Organizational Growth and Government Control

A Simulation Study of Nonprofits in China

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Abstract

In this paper, I propose a simulation model of organizational growth, with an emphasis on interorganizational and organization-government exchange. FICA financial data (2013-2015) and OLS is used to construct the model. Simulation results detects a mixed effect of control, indicating the ambivalent governmental attitude towards the nonprofits in China. Regional competition has an effect on average regional growth, but unexpectedly, regional distribution of organizational size also has an effect on average growth. Suggestions are given at the end of the paper to improve the model.

Keywords: Logistic Equation, Government Control, Nonprofit, Competition

Organizational Growth and Government Control

1. Introduction

Witnessed the tragic Tian'anmen Square protests in 1989, where hundreds and thousands of innocent students and civilians lost their lives, many researchers and social movement leaders criticized the state on its totalitarity and called for a more free and open civil society. Yet, the Chinese government, either central or local, seemed unwilling to compromise. Noticing the rising of the third sector, the Chinese Government imposed a series of restrictions on social organizations to prevent political disturbance. The tension between governments and social organizations have since then been an important research topic among political scientists and sociologists.

To cope with the pressure from other countries and international entities, since 2002, the Chinese central government has initiated a democratization process and gradually loosed control over social organizations (Wang & Sun, 2010). However, the Chinese governments tended to have ambivalent attitudes on the democratization process. On one hand, they started assigning more and more public affairs to nonprofits to alleviate administrative costs. On the other hand, they tended to put regulations and restraints on nonprofits to avoid political turbulence. This ambivalence was embodied in a wide range of empirical evidence, where some organizations established productive relationships with the local government, while others conflicted with governmental officials (Fan, 2010).

In this paper, I target analyzing the democratization process in contemporary China. This research focuses more on explaining the control mechanism than offering a

description of ethnography. A simulation model based on logistic equation is purposed in the following sections, and a complete data on foundations in China is used to evaluate this model.

2. Literature Review

2.1 Constructing Organizational Growth

Constructing growth needs a good construct of success. For nonprofits, Chinese researchers propose two metrics of evaluating success: Public service provision and civil engagement (Kang & Han, 2005). In their context, the first is more preferable to the latter, because the government will impose restrictions on the latter to avoid political turbulences (Sun, 2003; Jiang & Zhou, 2011; Wang & Song, 2013).

An expanded definition of organizational success required a multidimensional construct that incorporates the interaction of organization and its environment (Yuchtman & Seashore, 1967; Webb, 1974; Kanter & Brinkerhoff, 1981; Cameron, 1986; Fiorito, Jarley & Delaney, 1995). Galaskiewicz (1985) divides the three fields where organizations interact with the environment: resource securement, legitimacy attainment, political advocacy. First, organizations must secure resources to survive by satisfying its benefactors and beneficiaries (Kanter et al., 1981). Second, organizations must secure legitimacy to initiate activities. Legitimacy incorporates four dimensions: social, political, public, and legal legitimacy, where legal legitimacy is the most important of the four (Gao, 2000). Legal legitimacy not only helps organizations to get enough authority, but also attracts people to engage in its activities (Deng & Wang,

2004; Zhang et al., 2008; Andrews, Ganz, Baggetta, Han & Lim, 2010). Third, at least one dimension of organizational success should pertain to the political lives of citizens (Li, Xiao & Huang, 2012). One goal of nonprofits is to perform collective action and take positions on political issues (Gamson, 1975; Amenta, Carruthers & Zylan, 1992; Amenta, Dunleavy & Bernstein, 1994), and compared with managing the internal affairs, initiating political campaigns tend to have a larger impact (Crutchfield & Grant, 2012).

Combining these three perspectives, the success of organizations should consist of the following three constructs:

a. Survival. No one can be more accurate than Gamson (1975) at showing the resources owned by an organization can determine its survival. Cress and Snow (1996) have further argued that organizational resources include both the "visible" ones (such as money) and the "invisible ones" (such as access to meeting places).

b. Legitimacy. Whether nonprofits can be treated as legal persons. Based on Zhang et al. (2008), legitimacy is a key point in determining if nonprofits organizations can attain public funds from the government and conduct recruiting activities. This legitimacy also grants power to nonprofits and promotes civil citizens to participate in organizational activities (Andrews, Ganz, et. al, 2010).

c. Civil Engagement: This can be defined as whether nonprofit attracts a wide range of people to participate in its activities. This is the key if nonprofit

organizations want to obtain longitudinal and pervasive effects (Crusfield, 2012).

This paper constructs organizational growth as the power to secure more resources from its environment, which falls into the first dimension of the construct of success. This construct focusing on resources embodies the fact the organizational resource is the most important dimension of the three constructs. Almost all the researchers discussing organizations have incorporated it as part of their metrics. Further, it is often easier to give an object operational variable of organizational resources compared with legitimacy and civil engagement.

