Fiscal decentralization in Taiwan: a case study of the centrally-allotted tax revenue program and local financial accountability

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FISCAL DECENTRALIZATION IN TAIWAN -- A CASE STUDY OF THE CENTRALLY-ALLOTTED TAX REVENUE PROGRAM AND LOCAL FINANCIAL ACCOUNTABILITY

By

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Fiscal Decentralization in Taiwan -- A Case Study of the Centrally-Allotted Tax Revenue Program and Local Financial Accountability

By

Nai-Ling Kuo

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Abstract

Fiscal decentralization has generated enormous interest in the past two decades. Despite some remaining skepticism regarding fiscal decentralization, many countries have adopted various forms in an effort to improve public service quality. The primary objectives of this dissertation are to understand fiscal decentralization in unitary countries, to gain information about the role of the equalization program in local finances, and to investigate local financial accountability issues in a unitary country. Three independent but linked studies were conducted to achieve the above objectives. They employ case studies on Taiwan’s equalization transfer program, the Centrally-Allotted Tax Revenue (CATR) program, and local financial accountability — since a transformation of the CATR program in 2000 from a discretionary to a formula-driven program was referred to as a reform toward fiscal decentralization.

The first study concerns the equalization function of the CATR program. It reviews the current CATR distribution regulations and identifies contemporary issues in it. Findings indicate that the current distribution approach is not transparent or objective enough, the equalization function does not improve by using the current formula-based distribution approach, and the distribution results have low correlations with inter-region’s relative poverty and demand.

The second study focuses on the expenditure impacts of the CATR program. An approach claimed by Nagamine (1995), which considers institutionalized difference between Japan’s and western countries’ local governments is adopted to detect the flypaper effect. An interrupted times-series approach is applied to address the transformation of the program in 2000. Results lend no support to the existence of the
flypaper effect, and the use of formula to allocate CATR funds does not change CATR’s expenditure effect.

The third study provides an evaluation on the current local financial mechanism in Taiwan. Findings suggest that local financial accountability has improved significantly in recent years, yet more efforts are needed to enhance it. Bottom-up accountability is insufficient; the central government is involved in the use of general grants, but may hurt the responsive accountability of local governments; the integrity of internal oversight is not assured; and the quality of external accountability needs to be improved.
Acknowledgements

First and foremost, I would like to thank my dissertation committee, Dr. James W. Fossett, Dr. Yu-Ying Kuo, and Dr. Robert M. Purtell. This dissertation would not have been possible without their steadfast support and disciplined guidance. Dr. Fossett, my advisor and chair, encouraged me to pursue a topic that I was passionate about and would be helpful to my academic career. He taught me the right attitude toward research, he generously shared his own experience with me, and he cared about my future career. Dr. Kuo, a role model and a good researcher and teacher, was like a sister to me. She cared about my research, my life, and my health. Despite the many demands on her time, Dr. Kuo was always ready to listen and I knew I could count on her thoughtful and honest responses. Dr. Purtell, a humorous and open-minded committee member, thank you for carefully reading my work and for those useful suggestions.

I would never forget the help from those Taiwanese governmental officials for sharing their opinions. I thank all of you for taking the time out of your busy schedules to meet with me and for being so forthright about your experiences. I would also like to thank my editor, Miss Barbara Stubblebine, for her time and energy to help me improve my dissertation writing.

I also want to thank some important people who helped in the day-to-day process of this work.

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I have been fortunate to have many lovely friends. Cheng Chen, a friend who offers her support unconditionally, has been a voice of reason and calm. Chao-Yueh Liu made healthy food when I was too busy to cook, drove me to beautiful places when I felt depressed, and found solutions when I felt confused. Leslie Tseng and Larry Liang, my good roommates, they enriched my life in Albany and kept me company. I would like to thank all my new and old friends and roommates for their time, support, and encouragement throughout this journey. Shiau-fang Chao, Man-Chun Chang, Ching-Sheng Lin, Chin-Wen Weng, Lucy Dadayan, Shawn Flanigan, Mounah Abdel Samad, and Xiaoai Ren, thank you so much.

Most importantly, I wish to thank my family and my partner, Wei Cheng.

To my parents: this dissertation is dedicated to you. Were it not for your intense and continual support, faith, love, and coaching, I cannot imagine how I would have completed the coursework and dissertation. Looking back to the summer of 2003, the first time I left my home for the United States, I can still see your tears streaming down at the airport. Six years have gone by, and I hope I have made you proud of me. I thank you for instilling in me the belief that I can reach the goal if I worked hard enough and for giving me the fortitude to persevere. To my brother and his family: your love and caring words can always warm my heart. My cute nephew, Stephen, and niece, Ann, you are my angels. Your smile can always encourage me. To Wei Cheng: you companied me through the toughest days. Thank you for your understanding, for holding my hands tightly over these years, and for always believing that I can make it.

A dissertation is a long journey, but it is not traveled alone.

Nai-Ling Kuo
Chapter One: Overview

Fiscal decentralization, the devolution of fiscal accountability from the central government to lower tiers of governments, has generated enormous interest in the past two decades (Richard M. Bird, Ebel, & Wallich, 1995; Dillinger, 1994; Manor, 1999). Economists often assert that fiscal decentralization responds to local needs more efficiently and accurately than the centralized system (Besley & Coate, 1997; Oates, 1972), while many political scientists argue that the decentralized structure tends to favor particular interest groups and distorts local economies (Crook and Sverrisson, 1999; Smith, 1985). The debates over the efficacy of service delivery capacity under the fiscally decentralized structure have drawn particular attention in developing countries (Bahl & Linn, 1994; Prudhomme, 1995). Despite the skepticism regarding fiscal decentralization, many countries have embarked on various forms in an effort to improve public service quality. Fiscal decentralization is a significant part of their reform to improve local government efficiency and increase economic development (Richard M. Bird & Wallich, 1993).

This dissertation provides an evaluation of fiscal decentralization in Taiwan, focusing on the equalization program, the Centrally-Allotted Tax Revenue program (CATR) and local fiscal accountability. Three relatively independent but associated themes are considered: the effectiveness of the CATR program on regional income redistribution, the fiscal impact of the CATR program on local finances, and the adequacy of the current accountability mechanism on local finances. Fiscal indiscipline in local governments has long been considered a major problem in developing countries (Shah, 2005). The use of intergovernmental transfer is a significant feature of fiscal decentralization in non-federal
countries (Bahl & Linn, 1994). Taiwan has a typically centralized governmental structure, and CATR funds make up nearly 25 percent of Taiwanese local revenue. Therefore, the study of the CATR program is extremely important in understanding the Taiwanese local finances.

