

## Predicting Foreign Direct Investment of IC Design Firms from Taiwan to East and South China Using Lotka-Volterra Model

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**Abstract :** This work explores the inter-region investment behaviors of integrated circuit (IC) design industry from Taiwan to China using the amount of foreign direct investment (FDI). According to the mutual dependence among different IC design industrial locations, Lotka-Volterra model is utilized to explore the FDI interactions between South and East China. Effects of inter-regional collaborations on FDI flows into China are considered. Evolutions of FDIs into South China for IC design industry significantly inspire the subsequent FDIs into East China, while FDIs into East China for Taiwan's IC design industry significantly hinder the subsequent FDIs into South China. The supply chain along IC industry includes IC design, manufacturing, packing and testing enterprises. IC manufacturing, packaging and testing industries depend on IC design industry to gain advanced business benefits. The FDI amount from Taiwan's IC design industry into East China is the greatest among the four regions: North, East, Mid-West and South China. The FDI amount from Taiwan's IC design industry into South China is the second largest. If IC design houses buy more equipment and bring more capitals in South China, those in East China will have pressure to undertake more FDIs into East China to maintain the leading position advantages of the supply chain in East China. On the other hand, as the FDIs in East China rise, the FDIs in South China will successively decline since capitals have concentrated in East China. Prediction of Lotka-Volterra model in FDI trends is accurate because the industrial interactions between the two regions are included. Finally, this work confirms that the FDI flows cannot reach a stable equilibrium point, so the FDI inflows into East and South China will expand in the future.

**Keywords :** Lotka-Volterra model, foreign direct investment, competitive, Equilibrium analysis

**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020