2.2 Explaining Organizational Growth

Five factors influential to organizational success are identified. These ideas and concepts stem from the five academic branches: Organizational theory (resource mobilization theory), resource dependency theory (**RDT**), political opportunity theory, theory of leadership, and organizational ecology.

Organizational theory argues abundant resources and bureaucratic managerial style increase organizational achievement (Gamson, 1975; Jenkins & Perrow, 1977; Minkoff, 1993; Cress & Snow, 1996, 2000; Haveman, 2007; Andrews et al., 2010). However, too many resources may cause organizations to collapse (Jenkins & Eckert, 1986), and a bureaucratic structure may hinder participation (Pennings, 1976; Goldstone, 1980; Edwards et al., 1995; Ganz, 2000). Recent researchers in China has shown securing a decent amount of resources are important to organizational stability,

since most organizations are suffering from insufficient and undue funds (Yao, 2013).

Despite sufficient funding, the source of funds is also important. **Resource Dependency Theory** emphasizes the limited organizational autonomy when funding sources are homogeneous. Hillman, Withers, and Collins (2009) have pointed out that recourse dependency is likely to increase organizational uncertainty and makes group decisions more conservative.

Theory of collective action argues a favorable political environment is important to organizational survival (Eisinger, 1973; Goldstone, 1980; Amenta et al., 1992, 1994; Giugni, 1998; Meyer, 2004; Greve, Pozner & Rao, 2006), since there are times that political environments are important to the securement of organizational resources (Haines, 1984; Frey, Dietz & Kalof, 1992). For example, some researches in China have pointed out that nonprofits organizations are very likely to achieve their collective goals if they reside in big cities such as Beijing and Nanjing, where there are multiple government layers in those cities (Spires, 2011; Guan, 2013; Huang & Ji, 2014). These organizations can bypass the local group and appeal to the central government directly, and local governments are very likely to compromise for fear of the punishment from the central government.

Leadership also has a deep impact on organizational success (Hammer & Wazeter, 1993; Cress et al., 1996; Ganz, 2000). They exert their influence on building vision, mobilizing members, and mitigating conflicts (Zhang et al., 2008; Niu, 2015). Ganz (2000) puts forward the idea of "strategic capacity" and well-thought framework based on social psychology. In his framework. rich experience, wide connections, and creative

vision of the leaders of the organizations will help organizations to overcome resource shortage and achieve organizational success (Hammer et al., 1993; Ganz, 2000; Reger & Staggenborg, 2006).

Finally, **ecology theories** have contributed heavily to explaining the growth of organizations. The similarities of organizations and biological species, such as pattern of growth and the status of stagnation, make ecological methods appealing to social scientists. Zimm (2005) propose a logistic equation model and theorize organizational growth as the difference of income and costs. This model has many advantages, yet the best part of this model is the assumption that organizations in the same environment will compete with each other, and the growth rate of each organization is dependent on how many resources have already been taken by other organizations.

This research applies a blend of ecological theories, resource mobilization theory, and the theory of political opportunities. As you can observe in the following sections, the model used in this research emphasizes environmental exchange: The interactions between organizations (Ecological theory), and the interaction between the organizations and the government (Political opportunities). Moreover, the growth rate of the organizations is always evaluated by organizational resources (Resource Mobilization).

Tabel1 is presented to compare the ideas and methods of some of the most important research papers in evaluating organizational success and organizational growth. The design of this research is put at the last of the table to offer a comparison.

Table1. Comparison between Recent Researches on Organizational Success

Authors, Year	Paradigm	Key Independent Variable	Method	Data	Key Findings
Gamson, 1975	Resource Mobilization	Organizational Resources	OLS regression	53 social movement organizations in the US	resources are important to organizational success
Ganz, 2000	Social Psychology	Strategic Capacity	Historical Comparative Analysis	unionization of California agriculture, 1959-1966	strategic capacity is more important to resources
Spires, 2011	Political Opportunity	"Fragmented Authority"	Ethnography, Qualitative	Ethnography data on over 200 nonprofits in China	Political environment is important to nonprofits in China
Cress & Snow, 2000	Mixed	Resources, Political environment, Framing	Qualitative Comparative Analysis	Ethnography data in 15 SMOs in 8 cities in the US	Multiple factors and their interactions are important
Andrews, Ganz, et, al., 2010	Mixed	Leadership, Practices, Member engagement	Variations of linear regression	Around 200 original surveys of local Sierra Club	Leadership and internal practices are important to organizational success
Zimm, 2005	Ecological Theory	Organizational Growth	Sinulation (Logistic Equation)	NA	Organizations compete for resources in an environment
Wang, 2018	Mixed	Growth of Organizational Resources	Simulation (Logistic Equation)	FICA (Database of all registered foundations in China)	Government Control has an impact on organizational growth

3. Model Construction

3.1 Government Control

Government control is constructed in a numerical way in this paper. Here I propose the three kinds of effects of control, all of which can be expressed as functions of organizational size **P**.