The Allotted-Tax Revenue program has been unique and important to Taiwan’s local finances. The central governments collect some portions of local and national tax revenue and redistribute the funds to counties and cities. These funds were termed Provincially-Allotted Tax Revenue (PATR) before 2000, a discretionary transfer scheme governed by the chief of provincial government to subsidize financial shortages in Taiwan’s counties and cities. In 1999, the administrative power of the provincial government was removed, and the national government, the Executive Yuan, became the direct supervision agency of county and city governments. The PATR program was merged with the CATR program in 2000. Before this time, the CATR was merely the allotted tax revenue program between the Executive Yuan, Taipei and Kaohsiung municipalities, and the Taiwan Provincial Government. The distribution of the CATR funds from the Executive Yuan to municipalities and counties (cities) is now under the legal framework built by the Distribution Regulations of the Centrally-Allotted Tax

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1 In this dissertation, Allotted-Tax Revenue program (1), Centrally-Allotted Tax Revenue program (2), and Provincially-Allotted Tax Revenue program (3) are exchangeable. The (1) is the name of this institution. From the perspective of Taiwan’s county (city), they received (3) before 1999 and (2) since 2000. The (3) was emerged to (2) in 2000.

2 Taiwan’s national government is called the “central government”. Before year 2000, county (city) and township also considered the provincial governments a part of central government. In this dissertation, the national government and central government are exchangeable. When it mentions central governments, it means the national and the provincial governments.

3 There are two kinds of city in Taiwan. One is considered at the county level, and the other is considered at the township level. According to Taiwan’s Local Government Act, a city with population between 150,000 and 500,000, popular commercial activities, sufficient own source revenue, and convenient transportation can apply for upgrading to the county level city in the county legislature. The term “city” in this dissertation refers to merely the county level cities. During the studied years (1992-2007), there are five cities in Taiwan being considered in the county level: Hsinchu City, Taichung City, Chiayi City, Keelung City, and Tainan City.
Revenue (hereafter referred to as Distribution Regulations) and managed by the Executive Yuan. The Distribution Regulations include formula and distribution rules that explicitly indicate how the Executive Yuan allocates CATR funds to the lower level governments. The transformation of the CATR program from a discretionary to a formula-based program has been a step toward fiscal decentralization in Taiwan.

**Introduction to Centrally-Allotted Tax Revenue Program**

**Background**

Martial law was imposed on Taiwan from 1949 to 1987 by the Kuomintang (KMT) regime during the Chiang administrations. Under Martial law, the central governments exercised tight control over local administrations and their finances. The law was lifted in 1988, but local governments have run continuous deficits since 1990. Many social scientists have attributed the serious local deficits in the 1990s on Martial law, which allowed excessive fiscal centralism and insufficient local fiscal control. During the 39-year Martial law period, central governments controlled local governments by rewarding or punishing them with more or fewer grants. Local governments were not allowed to collect their own revenue, and local expenditures were mostly financed by higher levels of government. After a long history of dependency on transfers from the central governments, local governments became “timid to collect, [and] eager to spend,” even after the end of Martial law (Lin & Tsai, 2003).

As a unitary country, Taiwan’s local governments relied heavily on resources transferred from the central governments, and many social scientists have claimed that local fiscal autonomy could be enhanced by reforming the intergovernmental transfer
system. Although improving the design of intergovernmental transfer systems alone does not necessarily bring full fiscal autonomy to local governments, it has been recognized that fiscal decentralization usually starts on the expenditure side in unitary countries (Davoodi & Zou, 1998). The centralist model suggests that fiscal decentralization should accompany a well-designed intergovernmental transfer system that limits the central government’s intervention on local decisions.

**1999 Amendment of the Allocation Law of Government Revenues and Expenditures**

Expenditure authorities and revenue obligations are assigned to each level of government in accordance with the *Allocation Law of Government Revenues and Expenditures* (hereafter referred to as *Allocation Law*), enacted in 1951. At the end of 1998, Taiwan’s governmental structure underwent a huge change — the provincial government became a consultant institution, and all of its authorities were taken away. Figure 1 shows the change in Taiwan’s government structure.

After abolishing the provincial government’s administrative power, the responsibilities of counties (cities) were shifted primarily from the provincial government to the county and city governments, while authority for only some taxes were shifted to them (see Table 1). Business sales tax has accounted for nearly 20 percent of total tax collections in Taiwan, and this tax authority shifted upward to the national government instead of down to local governments. The impact of this tax structure will be analyzed in later chapters.

---

4 The concept of the unitary country is contrast to the federal country. A unitary country refers to a country whose sovereign is obtained by the national government, while the lower tiers of governments have its separate functions and responsibilities. The concept of the unitary country is contrast to the federal country.
Due to the structural change of tax authority and the calls for improving local financial authorities, the Allocation Law was completely amended in 1999. The amendment included the rearrangement of tax structures, rebuilding local responsibilities, restructuring the Allotted Tax Revenue (ATR) program, and a stipulation indicating that the distribution of ATR funds was to be transparent and formulated (Article 16). This stipulation led to the enactment of the Distribution Regulations.

The Allotted Tax Revenue Program – A Historical Review

1951-1980

The allotted tax revenue is Taiwan’s unique revenue sharing program. It was first approved by the legislature in 1951 as the Provincial Allotted-Tax Revenue (PATR) to assist local governments’ financial shortages. PATR program was only implemented in the Taiwan Province, although there were two counties, Kingmen and Lianchiang.
### Table 1: Tax Structure Change 1981 - Present

<table>
<thead>
<tr>
<th>1981 - 1999</th>
<th>2000 - Present</th>
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<tbody>
<tr>
<td><strong>National Tax</strong></td>
<td><strong>National Tax</strong></td>
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<tr>
<td>Customs</td>
<td>Customs</td>
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<tr>
<td>Income Tax</td>
<td>Income Tax</td>
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<td>Legacy and Gift Tax</td>
<td>Legacy and Gift Tax</td>
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<td>Excise Tax</td>
<td>Excise Tax</td>
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<td>Securities Transaction Tax</td>
<td>Securities Transaction Tax</td>
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<td>Mining Lot Tax</td>
<td>Mining Lot Tax</td>
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<tr>
<td><strong>Municipal and Provincial Tax</strong></td>
<td><strong>Municipal and Provincial Tax</strong></td>
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<td>Business Sales Tax</td>
<td>Business Sales Tax¹</td>
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<td>Stamp Tax</td>
<td>Tobacco and Alcohol Tax²</td>
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<tr>
<td>Vehicle License Tax</td>
<td>Futures Transactions Tax²</td>
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<td>Selective Excise Tax</td>
<td>Stamp Tax¹</td>
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<tr>
<td><strong>County (City) Tax</strong></td>
<td><strong>County (City) Tax</strong></td>
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<tr>
<td>Agricultural Land Tax</td>
<td>Vehicle License Tax¹</td>
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<td>Land Value Tax</td>
<td>Agricultural Land Tax</td>
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<tr>
<td>Land Value Increment Tax</td>
<td>Land Value Tax</td>
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<tr>
<td>House Tax</td>
<td>Land Value Increment Tax</td>
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<td>Slaughter Tax</td>
<td>House Tax</td>
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<td>Amusement Tax</td>
<td>Amusement Tax</td>
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<td>Deed Tax</td>
<td>Deed Tax</td>
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¹ presents tax authority shifted from the Provincial Government
² presents tax abolished since 1999 amendment of the Allocation Law

