# Organizational Growth and Government Control: A Simulation Design

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## Background and Research Question

As Gamson (1975), Ganz (2000), and Spires (2011) has pointed out, the control of an authoritarian government over social organizations can be classified into three categories:

1. Policy on the emergence of organizations (**x**): Penalty imposed or subsidy given to small organizations.

2. Policy on the growth of organizations (**y**): Penalty imposed or subsidy given to all active organizations.

3. Anti-threat policy (**z**): Penalty imposed on large organizations so that they will not challenge the authority of the government.

Therefore, government control can be constructed easily:

**Government Control**

$$Control(P) = zP^2 + yP + x$$

This research aims to estimate the control coefficients and provide a prediction for the growth of nonprofits with different organizational size and subsidy levels.

**Net Asset** is used as a measure of organizational size.

## Method

**Assumptions**

1. Growth: $\Delta P = Income(P) - Cost(P) + Control(P)$

2. Income: $Income(P) = Production(P) \cdot Price(P)$

3. Price: $Price(P) = b - c \cdot Production(P)$

4. Production is linear and random

5. Organizations are grouped by province, and the price in an area is affected by the province's total production.

**Model of Organizational Growth**

The model is given as:

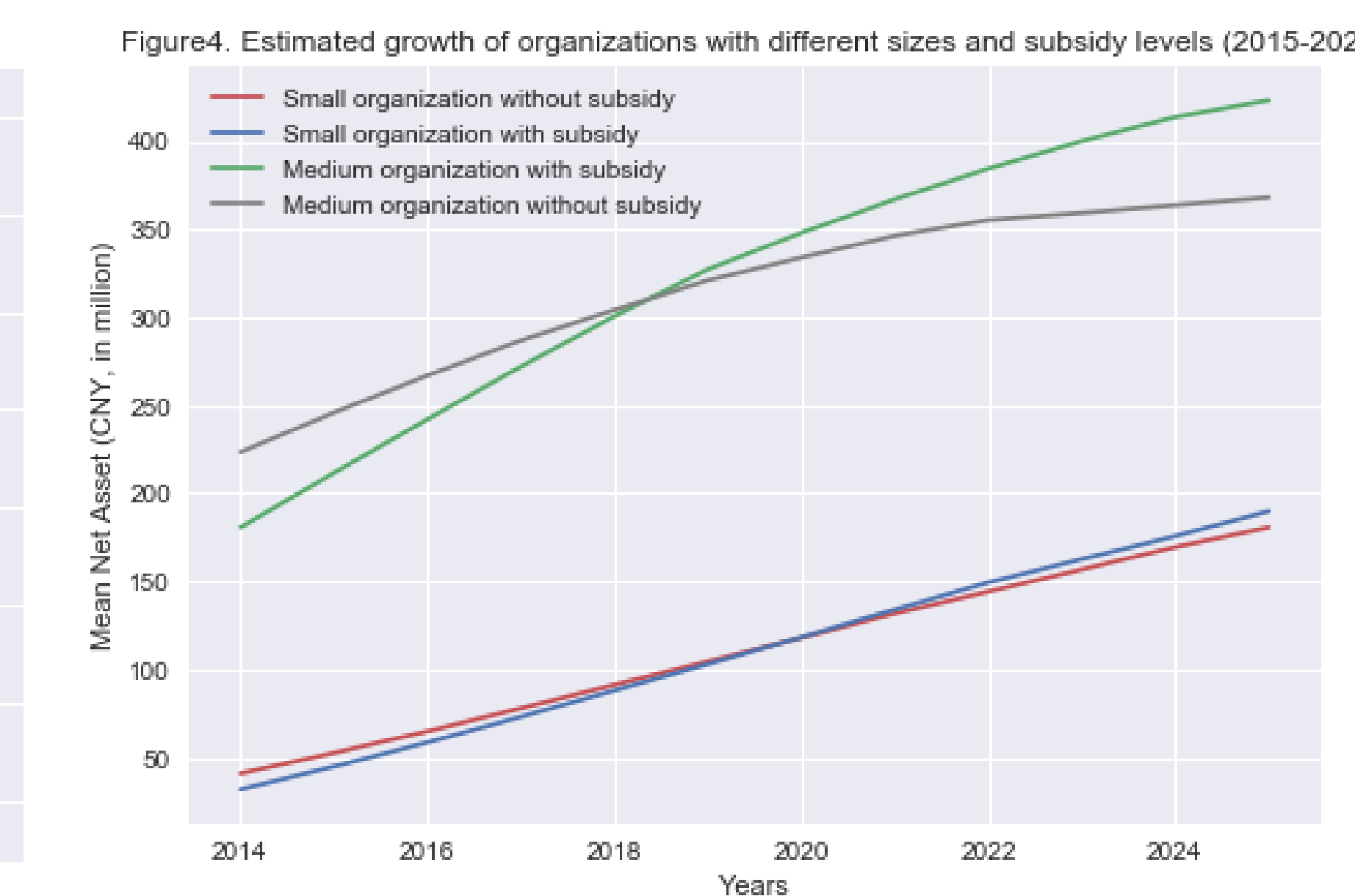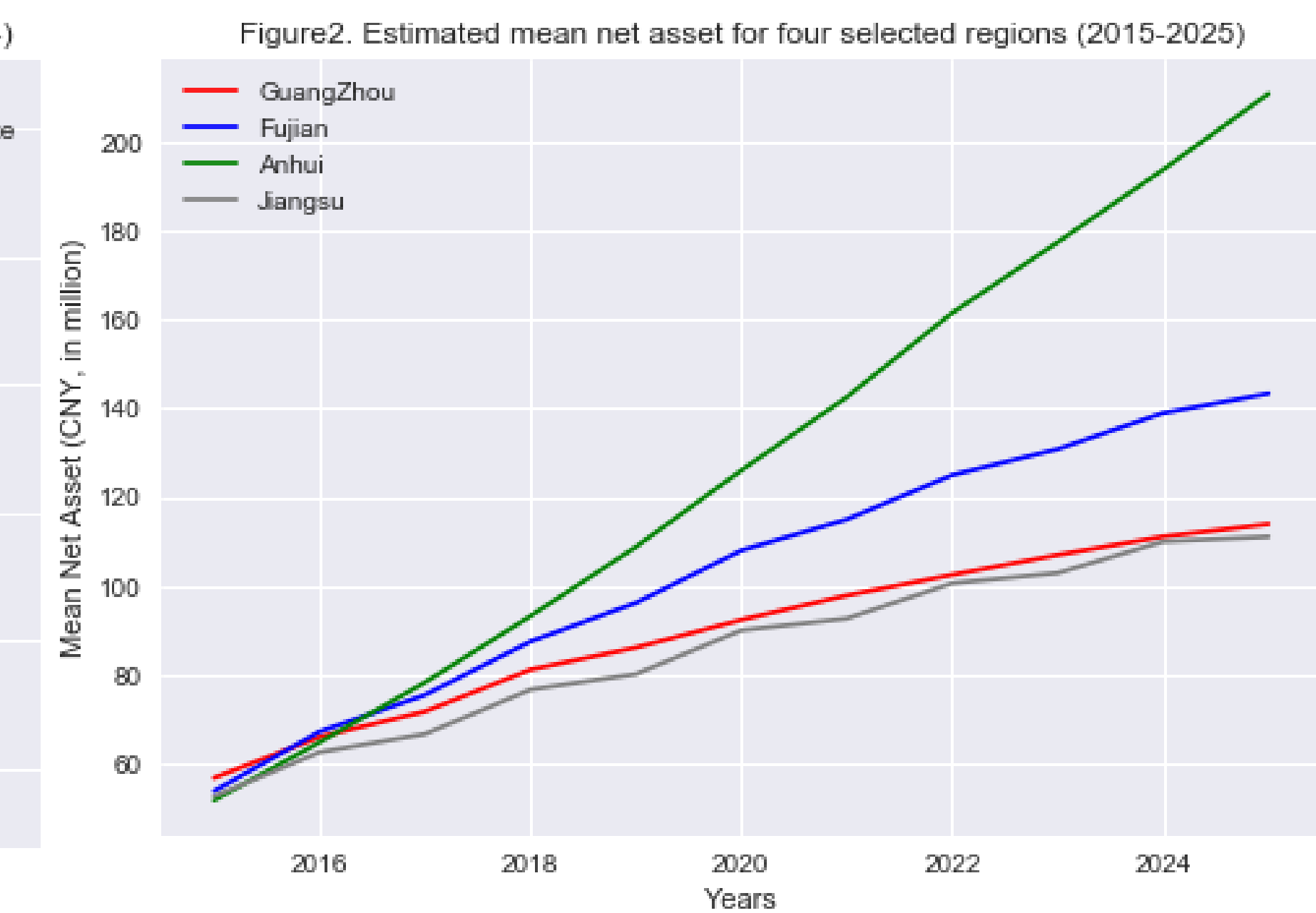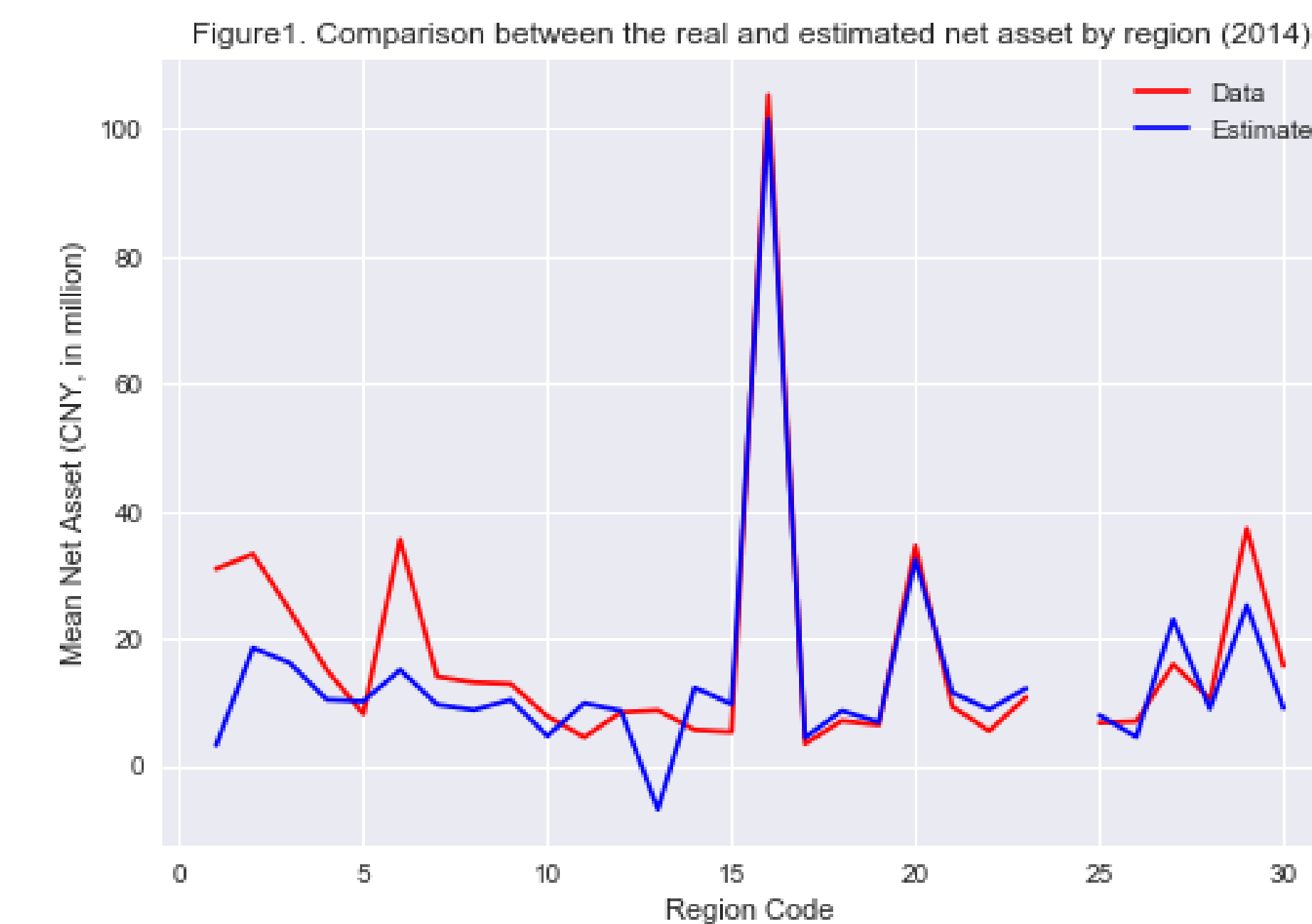$$\Delta P_{i,k} = ca_{i,k}P_{i,k} \sum a_{i,k}P_{i,k} + ba_{i,k}P_{i,k} - cost_{i,k} + Control(P_{i,k})$$