1. **Emerging** control. The first effect is the impact of policies on small organizations. The government can take two methods on these organizations: They can either support the growth of small organizations or suppress them to prevent potential political disturbances. We may assume this is a constant term, which is an effect on all organizations but is dominant to small organizations. Denote this effect as $\mathbf{x}$.

2. **Growth** control. This is a control which targets all the organizations. For example, the government can charge a tax based on the organizational size, or provide from public funding to help nonprofits to offset their operational costs. In fact, many nonprofits rely on government funds to support their events and staff members, so the estimated effect is likely to help organizations to grow. Since the control is based on organizational size, the control should be a linear term. Denote this effect as $\mathbf{y}$.

3. **Anti-threat** control. Many theorists have argued that there is a control effect of authoritarian states on large organizations. These theorists purpose that the large organizations will have the capacity of initiating political campaigns and calling for structural changes. Apparently, the Chinese government, no matter central or local, are trying their best to avoid such turbulence. Clearly, we may purpose the effect as a quadratic term, and the coefficient should be always negative because the government will impose heavier penalties on organizations with comparatively large sizes. Denote this effect as $\mathbf{z}$ ($\mathbf{z}<0$).

Finally, we will be able to give a model of organization control based on organizational size, and we call it **assumption 1**:

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

3.2 Logistic Equation

This part follows Zimm's (2005) idea to construct a logistic equation based on organizational size. One important assumption of this model is that the growth rate of an organization is dependent on the sizes of other organizations in the environment, which shows the effect of interorganizational exchange. Let's detail the model assumptions and deduce the model using equations.

Assumption 1. Government control is a quadratic function of organizational size, as proposed in the previous section.

Assumption 2. Organizational growth per cycle is a function of organizational size in this cycle. Further, the growth effect can be broken into three parts: Income, cost, and government control.

$$\Delta P = Income(P) - Cost(P) + Control(P)$$

Deduction 2.1. The Income per cycle is the product of production and price.

$$Income(P) = Production(P) \cdot Price(P)$$

Assumption 3. The production per cycle is the product of production rate and organizational size. This assumption implicitly assumes all nonprofits have the same base production rate. It is a fair guess. Nonprofits, unlike tech companies, mainly initiate campaigns and recruit new members based on the amount of resources they can mobilize (banks seldom lend money to nonprofits). Denote the production rate as a.

$$\mathrm{P}roduction(P) = a \cdot P$$

Deduction 3.1. The real production rate is a random variable with its expectation being the base production rate. Let D be some probability distribution and $\tilde{a}$ as its mean, we would have:

$$\mathrm{a} \sim \mathrm{D}(\tilde{a})$$

Assumption 4. The price of a product is linear to the total production in the environment. We assume the products cannot be transported to adjacent environments. It is a fair assumption because the services nonprofits provide are always targeted at the population where the organizations are registered. Donte b as the base price (price with 0 production), and c be the linear coefficient between production and price.

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

Assumption 5 (Competition). The environment contains multiple organizations which all of them contribute to the "pool" of production. The growth rate of an organization is dependent on the size of other organizations in the same environment. Note by assumption 4, the size of an organization in one environment has no impact on the growth rate of other organizations in different environments. Let k denote the kth environment.

$$Price(P_k) = b - c \cdot \sum Production(P_{i,k})$$

Deduction 5.1. Environment are defined as provinces, political units in China. It is a fact that each organization should register in one and only one province in China. Since

there are 30 provinces (excluding Hainan, the island province), we would have 30 environments in our simulation model.

Model

Putting all things together, we would have our simulation model 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.

We will estimate the parameters by drawing the production rate from a probability distribution 100 times and run OLS to estimate the parameters.

Model Constraints

Here is a list of constraints of this model:

1. The cost per population should similar across all the organizations.

2. The base price should be positive (b>0).

3. The linear coefficient of price to number of production should be negative (c<0).

4. The effect of anti-threat control should be negative (z<0).

4. Data

4.1 Data Source and Management

Source

The data of this research comes from the Research Infrastructure of Chinese

Foundation (RICF)[1] (Ma, Wang, Dong & Li, 2017). The databases consist of a complete copy of financial and legal information of all the registered foundations (over 3,000) in China[2]. Besides, the financial data from this database are highly reliable because they are recorded from annual audited reports released by supervising government departments.

The RICF database is updated annually, which meets the need of this research. The collection starts from 2013, and the newest data is from 2015. This paper uses all the data from years 2013-2015. Year 2013-2014 will be used to estimate the parameters, and year 2015 will be used to test the performance of the model.

Data Cleaning

This part gives detailed information on data management and data loss. The source data are *.tsv files, which are later converted into *.csv files. Data are read through pandas.