Data Source: Fang (2001), rearranged and translated by the author.

added in 1954, which targeted the recipient government to counties (cities) and changed the funding sources of PATR to include national taxes, provincial taxes, and county (city) taxes. Table 2 presents the funding structure of this program.

**1981-1999**

Centrally-Allotted Tax Revenue (CATR) was first enacted in the 1981 amendment of the Allocation Law, which targeted the recipient governments of the Taipei and Kaohsiung municipalities and the Taiwan Province. Meanwhile, counties (cities) and townships received PATR funds, distributed by the provincial government. According to the 1981 amendment, 50 percent of the sales tax and 50 percent of the stamp tax collected by the Taipei and Kaohsiung municipalities were composed of CATR funds. On the other hand, PATR funds were composed of 50 percent of the sales tax, 50 percent of the stamp tax...
Table 2: Funding of Provincially Allotted Tax Revenue, 1951-1980

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<td><strong>National Tax</strong></td>
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<td>Income Tax</td>
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<td>Stamp Tax</td>
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<tr>
<td><strong>Provincial Tax</strong></td>
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<td>Sales Tax</td>
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<td>Land Value Tax</td>
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<td>Land Value Increment</td>
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<td>Tax</td>
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<td>Agricultural Land Tax</td>
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<tr>
<td>Vehicle License Tax</td>
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<td>30</td>
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<td><strong>County (city) Tax</strong></td>
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<tr>
<td>Slaughter Tax</td>
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tax, 20 percent of the land value increment tax, and 10 percent of the slaughter tax, collected by 21 cities (counties).

Unlike allotted tax revenue funding source, which must adhere to regulations, the fund distributions are made by ad hoc decisions. From 1981 to 1998, more than 90 percent of the CATR funds, on average, were distributed to the provincial government; 81 percent of the PATR funds were distributed to 21 counties (cities), and the provincial government held 19 percent as an emergency reserve. Distribution decisions are made by the province governor’s discretionary power. The structure of the allotted-tax revenue program from 1981 to 1998 is presented in Figure 2.

2000 - Present

In 1999, the change of Taiwan’s administrative structure, the local finance stresses, and the calls for stronger local autonomy emerged to force an amendment of the *Allocation Law*. Aside from the shifts of tax authorities among governments, the important changes of the 1999 amendment included: (1) replacing PATR with CATR, and including townships as the CATR recipients; and (2) explicitly stipulating that the
distribution of CATR funds be transparent and regulated. Because of this amendment, the Distribution Regulations were firstly enacted in 1999 and implemented 2000.5

According to the Distribution Regulations, the CATR funds consist of 10 percent of income tax and excise tax, 40 percent of adjusted sales tax,6 20 percent of land value increment tax,7 and the interest earned from this fund. The organization of the national

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5 Here means the fiscal year. Taiwan’s fiscal year used to be July-June, but then rearrange the fiscal year to correspond to the calendar year (January-December).
6 The adjusted sales tax is measured as sales tax deducted from the uniform invoice lottery payments.
7 CATR funds consist of land value increment taxes collected in counties and cities only, municipalities and semi-municipality (Taipei County) are excluded.
government (the Executive Yuan) is responsible for redistributing these funds to municipalities, counties (cities), and townships.

Ninety-four percent of these funds are distributed to local governments in accordance with the *Distribution Regulations* — by ratios to municipality, county (city), and township, and then by formula to jurisdictions within the municipal, the county (city), and the township. This is the “General CATR” — all local governments automatically receive these funds. The Executive Yuan determines the ratio to be allotted to municipalities (43%), counties (cities) (39%) and townships (12%). The Executive Yuan also reserves the right to adjust ratios under the approval of the Legislative Yuan. The distribution ratio was changed once in 2001, but it has been continuous since 1999. Taipei County was upgraded to a semi-municipality in October 2007 and joined the distributable pool of Taipei and Kaohsiung municipalities in 2008. The funding changes and distribution structures are presented in Table 3.

Six percent of the total CATR funds reserved as the “Special CATR” are held by the national government and are distributed by annual appropriation upon applications. The approval or rejection of special CATR application depends on an ad hoc decision. In other words, local governments receive general CATR funds regularly and annually, while they receive special CATR funds only with an approved application.

In the legal framework, the national government is not involved in the local government’s use of general and special CATR funds. The only limit of CATR usage is that it can only support current government activities. Although CATR is considered a local government’s autonomous revenue, the purposes of this fund, as the *Allocation Law*...
indicates, are to (1) close the gap between the local government’s basic needs and resources; and (2) equalize fiscal disparity among regions.

**CATR vs. Grants**

The allotted tax revenue is different from intergovernmental grants in many respects. CATR funds are stable and explicitly regulated in accordance with the *Distribution Regulations*. Intergovernmental grants are financed and distributed through the national government’s annual ad hoc decisions. In the legal framework, CATR funds are local government entitlements, while grants are regarded as a reward from a national government (Kuo, 2008). The distribution of CATR funds is arranged by Taiwan’s Ministry of Finance (MOF), which is the revenue department of the Executive Yuan, but the distribution of grants is arranged by the Directorate-General of Budgeting, Accounting, and Statistics (DGBS), the expenditure department of the Executive Yuan.

The rationale for the CATR program is to minimize the fiscal disparity among regions and to achieve a horizontal balance, and grant programs are to subsidize local needs and to reduce vertical imbalance (Su, 2002). In the perspective of intergovernmental fiscal relations, the CATR program gives local governments the most fiscal autonomy, and the national government works like a distributing organization; in contrast, the grant programs are dominated by the national government, and local governments become affiliated organizations of the national government.