where

- $\Delta P_{i,k}$ is the growth of the $i^{th}$ organization in the $k^{th}$ province.

- $a_{i,k}$ is randomly generated from a $N(0.1, 0.01)$ distribution.

**Parameter Estimation** (Iterations = 100)

OLS is used to estimate the parameters for each of the random vector $a$. Estimation is the mean of the 100 iterations.

## Caliberation and Results



Figure1. Comparison between the real and estimated net asset by region (2014)

Figure2. Estimated mean net asset for four selected regions (2015-2025)

Figure3. Change on Net Asset by Size (a=0.1)

Figure4. Estimated growth of organizations with different sizes and subsidy levels (2015-2025)

## Data

**Source:** Research Infrastructure of Chinese Foundation (RICF). The data are collected from annual reports and audited financial reports published by the supervising government departments. Year 2013-2015 is used.

**Table 1. Descriptive Stats (in millions) (N=7,771)**

| Variables | Mean | Std | Min | Max |
|---|---|---|---|---|
| Net Asset (Constrained) | 57.03 | 119.67 | 1.55e-05 | 972.80 |
| Subsidy Received | 0.29 | 10.33 | 0.00 | 890.20 |
| Cost | 10.87 | 43.41 | 2e-06 | 944.69 |
| Net Asset Change (Constrained) | 5.01 | 29.53 | -287.740 | 477.91 |
| Province | | | | |
| | Total | 7771 | of 30 | categories |
| | Beijing | 961 | | |