I input the years 2013-2014, which consists of 6,579 observations from two years. Afterwards, I inspect the five variables “RICF_index”, “Net Asset (Unconstrained)”, “Total Asset”, “Subsidy”, “Cost”, and “Net Asset Change” and drop observations with missing values in any of the five variables. 228 observations are deleted in this process. Next, to comply with model assumptions, I make the further check:

[1] You may find the detailed information on https://github.com/ma-ji/RICF

[2] Unlike social organizations, foundations need large initial funds and legal statuses to operate. Thus it is unlikely to find a unregistered foundation.

1. Check if "Net Asset (Unconstrained)" is above zero, delete the observations with negative values. Unconstrained Net Asset would be used as the dependent variable (organizational size) in this research, by assumption, the sizes of organizations are no lower than 0. This operation may be problematic when dealing with firms, but not so with nonprofits. The fact is hardly would any banks lend money to nonprofits. Further, In China, the law requires nonprofits keep a reserve proportional to nonprofits' total asset, so only a few organizations would have negative net asset.

2. Check the value "Cost" divided by "Total Asset". Drop the observations whose "Cost" are not positive, and the quotient of "Cost" divided by "Total Asset" is larger than 5[3]. This is to comply with **restraint 1** in section 4.2, since our model assumes the cost levels are similar across organizations[4].

Table2. Data Loss during Data Cleaning

Steps	Number of Observations Lost	Number of Observations Kept
Raw Input	0	6579
Drop Observations with Missing Values	228	6351
Drop Abnormal Observations	93	6258
Recode Variables	0	6258
Model Input		6258

The two-step process cost 93 observations. Finally, we get a dataset consists of 6,258 observations.

To confirm with **assumption 5** of this model, I group the organizations based on

[3] Even the value 5 is a quite relaxed cutoff value

[4] The quotient should be similar since the operational cost composition among nonprofits is quite similar.

their registration locations. I now introduce the variable "ba_add", which includes the address of the foundation. For some organizations without addresses, I search through the official website and fill in the table, to prevent further missing observations. The 6,258 are grouped into 31 provinces, two of them have no observations. Further information is listed in **appendix A**.

To deal with pandas DataFrame overflow issues (max storage space is int64[5]), I divide the variables "Net Asset (Unconstrained)", "Total Asset", "Subsidy", "Cost", and "Net Asset Change" by a million (1,000,000) so that overflows are unlikely to occur.

The dependent variable, "Net Asset (Unconstrained)", has been converted to a natural logarithmic version "Net Asset (Unconstrained) - Log". The reason for this operation is the Net Asset is heavily right skewed, and OLS assumes the dependent variable is normal.

4.2 Descriptive Statistics and Operational Definitions

Table3. Descriptive Statistics (Units in Millions) (N=6,258)

Variables	Mean	Std	Min	Max
Unconstrained Net Asset	57.245	121.127	0.000	997.450
Unconstrained Net Asset (Natural Log)	2.628	1.804	-11.078	6.905
Subsidy Received	0.326	11.425	0.000	890.200
Cost	11.495	46.698	0.000	944.695
Net Asset Changed	5.150	29.220	-157.285	477.911
Cost per Net Asset	0.461	0.851	0.000	4.992
Province				
	Beijing	961		
	Others	5297		
	Total	6258		

[5] Pandas still has overflow issues since the largest singed number it can store is 2^63. The problem occurs when I was running regression models and notice some variables turn negative half way through computation

The descriptive statistics are presented in Table3. The table shows that Unconstrained Net Asset is heavily right skewed and the log-transformation effectively changes it to be approximately normal. There may still some normality issues in independent variables but since OLS doesn't assume the normality for independent variables, the model should be safe with the data. The other independent variable "Net Asset Changed" seems to be safely normal, and we do not need any transformations.

All the data used in the dataset are unconstrained asset instead of total/constrained asset used. Constrained assets are the assets the organizations cannot be used until a predefined date. Most endowment and a portion of government funding fall in constrained assets. Unconstrained asset are those organizations can use freely. Unconstrained assets are used in this paper because they correctly reflect the number of resources an organization can mobilize during a cycle (mobilization theory).

The average cost is 10.87. The average cost per total asset is 0.461. The standard deviation is about 0.81 (right-skewed). This shows there are still some variation of cost per asset, but that is mainly caused some outliers that have extremely large costs. The cost level for most organizations are similar.

The net asset change of the organization is 5.01, about one-tenth of the net asset. The standard deviation is slightly more than one-tenth of the net asset. Therefore, it is safe to assume the base production rate of an organization is one-tenth of the organizational size, and the standard deviation is about one-tenth of the organization size, too. That is, we can safely assume that the production rate is from a normal

distribution with mean 0.1 and standard deviation of 0.1. The proposed variance of production rate may seem a little bit small, but in the real case most organizations have positive production rates, and population decrease is usually caused by many other factors (such as competition and control).

Here I introduce the comparison of the choice of base production between Zimm (2005) (which defines the production rate of 1) and this paper (which defines the production rate as 0.1). This comparison may appear to be shocking at first but reasonable after thoughts. The difference lies in the real difference of nonprofits between firms. Nonprofits are unlikely to be as productive as the firms. Firms target producing products and making profits, whereas nonprofits target serving the underprivileged population over population growth. Therefore, it is reasonable that the base production rate is smaller for nonprofits compared with firms.