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8 In the context of public finance and intergovernmental relations, the horizontal imbalance refers to fiscal disparities across local jurisdictions, while the vertical imbalance indicates the differences of fiscal capacity between the higher and the lower level governments.
Table 3: The Structure of Centrally-Allotted Tax Revenue, 1999-2008

<table>
<thead>
<tr>
<th>Sources</th>
<th>Distribution</th>
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<td>Special CATR</td>
<td>General CATR</td>
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<td></td>
<td>Municipality</td>
<td>County (City)</td>
<td>Township</td>
<td>Municipality &amp; Semi-Municipality</td>
<td>*</td>
<td>County (City)</td>
<td>Township</td>
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</tr>
<tr>
<td>National Tax</td>
<td>40% of Sales Tax*</td>
<td>10% of Income Tax</td>
<td>10% of Excise Tax</td>
<td>6</td>
<td>47</td>
<td>35</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>County (city) Tax</td>
<td>20% of Land Value Increment Tax of Counties (cities)</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earned Interests of CATR funds</td>
<td>46</td>
<td>41</td>
<td>13</td>
<td>46</td>
<td>41</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

(1) Numbers are in percentage (%)
(2) Data Sources: Distribution Regulations of Centrally-Allotted Tax Revenue, 1998-2007, Ministry of Finance, Taiwan. Table is modified from Kuo (2008).
* The funds for prize of uniform invoice are excluded from the total sales tax used to fund CATR.
** Since October 2007, Taipei County has been upgraded to semi-municipality.

Current Issues of the CATR Program

CATR funds account for nearly 25 percent of municipal and county (city) total revenue, the largest tax revenue of local governments. There have been many arguments in Taiwan about this program since the enactment of the Distribution Regulations. These arguments are in four areas (Hsu, 2002): the insufficient fund pool; the distribution ratios; the non-transparent process of special CATR funds; and the distribution formula. After Taipei County upgraded to a semi-municipality and joined Taipei and Kaohsiung municipalities’ distribution pool, the debates on re-regulating the distribution ratios and reconstructing the distribution formula have become more serious. Moreover, a
jurisdictional readjustment policy has approved by the Legislative Yuan in June 2009 and will occur in October 2010. The readjustment includes the combination-and-upgrade of Taichung County and Taichung City and the of Kaohsiung Municipality and Kaohsiung County. Since year 2011, there will be four municipalities: Taipei Municipality, Taipei County, Taichung Municipality, and Kaohsiung Municipality, in Taiwan. The claim for a reform on the CATR program has aroused a lot interests today. Furthermore, in order to increase the distributable CATR funds, some have suggested that the CATR funds and general grants be combined (Tseng, 2001).

These arguments all stem from the perspectives of local governments. The claims for more money and adopting formulas that favor some specific localities have explicitly political objectives. Very little research has been done on how local governments perform after they have been given more fiscal authority. In addition, there have been very few examinations of the fiscal impact of Taiwan’s movement toward fiscal decentralization.

Statement of Purpose

The purpose of this study is to examine the impact of the 1999 amendment of the Allocation Law, concentrating on the impact of CATR transformation on local finances and financial accountability. This dissertation attempts to provide an evaluation of the current CATR program and local fiscal accountability for policymakers to consider for future improvements. The Ma Administration began in May 2008 and the readjustment of local jurisdictions will cause debate over the rearrangement of CATR fund distribution of. An evaluation of the current program is necessary for future policy recommendations.

In addition, this dissertation is expected to provide information on policy implications to non-federal countries about the relationship between fiscal decentralization and
intergovernmental transfer systems. Bahl and Linn (1992) argue that a negotiable grant involving political bargaining is an obstacle to fiscal decentralization, while a formula-driven grant is more helpful. This study provides empirical evidence for their arguments.

**Research Questions**

The framework of this dissertation is presented in Figure 3. There are three sets of research questions. Each concerns a specific theme, as stated previously. The general questions and sub-questions that are used to operationalize the main research questions are presented as the following:

**Figure 3: Framework of the Dissertation**

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9 Please see the literature section of this proposal for their detailed taxonomy of grant systems.
Research Question One: Redistributive Effect (Equalization)

The essential merit of a formula-based transfer program is that it reduces political interventions in the process of allocating transfer funds. This issue is addressed as the following:

Research Question 1: Do CATR funds target poorer regions, i.e., does the use of a distribution formula improve fiscal balance compared to the discretionary distribution made through political negotiations?

The rationale for Taiwan’s CATR program is to address financial shortages in local jurisdictions and minimize regionally fiscal disparities among them. However, during the period when Martial law was imposed on Taiwan, the distribution of allotted-tax revenue did not have an objective and transparent process, and therefore the program became a means for the provincial government to control local administrations. In 1999, the CATR distribution transferred from a discretionary system to a formula-based one. The first empirical question asked here is:

Research Question 1a: How does the current CATR program operate?

Theoretically, one of the essential merits of adopting the formula-based transfer system is to reduce negotiations and lobbying activities in the legislative and/or executive agencies (Louis, Jabine, & Gerstein, 2003). Worthington and Dollery (1998) found empirical evidence that states with greater “political capital”\(^{10}\) receive greater non-formula based transfers. Ma (1997) also indicates that formula-driven transfers should bring higher distributive efficiency than discretionary transfers, i.e., they are more likely to reproduce equalization results. This research question is followed by sub-questions:

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\(^{10}\) Political capital refers to the power of a person of organization to influence policies. According to Jacobs (2007), having political capitals means having “the ability to influence naysayers, engage state and federal agencies in projects, discover new funding sources, and possess the leverage to get things done”.

Research Question 1b: Does the formula-drive CATR reduce fiscal disparity more than the discretionary transfer?

A formula-driven transfer system does not necessarily lead to redistribution, since political factors may also mediate the distribution result (Khemani, 2004). The third question should also be addressed to evaluate the current distribution formula:

Research Question 1c: Does the current distribution formula take demand and poverty into consideration?

Research Question Two: Expenditure Impacts

Current Taiwanese literature on the CATR program mainly focuses on how to expand the divisible pool of CATR funds and how to allocate funds to the neediest. By contrast, very little attention has been paid to how local governments spend the money they receive. The equivalence theorem developed by Bradford and Oates (1971) indicates that the increase of grant money has the same spending effect as the increase of private income. However, empirical findings have concluded that lump-sum intergovernmental transfers essentially have stronger stimulus effects on public spending than private income. This anomaly has been referred to as the “flypaper effect.” Gutiérrez (2005) attributes the flypaper effect of the Mexican revenue-sharing program to the insufficient own-source revenue in the Mexican local governments.