## Model Summary

For the logistic equation model, we should have the following constraints:
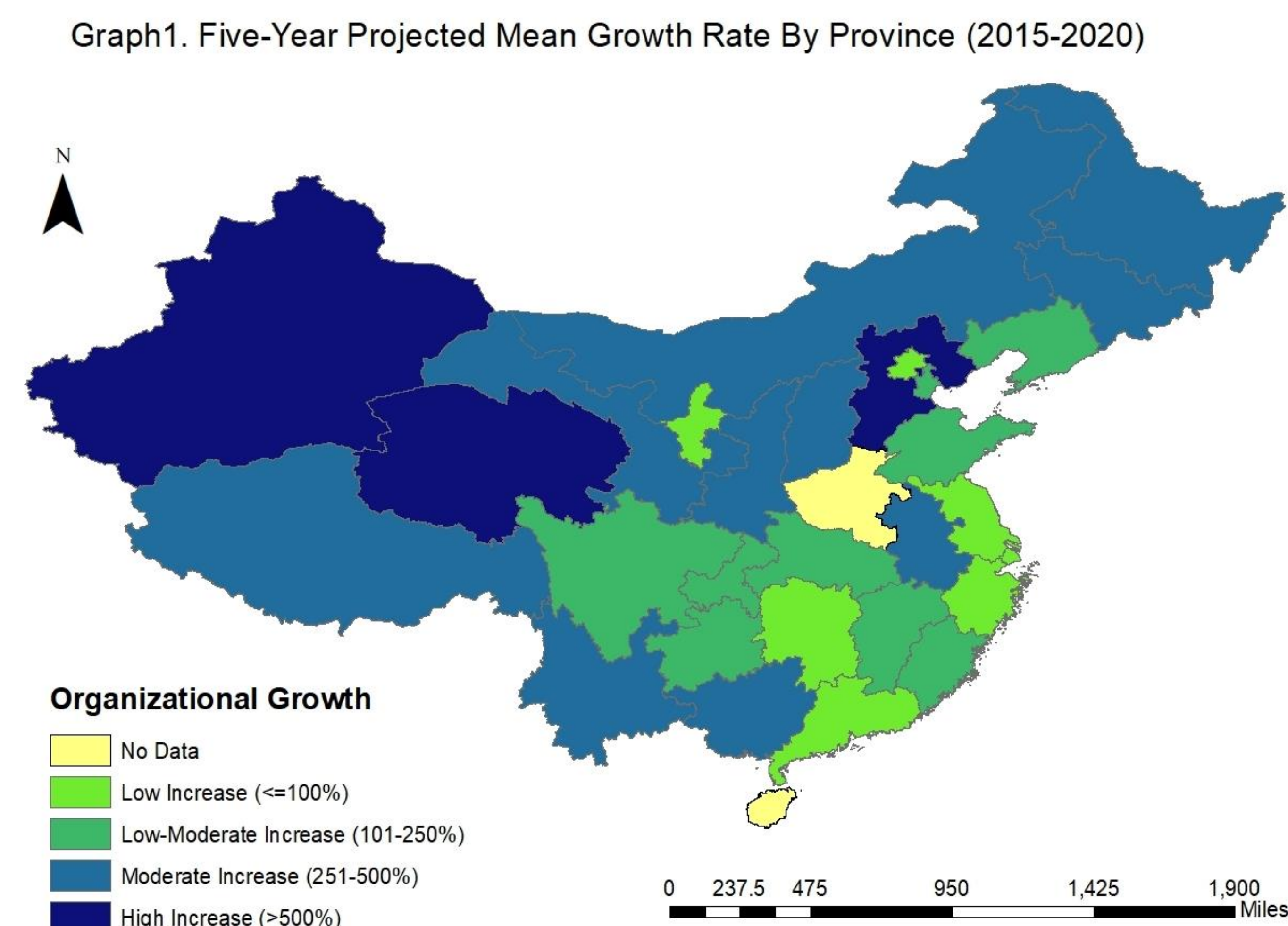
- $z < 0$ and $c < 0$

- $b > 0$

The estimated parameters are given below. The model is valid since we have satisfied the model assumptions.

**Table 2. Parameter Estimation**

| Params | Value | Idea |
|---|---|---|
| z | -0.00153 | Control |
| y | 0.153379 | Control |
| x | 7.886176 | Control |
| c | -0.00234 | Capacity |
| b | 0.680544 | Base Price |

## Forecast: Growth of Nonprofits by Province



Graph1. Five-Year Projected Mean Growth Rate By Province (2015-2020)

**Organizational Growth**

- No Data
- Low Increase (<=100%)
- Low-Moderate Increase (101-250%)
- Moderate Increase (251-500%)
- High Increase (>500%)

## Conclusions

The LE model enables us to detect the duality of government control in China:

- The government subsidizes small and medium organizations

- The government penalizes large organizations

Further, simulation studies enable us to conduct some interesting observations:

- (Fig2) Nonprofits in different provinces tend to have different growth rate.

- (Fig3) Government control will offset the effect of production growth when the size is too large (around 1300).

- (Fig4) Subsidies are important to long run growth for nonprofits.