For other variables used in this model, you can check them in Table4.

Table4. Nominal Constructs and Operational Variables

Construct	Variable	Type
Production Rate	Production Rate	Random
Organizational Change	Change of Net Asset	Numerical
Populational Size	Unconstrained Net Asset	Numerical
Cost	Total Operational Cost	Numerical
Subsidy	Subsidies given by the government	Numerical
Environment	Province in China	Categorical

5. Result

5.1 Estimated Parameters and Calibration

Estimated Parameters

Table5. Parameters Estimated

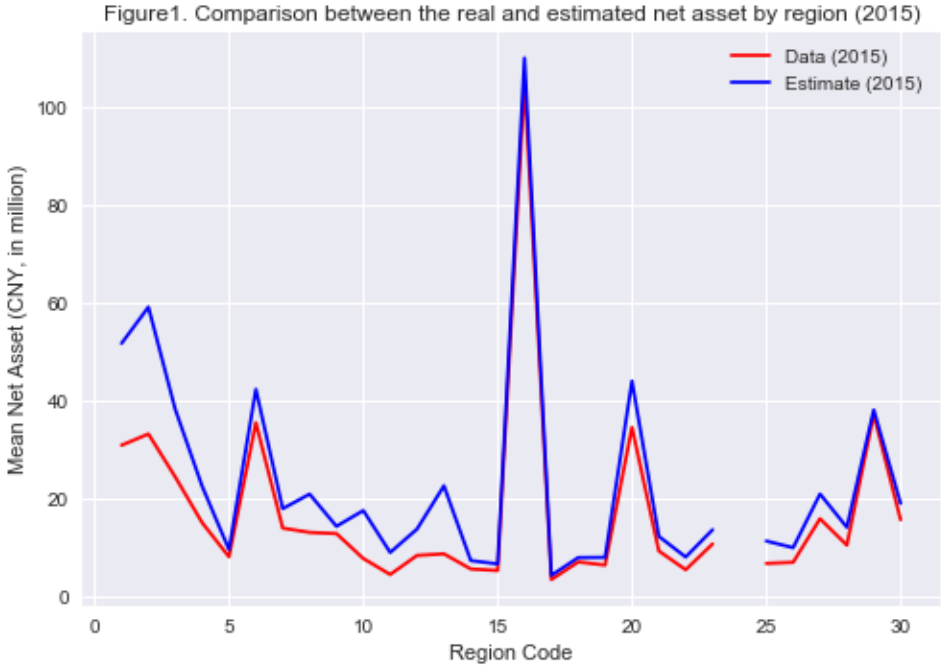
Params	Value	Mapped Construct
z	-0.00015	Anti-threat Control
y	0.148041	Growth Control
x	7.885608	Emergence Control
c	-0.00023	Environment Capacity
b	0.733542	Base Price

Note: Dependent variable is the logarithm of unconstrained net asset.

Table5 shows the parameters we have estimated. All parameters comply with the model constraints (where you can find in section 4.2).

Calibration

Figure1. Comparison between the real and estimated net asset by region (2015)



Here I will briefly discuss how well the model fits data[6]. In Figure 1, I plot the estimated mean net asset by province (blue, from model, 2015) against the real mean net asset by province (red, from data 2015). The X axis is the region code (1-30), and you may need **Appendix A** to read through this graph. The Y axis is the provincial mean net asset (in million CNY).

The graph shows the simulation model yields a good prediction of provincial mean growth overall, including the 16th region (Gansu), which has a very high mean net asset[7]. However, the model yields mediocre prediction in the 1st (Beijing) and 2nd (Shanghai). The failure is unlikely to be caused by mean provincial net asset or number of organizations in provinces alone, since Jiangsu and Shanghai have similar values on the two variables but yields different estimation. This failure may be caused by the heavily skewed distribution of net asset. By the simulation model, many of the small organizations will have increased size if their net asset is small, therefore inflating the mean estimate.

[6] Note that we use 2013-2014 data to estimate the model so that the year 2015 is indeed a test set.

[7] Gansu has many cultural heritages since it is on Silk Road, an ancient network of trade routes connecting the west and east. Gansu has a limited number of foundations, but each of them has a large size.