In the context of the Taiwanese CATR program, since the distribution of CATR funds depends heavily on the differences between local basic needs and local basic revenue,\textsuperscript{11} local governments may expand their spending in order to gain more funds for the next

\textsuperscript{11} The CATR distribution formula is composed of two elements: 85% of the distribution is determined by the shortage of local governments to finance their basic needs, including personnel and infrastructure expenses, and 15% of the divisible fund is determined by their business income.
fiscal year (Liu, 2002). Traditional fiscal federalism literature argues that this type of transfer program creates incentives for local government to reduce their own sources, to overspend, and as a result, to induce the presence of the flypaper effect. Therefore, it is important to understand how local governments treat the CATR funds they receive. Specifically, since there are some empirical findings that lend support to Oates’ (1985) hypothesis that fiscal decentralization is associated with bigger governments (Chen, 2004; Faguet, 2004; Forbes & Zampelli, 1989; Kwon, 2003; Sagbas, Sen, & Kar, 2005), the change of expenditure impacts between discretionary CATR and formula-based CATR programs is of great interest. The main research question raised here is:

Research Question 2: How do local governments respond to the received CATR funds? In particular, does the Taiwanese CATR program lead to the appearance of the flypaper effect on local spending, and does the distribution formula enhance this effect or weaken it?

**Research Question Three: Accountability**

Current literature indicates that local accountability is hard to achieve in unitary countries (Litvack, Ahmad, & Bird, 1998; J. A. Rodden, 2002; Seabright, 1996; Wade, 1997). The main reason for this is that monitoring and auditing are more intense in national governments than in local governments (Brueckner, 2000; Tabellini, 2000; Tanzi, 1996). Further, intergovernmental transfer is an integral part of the fiscal decentralization in unitary countries, but Khemani (2007) argues that the over-dependency of local governments on intergovernmental transfers undermines local accountability. Therefore, a closer look at the accountability system is an important part of the evaluation of fiscal decentralization in unitary countries.
Putting this issue into the Taiwanese context, Su (2002) has indicated that the financial accountability of local governments is relatively overlooked. Current Taiwanese literature has very little discussion about local financial accountability. This study addresses this insufficiency and asks:

Research Question 3: Is the current accountability mechanism adequate to secure local financial accountability in Taiwan?

The current accountability mechanism will be evaluated based on the criteria of financial transparency. The indicators used for the evaluation purpose are four general standards of fiscal transparency developed by the International Monetary Fund (IMF), which will be discussed in the literature review section. This research question will be operationalized by examining if the accountability mechanism of the CATR program corresponds to the standards presented in Appendix 1. Those standards follow four indicators of the 2007 IMF Code of Good Practice on Financial Transparency and the 2001 OECD Best Practices for Budget Transparency and are applicable to the Taiwanese CATR program.

The CATR program is different from other grants in Taiwan or in other countries, because there is no overleaping responsibility between central and local governments in the arrangement of CATR receives. The national government is merely responsible for redistributing funds to local jurisdictions based on the Distribution Regulations, and local governments take the full responsibility for the use of received funds. Although the accountability principal and agent is clearly distinguished, it is not possible to hold local governments responsible specifically for CATR usages. The primarily reason is there is

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12 Su (2002) suggests the examination of Taiwan’s locally financial accountability to be accordant with “Code of Good Practices on Fiscal Transparency” provided by the IMF and “OECD Best Practices for Budget Transparency” provided by OECD.
not a separate account for CATR receipts and uses in the budgetary documents. CATR receipts are considered local general funds as a tax revenue, and thus it is not easy to distinguish the fund from other general fund and to evaluate its efficiency and effectiveness individually. In other words, the evaluation of local general funds on their accountability is actually the evaluation on the CATR fund. In this chapter, the evaluation target is set as local general funds.

A Brief Review of the Taiwanese Literature on the Three Themes

The current studies of Taiwan’s local finances mainly focus on how the national government can assist local governments to relieve their fiscal stresses. For example, Huang (2002) indicated that the only way to relieve local financial stress is to enlarge the divisible pool of CATR. In addition, there have been many examinations of the distribution and the distribution formula of CATR funds (Chao, 2002; J.-H. Hsu, 2002; Sun, 2002; Tsai & Lin, 2006), and all suggest more appropriate distributions that could target the money to poorer regions. Some studies investigate the relationship between the CATR program and local fiscal discipline. For example, Lin and Tsai (2003) argue that the fiscal discipline in the local governments can be improved by institutional changes. Lin and Tsai’s perspective is reinforced by Huang and Guo (2007), who also suggest local governments expand their tax capacity. Pan, Liu, & Wu (2004) adopted the empirical model conducted by von-Hagen & Hepp (2000) to examine the equalizing impacts of three Taiwanese transfer systems. Specifically, they categorize Taiwanese counties (cities) into eastern, central, northern, and southern regions. Their findings indicate that the three transfer systems have different impacts on risk sharing and income redistribution, and that these impacts differ from region to region. For example, the CATR program can
slightly lessen tax revenue disparities in the northern and eastern regions, while the tax revenue disparities in the central region worsen (J. H. Hsu, 2005).

The accountability issue is relatively overlooked in the current literature. Although Hsu (2005) provides an overview of the accountability mechanism of Taiwan’s public sector, there is no specific mention of financial accountability at the lower level. Wu (2001) surveyed 25 counties (cities) to explore local officials’ attitudes toward information disclosure. Su (2002) calls for a transparent information system of the CATR program. She proposed three approaches to financial transparency in local governments of Taiwan: 1) the role and responsibilities of local governments should be clarified; 2) local financial data should be publicly accessible; and 3) an independent external auditing system should be established. Her recommendations follow the Code of Good Practices on Fiscal Transparency by the International Monetary Fund (IMF) and Best Practices for Budget Transparency by OECD.

Except for the above-mentioned studies, very little attention has been paid to local financial performance in Taiwan. No comprehensive investigation into the impact of the 1999 amendment of the Allocation Law on local finances has been conducted. This paper aims to complement the current literature by providing a broad and detailed evaluation of the local financial accountability mechanism.

**Significance of the Dissertation**

In a general terminology, this dissertation is expected to make an empirical contribution to the literature on fiscal decentralization in unitary countries. In particular, it is expected to offer two important insights into the current literature about the role of
intergovernmental transfers in fiscal decentralization: one related to the current state of fiscal decentralization in unitary countries, and one related to the ongoing policy debates about the CATR program in Taiwan.

