

# **A Spatio-temporal Industry Dynamic Simulation of Taoyuan Aerotropolis Plan in Taiwan**

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# 1. Introduction



Taoyuan Aerotropolis Plan is an over NT\$500 million investment project to develop the Taiwan Taoyuan International Airport and surrounding area of 6845 hectares that estimates 200-300 thousand jobs and NT\$2.3 trillion NT\$ in revenue. It is also a milestone of industrial restructuring and innovation in Taiwan.



## Research purpose

Our study aims to simulate industry characteristics trend change space and time of Taoyuan Aerotropolis in multiple aspects.



## Vensim model

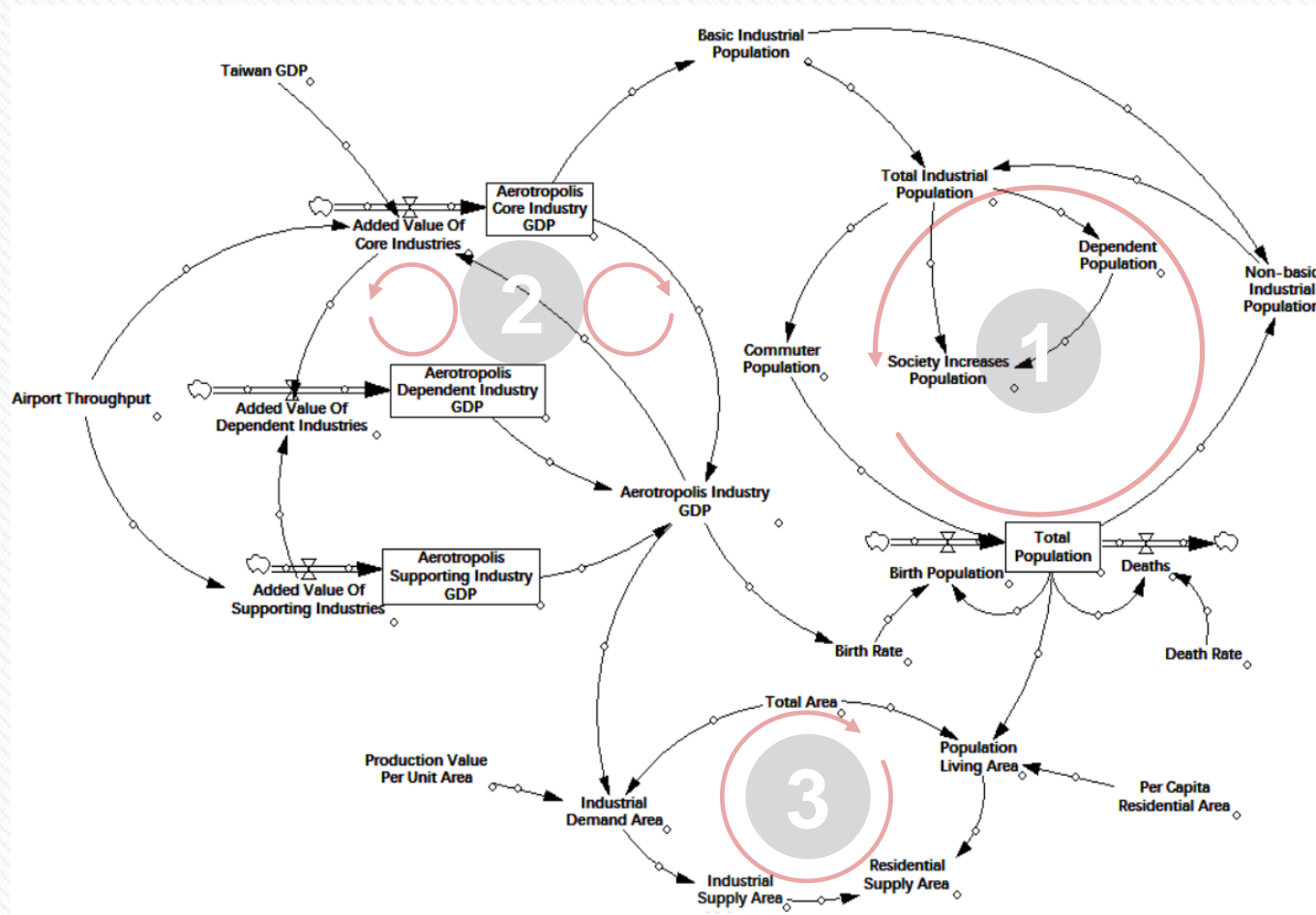
By applying Vensim we demonstrate that the industry system in Taoyuan Aerotropolis would experience a transitional period from growth to maturity while the population system would continue to increase in the first twenty years.



## Netlogo model

In the last part, we simulate of the occupancy of various firms on industrial zone for the next 40 years using an agent-based land use simulator Netlogo.

# 2. Aerotropolis Model



## 1. Population subsystem

Population system includes natural growth population and social growth population

## 2. Industrial subsystem

According to the types of industries that are likely to gather near the airport, the industry is divided into core industry, dependent industry, and supporting industry.

## 3. Land demand subsystem

The land demand subsystem connects the dynamic balance of the population subsystem and the industrial subsystem

# 3. Simulation results

## It is observed that:

When the development and extension speed of industries interact in a positive relationship, the scale of industries is estimated to a steady growth.

When industries' speed of development faster than its speed of extension, the scale of industries is estimated to accelerate.

When industries' speed of development slower than its speed of extension, the scale of industries is estimated to shrink until its extinction.



## Conclusion

Under the characteristics of Aerotropolis transformation rule in industries, the development of industries results in a migration of industries.

In which, industries with higher gross output will be located in the districts with higher geographical advantages, and industries with lower gross output will be dispersed around the city's peripheral areas.

It indicated the inequality of resources distribution, the big always get bigger and the small one getting even smaller.

Moreover, for the supporting industries, a balance status expected to be reached at the critical point of survival in industries, as they have the necessity of existence.



THANKS.

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