5.2 Predicted Growth by Provinces

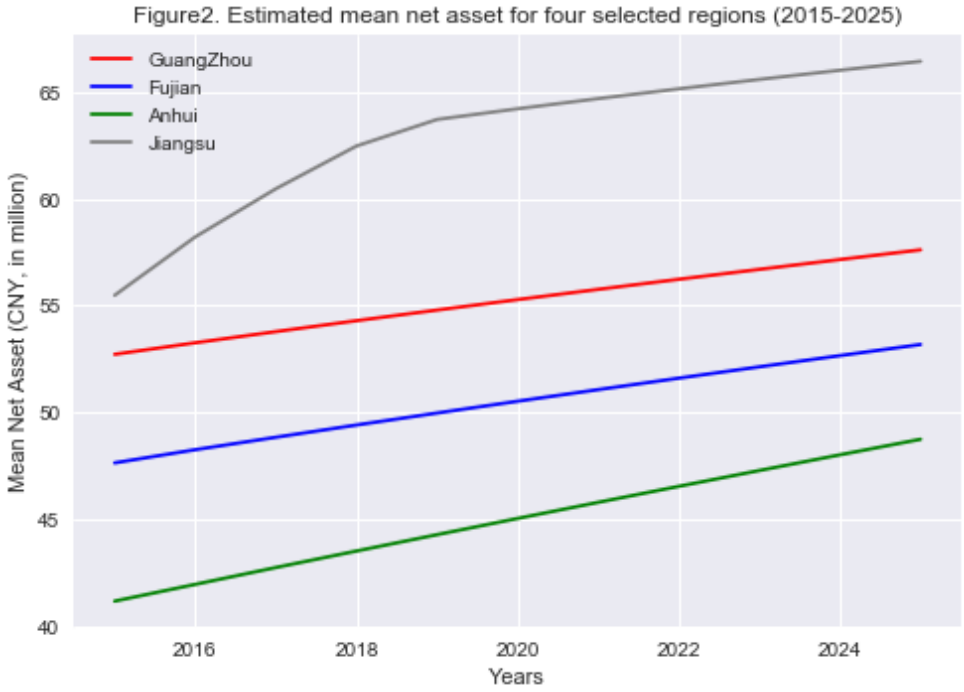
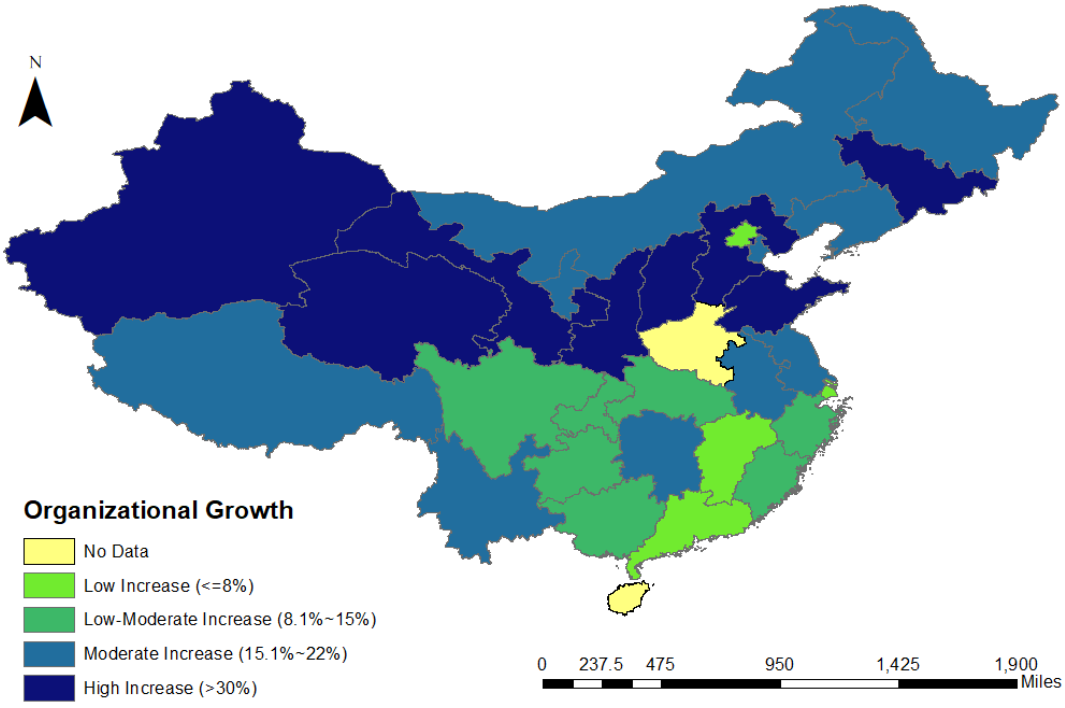


Figure 2 compares the predicted average growth rate of four provinces in China. I used 2014 Data here and make a prediction from 2015 to 2025. The Y axis is years, and the X axis is regional mean net asset. It appears that Jiangsu Province will have the highest growth among the four. For the other three provinces, the growth rates tend to be similar. Anhui, the province with the least initial regional mean net asset, tends to have higher growth rate. Noticing that Anhui only has 171 observations, which is the least among the four regions. This pattern confirms the idea of the model that the less competition, the faster growth rate. But the case of Jiangsu shows that unexpectedly the distribution of organizational size within a region is also important to long term growth.