First, this study contributes to the current literature by investigating fiscal decentralization in unitary countries. More and more countries have decentralized their fiscal systems to improve the efficacy of public sectors. Accordingly, most conceptual, normative, and empirical literature focuses on the economic or financial outcomes of these devolution movements, especially in the developing and OECD countries. However, a further empirical investigation of the role of equalizing transfer systems in these countries is in short supply.\textsuperscript{13} This dissertation provides an understanding of the Taiwanese CATR program from two independent but related dimensions: regionally fiscal disparities and fiscal impacts.

In addition, from the policy perspective, current Taiwanese studies of the CATR programs focus on the insufficiency of the divisible pool and distribution formula, mostly from the local government’s perspective. That is, most of the studies are concerned merely with how the national government assists local governments, rather than the how local governments perform in response to new responsibilities (T. T. Su, 2002). Although local financial shortages is an issue in Taiwan, the lack of knowledge of local government performance may lead to serious problems due to inefficient public service delivery and potential corruption. This dissertation attempts to offer further understanding about the extent of Taiwan’s local financial accountability and the current CATR program from a broader scope, and the results of this study can assist policymakers in making informed

\textsuperscript{13} Montinola, Qian, and Weingast (1995) and Jin, Qian, and Weingast (2005) are exceptions since these studies provide detailed investigation of the Chinese type of fiscal federalism.
decisions about the improvement of this transfer program and local accountability mechanisms.

**Organization of the Dissertation**

The organization of the rest of this dissertation is as the following:

Chapter Two reviews current literature on the three topics. Both theoretical arguments and empirical findings are systemically presented to guide readers through current issues and understandings of the three topics. It first reviews literature on the relationship between fiscal decentralization and intergovernmental transfers, followed by specific issues on equalization programs, expenditure effects of intergovernmental transfers, and accountability issues.

Chapter Three outlines the approaches this dissertation has taken to find answers for the research questions. Multiple methods were employed to examine each research question. The first question was answered through reviews of laws and regulations, quantitative data analyses, and semi-structured interviews with local division of finance officials. The second research question was answered through adopting a modified expenditure model developed by Nagamine (1995), supplemented by unstructured interviews with local division of finance officials. The third research questions was answered through reviews of laws, regulations, official reports, and governmental websites, and through semi-structured interviews with officials from local divisions of budget, accounting, and statistics, divisions of finance, and audit offices.

Chapters Four-Six are devoted to findings and analyses of each topic:
Research Question 1: Do CATR funds target the poorer regions i.e., does the use of a distribution formula improve fiscal balance, compared to the discretionary distributions made through political negotiations?

Research Question 1a: How does the current CATR program operate?

Research Question 1b: Does the formula-driven CATR reduce fiscal disparity more than the discretionary transfer?

Research Question 1c: Does the current distribution formula take demand and poverty into consideration?

Research Question 2: How do local governments respond to the received CATR funds? In particular, does the Taiwanese CATR program lead to the appearance of the flypaper effect on local spending, and does the distribution formula enhance this effect or weaken it?

Research Question 3: Is the current accountability mechanism adequate to secure local financial accountability in the Taiwan?

Chapter Four presents research results in accordance with the first research question. Chapter Five presents findings corresponding to the second research question, and Chapter Six shows findings related to the third research question. Each chapter not only presents research results, but also presents further analyses of each topic.

Finally, Chapter Seven offers a synthesis of findings, conclusive remarks, implications, and policy recommendations, as well as the limitations of this dissertation and potential directions for future research.
Chapter Two: Literature Review

The literature section consists of theoretical arguments about the rationale for decentralizing fiscal systems, as well as the problems associated with implementing fiscal decentralization with intergovernmental transfers, including fiscal disparities, expenditure impacts and accountability issues, and empirical evidence for current debates on these issues. In practice, fiscal decentralization requires all tiers of governments to have the authority to make policy decisions about service delivery. It also requires adequate revenue for governments to carry out these programs. The major portion of local revenue comes from self-raised taxes and intergovernmental transfers from higher levels of government. Intergovernmental transfers are a major part of local revenue for developing and developed unitary countries, therefore the following literature reviews will focus on the relationships between intergovernmental transfers and the above-mentioned three issues.

Fiscal Decentralization and Intergovernmental Transfers

The Theory of Intergovernmental Transfers

There are two theoretical foundations for intergovernmental transfers. One of them is from the model of efficiency and equalization. This model assumes governments are purely benevolent, who use intergovernmental transfers as a policy tool to achieve regional equalization and economic efficiency (Oates, 1972). An equalization transfer program is preferred, and its principle is to assist local governments to provide comparable levels of public services corresponding to the taxation.
The other competing theory is derived from the public choice model, which assumes governments act like selfish politicians, who merely seek to maximize their utility. Intergovernmental transfers are a tool for politicians to gain greater political capital (Alperovich, 1984; Faith, 1979; Grossman, 1994; Leyden, 1992; Rich, 1989). From this perspective, an equalization transfer is not always preferred, since politicians might have no gain from providing such a program.

**Fiscal Decentralization and the Role Intergovernmental Transfers**

The forms and degrees of fiscal decentralization differ among countries based on culture, history, and governmental structure. Bird and Vaillancourt (1998) identify three levels of fiscal decentralization made by local governments – deconcentration, delegation, and devolution. *Deconcentration* is the weakest form of decentralization, where a task is transferred from the national government to a local government rather than empowering the local government. *Delegation* can be explained as a “mild” transfer of decision-making authority, where the national government maintains essential power over which tasks should be delegated, and the local governments are accountable for the outcomes of the delegated tasks. Current fiscal decentralization reforms usually refer to *devolution*, which means the local government has full decision-making authority and takes full responsibility for the outcomes.

Devolution of fiscal authority involves revenue raising and expenditure authority. In most federal countries, devolution usually means that local governments have authority for both revenues and expenditures. In unitary and/or developing countries, however, devolution usually implies the decentralizing of expenditure power, accompanied by intergovernmental transfers (Bahl & Linn, 1994; Bardhan & Mookherjee, 2006; Dillinger,
This is because a significant portion of local governments in unitary countries do not have sufficient resources to maintain a standard level of public service. Intergovernmental transfers provide a rapid and economically acceptable approach to deal with the differences in revenue-raising abilities and expenditure responsibilities in some jurisdictions in these countries (Bardhan & Mookherjee, 2006). Bahl and Linn (1994) specified that “a system of grants is a step toward fiscal decentralization in that it finances local government services,” but they also indicated that “the degree of autonomy it gives local governments in making their budget decisions depends on the structure of the grant system” (p. 6). The different types of grant systems will be introduced in the following section.

**Typology of Intergovernmental Transfers and Local Autonomy**

The types of intergovernmental transfer programs used determine the degree of autonomy a local government can obtain when they use intergovernmental transfers to fill the gap between available revenue and expenditure needs. The two types of intergovernmental transfers are conditional and unconditional.

