements (such as essential market information), it is worth to examine whether there are transactions refusal or pricing differential. Therefore, this study recommends that competition authorities should pay attention to the advantages with big data gradually, merger evaluation with digital innovation should think outside the traditional box, digital law enforcement requires digital economic departments or digital economic talents, relax the exceptions field for collusion and continue to pay attention to the changes of leading companies' market share in the petrochemical industry.