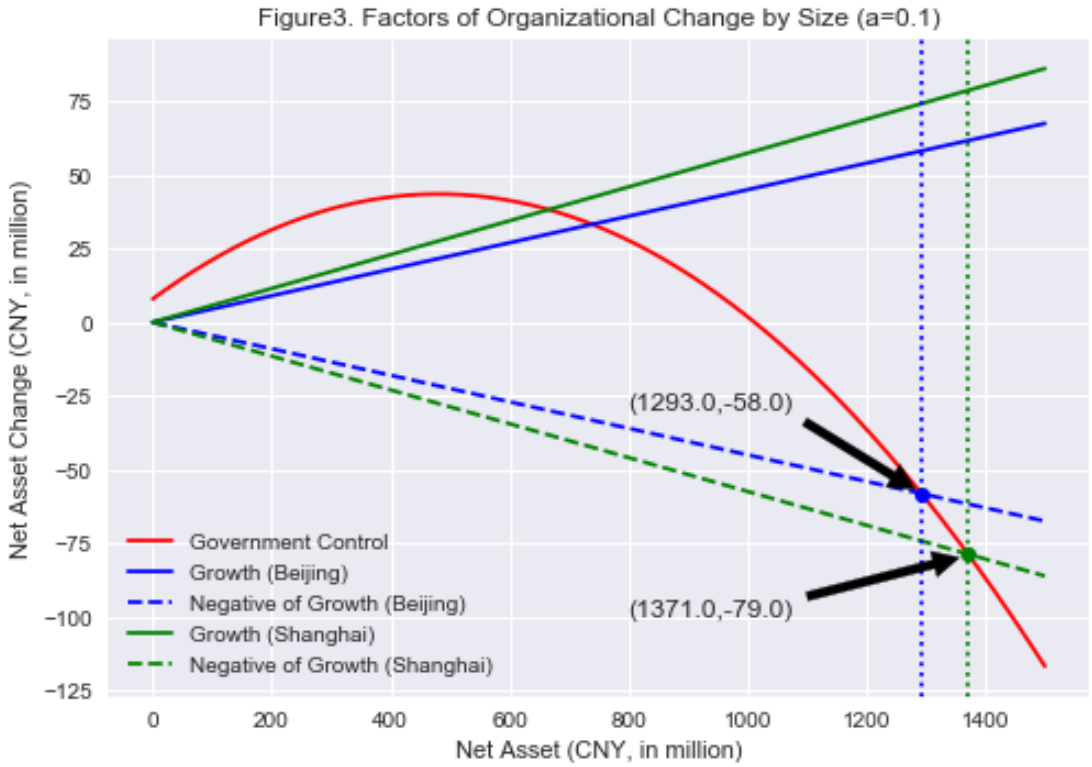
Graph1. Five-Year Projected Mean Growth Rate By Province (2015-2020)



I also make a prediction of the average growth rate for the 29 provinces in China. This graph shows a clear pattern that the average growth rate is heavily geographically distributed, and the southern provinces tend to have lower predicted growth rate compared with the northern provinces. Also, the most developed areas, such as Beijing, Shanghai, and Guangdong, have the least estimated growth rate. This indicates the environment in the economic developed countries are likely to be competitive, or the distribution of organizational size is heavily skewed. Last, the provinces on the same latitude tends to have a high growth rate, even the provinces surrounding the capital, Beijing. This indicates that average organizational growth is not likely to be strongly correlated with economic development, and geographic reasons may play an important role in determining organizational growth. For example, these provinces tend to have large natural resources, and the provinces focus more on exploiting these resources

rather than paying attention to nonprofits.