*Conditional transfers* refer to a grant where the national government specifies the purpose, category, or function for which the recipient can use the money. This type of grant is usually used for a program that is considered highly important to the national government, but is relatively less important to the local government recipient (Ma, 1997). Conditional transfers can be further classified into open-ended matching grants, closed-ended matching grants, and non-matching grants. *Open-ended matching grants* require the recipient to contribute a fixed percent of the total expenditure on the specific program/function, and the national government supplements the rest of the expenditure.
need. The more the recipient spends on the program, the greater the subsidization it receives. *Close-ended matching grants* are similar to open-ended matching grants, but there is a ceiling for the cost that can be reimbursed by the national government. This kind of grant is used as a budget control mechanism in some countries (Ma, 1997). *Non-matching grants* requires no cost-sharing from the recipient government, and the national government grants a fixed amount of money for specific program/functional spending. In the context of fiscal decentralization, the use of conditional grants is closer to delegation than devolution, since the recipient does not have full authority over spending decisions.

*Unconditional transfers* are lump-sum amounts, sometimes referred to as revenue sharing. In an unconditional transfer, the grantor government transfers a fixed amount of money to the recipient and places no restriction on its usage. This type of transfer is often used to reduce regional fiscal disparities and to secure that a minimum level of public service is provided at the local level. In some countries, these are known as vertical transfers, where money is transferred from the central to the local government, such as in Australia, Canada, Japan, and Korea. In other countries, equalization transfer systems shift resources from richer regions to poorer regions at the same governmental level. This is an unconditional horizontal transfer, where the national government merely redistributes the funds collected either by local governments or by the national government. Germany’s transfer program is an example. Unconditional transfers are allocated to local governments either on a discretionary basis or a formula basis.

*Discretionary transfers* allocate funds based on the central agency’s discretion or ad hoc decisions. *Formula-based transfers* allocate funds based on an objective formula, with variables that reflect the purpose of the transfer program. In the context of fiscal
Table 4: Bahl-Linn Taxonomy of Grant Systems

<table>
<thead>
<tr>
<th>Method of Allocating the Divisible Pool among Eligible Units</th>
<th>Methods of Determining the Total Divisible Pool</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Specific share of national or state government tax</td>
</tr>
<tr>
<td>Origin of collection of the tax</td>
<td>A</td>
</tr>
<tr>
<td>Formula</td>
<td>B</td>
</tr>
<tr>
<td>Total or partial reimbursement of costs</td>
<td>C</td>
</tr>
<tr>
<td>Ad hoc</td>
<td>D</td>
</tr>
</tbody>
</table>


decentralization, unconditional transfers give local governments full power over spending decisions and could be used as a tool of devolution.

Intergovernmental transfers also may be classified by the determination of a divisible pool and by the forms the distribution approaches (Bahl & Linn, 1992). The Bahl-Linn taxonomy of grant systems is presented in Table 4.

Among those grant systems listed in the table, C, G, and K represent matching grants, while the type A grant is the pure shared tax that allows no negotiation on the allocation of funds. Type B and D grants are the most common forms of unconditional general purpose grants. These two grant systems differ in the level of power of the national government over the allocation of transfers. The type B grant system, the formula-based grant, can limit the intervention of the national government on allocating funds (this kind of grant system is used in Brazil, India, and Nigeria), while the type D grant, the discretionary grant, reserves power for the national government to vary fund allocations. This kind of grant system is used in South Korea. (Bahl, 1999).
Intergovernmental Transfers and Equalization

Regionally Fiscal Disparity – Theoretical Perspective

Equity is one of the major objectives of governments. Despite more countries implementing fiscal decentralization to improve public service delivery, it has been noted that fiscal decentralization may be harmful to interregional equity (Prud'homme, 1995; Tanzi, 1996). It is a political reality that developing and/or unitary countries encounter more serious problem of interregional fiscal disparities than industrial and/or federal countries, especially in the fiscal decentralization process (Prud'homme, 1995). Attempts by local governments to redistribute interpersonal income have often failed due to the Tiebout sorting mechanism, 14 which groups people by level of financial ability (Krugman, 1987; Myrdal, 1957). Some evidence suggests that interregional income redistribution can be achieved through national budgets. 15 Bird and Tarasov (2004) and Goodhart & Smith (1993) indicate that intergovernmental transfer is the best approach to rectifying interregional fiscal disparities.

Traditional fiscal federalism literature addresses two economic rationales for unconditional intergovernmental transfers (Ma, 1997; Shah, 1994). First, they eliminate vertical fiscal imbalances. In most countries, the national government has a larger tax base than local governments, but intergovernmental transfers can shift resources from the

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14 The Tiebout sorting mechanism was proposed by Tiebout (1956). He argued that if migration is costless, residents will move to jurisdictions where the policy and tax scheme can best describe their preferences. On the government side, in order to attract residents, fiscal autonomous local governments will “tailor” their spending to correspond to residents’ preferences (Brueckner, 2004). As a result, residents are sorted by level of income and preference of policy. Tiebout sorting mechanism leads to income-homogeneity jurisdictions, while it also enlarges the fiscal disparity across jurisdictions.

15 Prud'homme (1995) cited empirical studies of the relationship between national budgets and interspatial disparities in France, Brazil, Cote d’Ivoire, Thailand, and Morocco. All of their empirical results lend support to the assumption that interregional fiscal imbalance can be mitigated through national arrangements, such as intergovernmental transfers.
national government to localities. They also reduce horizontal fiscal disparities. On the revenue side, some jurisdictions may have broader tax bases, natural resources, or richer residents than others. This creates differences in fiscal capacity. On the expenditure side, some jurisdictions have heavier expenditure burdens than others, including more education or welfare expenses due to special population structures. For example, jurisdictions whose elder population is greater may imply the expenditures on medical care, retirement care, or other social welfare demands are more than those who have fewer elder population. The gap between expenditure needs and available revenue leads to fiscal disparities. Further, Ma (1997) indicates that the national government in some countries is obligated to maintain a minimum level of local public services, and regions with insufficient resources to provide this minimum service should be subsidized. As a result, equalization transfers become an essential part of these countries’ fiscal decentralization.

Design of Equalization Transfers — Discretionary and Formula-Based Transfers

As discussed in the previous sections, there are two forms of unconditional transfers — formula-based and discretionary. Bahl and Linn (1994) specify that discretionary lump-sum transfers give national government the maximum flexibility to redirect the flow of resources. To some extent, this kind of transfer system can limit local autonomy and decrease the importance of local governments. In addition, the negotiations and lobbying activities involved in the process make the funds unstable,
uncertain, and non-transparent, which violate the standards of an effective grant system.\textsuperscript{16} Finally, the discretionary system can be an obstacle to regional equalization.