5.3 Evaluating Government Control



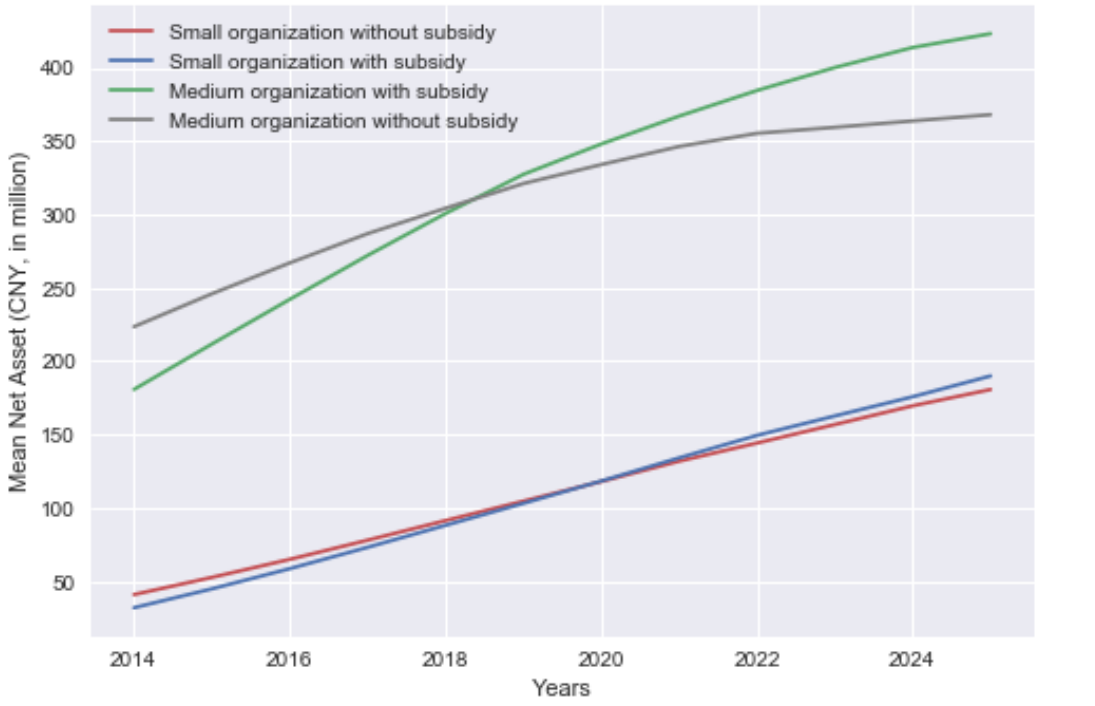
The central idea of this paper is to evaluate government control, and the simulation model enables us a detailed evaluation. The simulation model breaks organizational growth into two parts: Growth by organizational production and growth by government control.

Figure 3 compares these two effects among two provinces of China: Beijing and Shanghai. The X axis is the net asset of the organization, and the Y axis is the net asset change of that organization. The red line represents government control by net asset, and the green and blue are the production growth for an organization in Shanghai and Beijing, respectively.

The graph shows the government is subsidizing the organization if its net asset is no more than 1,010 million CNY. The government quickly imposes penalty on the organization if it has assets above 1,010 million CNY.

I plotted the equilibrium points in two regions. It is clear that since control level is the same across all regions, only the registration province affects the equilibrium. The graph clearly shows that if there is more competition in the province, the equilibrium organizational size tends to be smaller.

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



I also investigate the effect of subsidies on organizational growth. Things would become a bit more complex here because the effects entail both interorganizational exchange and organization-government exchange. In Figure 4, I evaluate the organizational growth for several "coined[8]" organizations with different initial funds

[8] Faked. Not the organizations in the dataset.

and subsidy levels.

The Y axis of Graph 4 is years, and the X axis of Graph 4 is the net asset of the organization. One thing to observe is that the green line has subsidies each turn while the gray line does not, and the blue line has subsidies while the red line has not. This graph effectively shows that government subsidies are more important than initial resource advantages in long-term organizational growth.

6. Conclusion

This paper combines the ideas of resource mobilization theory, ecological theory, and political opportunity theory to construct a simulation model with the following characteristics:

1. Incorporates the interaction between organizations

2. Incorporates the interaction between the organizations and the government

FICA data is used to calibrate the model, and predictions are given. In general, we have discovered the following facts:

1. Regional competitiveness has an effect on organizational growth rate. The higher competitiveness, the less growth rate.

2. The government in China subsidizes small and medium organizations, but penalizes large organizations, indicating the “control” exists that prevents organizations from getting to large to challenge the government.

3. Unexpectedly, the distribution of organizational size of a region has an effect on average regional growth, despite the number of organizations and competitiveness level in that region.

This research has done a very good job in connecting theoretical constructs and numerical computation. A possible enhancement is to modify the expression of the control level so that they are different between regions. This assumption makes sense in that the behaviors of local provincial governments tend to be very different. Different local government, and even different levels of a local government in a region tend to be propose different policies to satisfy their own needs (Spires, 2011; Guan, 2013).

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Appendix A. Coding of Provinces

Table6. Coding and Number of Observations by Province

Region	Translation (Chinese)	Code	Number of Observations
Beijing	北京	1	961
Shanghai	上海	2	429
Guangdong	广东	3	638
Fujian	福建	4	436
Anhui	安徽	5	171
Jiangsu	江苏	6	572
Zhejiang	浙江	7	511
Shandong	山东	8	139
Yunan	云南	9	121
Guangxi	广西	10	66
Guizhou	贵州	11	59
Chongqin	重庆	12	106
Sichuan	四川	13	205
Xizang	西藏	14	15
Qinghai	青海	15	40
Gansu	甘肃	16	42
Ningxia	宁夏	17	70
Xinjiang	新疆	18	41
Neimenggu	内蒙古	19	113
Shanxi	陕西	20	26
Shanxi	山西	21	130
Heibei	河北	22	127
Tianjin	天津	23	125
Henan	河南	24	0
Jilin	吉林	25	106
Liaoning	辽宁	26	135
Heilongjiang	黑龙江	27	120
Hunan	湖南	28	570
Jiangxi	江西	29	25
Hubei	湖北	30	159
Hainan	海南	31	0
Total	-	-	6258