Boadway et al. (2006) argue that discretionary transfers create incentives for local governments to negotiate for the distribution results, and this has been a source of fiscal indiscipline in local governments in Argentina and Brazil. Furthermore, when politics are involved in the allocation of grant funds, poorer regions do not always benefit. As early as 1989, Inman (1989) found that federal grant allocations to states in the United States reflect bargaining results in the legislature rather than balances in regional fiscal capacity. Grossman (1994) provided a political expediency explanation to his examination of federal grant distribution across 49 states, which concluded that receipt of federal grants positively correlated with states’ political capital. Worthington and Dollery (1998) also found empirical evidence in Australia, lending support to the argument that greater political capital correlates to greater equalization transfers. Discretionary transfers create a relatively non-transparent environment for local governments’ funding, and the complicated budget process of the former makes it difficult for voters to hold local government accountable for their fiscal performance. Rodden et al. (2003) indicate that a transparent and clear rule for equalization transfer is necessary.

Ma (1997) suggests that the formula-based transfer system is superior to the discretionary system in three areas. First, it allows the central and local governments to explicitly address the issues of regional fiscal disparity. In addition, its transparency minimizes possible bargaining and lobbying activities in the legislature or executive.

\textsuperscript{16} Shah (1995) identified four important criteria for an effective transfer system: (1) transfers should improve the recipient’s revenue adequacy; (2) transfers should not discourage tax efforts; (3) transfers should correspond to local fiscal needs and contradict to local fiscal capacity; (4) transfers should be able to ensure transparency and stability.
agencies, because the each local government’s entitlement is determined by a formula with objective variables. Finally, with the appropriate design, the formula-based system is expected to eliminate local fiscal indiscipline like overspending or weak taxes.

Kitchen(2006) also claimed that formula-based equalization transfers are preferred over discretionary transfers, since they are more predictable, flexible, and accountable. Formula-based transfers are thus encouraged on the grounds of transparency and predictability (Khemani, 2004). However, Khemani also argues that formula-driven transfers do not necessarily bring equalization, since political factors could mediate their impact — and this has been a reality in Nigeria, where formula-based transfers undermine accountability in local governments. Transfer formula designs need to be considered carefully.

Theoretically, an appropriate design of the transfer formula should have the following three characteristics (Bahl & Linn, 1992): 1) transfers are determined objectively and openly; 2) transfers are stable from year to year; and 3) the transfer formula is transparent. The formula design itself should be “very clearly defined, with resources allocated according to objective criteria which cannot be manipulated by recipient governments, and with little room for discretion and bargaining between the different levels of government” (Stein, 1998, p. 101). Further, equalization transfers need to satisfy two principles: the principle of fiscal capacity and the principal of fiscal responsibility (Cappelen & Tungodden, 2007). These principles are based on the assumption that the tax base is not controllable at the local level, while the tax rate is. The principle of fiscal capacity stresses that the formula has to be able to equalize regional fiscal imbalances
due to tax base differences. The principle of fiscal responsibility indicates that the formula design should not impact local tax rate decisions.

Ma (1997) identifies the four types of distribution formulas most frequently used. The first type of equalization formula concerns regional fiscal capacity with adjustments for expenditure needs. This kind of formula is used in most of Asian countries and in Australia and Germany. It considers the “full equalization” by including both the revenue and expenditure sides, while leaving room for political negotiations about the level of expenditure needs the local government has. The second type of equalization formula involves differences in fiscal capacity among regions. The Canadian Equalization Program employs this kind of formula. It is easier to implement than the first type and limits the potential problems associated with political interventions, but the lack of consideration for expenditure needs generates another inequity problem and discourages public service provisions. The third type of transfer formula considers fiscal needs. Ma (1997) indicates that countries adopt this kind of equalization program, such as India, Italy, and Spain, simply because the data for calculating fiscal capacity are not easily accessible. The variables chosen to calculate fiscal needs could involve bargaining and lobbying activities, therefore, the impact on regional equalization is suspicious. The fourth type of formula aims to allocate an equal amount of money to people. This kind of equalization is the easiest to implement among the four, but it is the weakest in terms of equalizing regional fiscal disparities. The examples of this type of transfer formula are the German VAT sharing program, Canadian EPF, the England’s NDR, and some of Indonesia’s unconditional grants (Ma, 1997, p. 36).
Issues of Equalization Transfers

There have been some theoretical debates over whether equalization programs promote or impede economic efficiency (Shah, 1994). Proponents assert that equalization transfers are justified on both equity and efficiency grounds since they can eliminate regional migrations caused by fiscal disadvantages (J.M. Buchanan, 1950; Flatters, Henderson, & Mieszkowski, 1974; Oates, 1972, 2005). However, opponents such as Courchene (1978) argue that equalization transfers may induce inefficient resource allocations — for example, the equalization mechanism makes migration unnecessary, therefore, labor does not move out of the region. Shah (1994) concluded that there is not an universal best choice about whether to adopt the equalization transfer mechanism or not, instead, “equalization must be recognized as a matter of political taste” (p.3). For example, the United States does not have an equalization program. The format of equalization transfers, discretionary or formula-driven, is contingent on political environments.

Another frequent criticism of equalization transfers concerns their adverse incentive to local tax efforts. This perspective argues that equalization mechanisms create impressions that wealthier regions are penalized by receiving less transfer money, and local governments are encouraged to decrease their tax rates to attract more transfers. However, Ma (1997) contends that most countries use fiscal capacity as the disparity variable in the distribution formula, and thus the equalization transfer program is independent from local governments’ decisions on tax rates. Boadway, Shah, and Inc.NetLibrary (2006) also suggest that the distribution formula should use the variable that addresses regional differences in fiscal capacity rather than actual revenue. Moreover, through the
appropriate design of distribution formulas, equalization transfers will not discourage expanding the tax base, i.e., the declining transfer money should not exceed the losses from reducing tax bases (Ma, 1997).

Finally, Boadway, Shah, and Inc.NetLibrary (2006) argue that when the national government is obliged to or creates the expectation that it is obliged to assist with local deficits, soft budget constraints will appear. From a theoretical perspective, when local expenditures are financed by intergovernmental transfers, the common pool problem is raised that and increase the public spending above an efficient level (Fukasaku & Mello, 1998; Goodspeed, 2002). On the other hand, excessive reliance on intergovernmental transfers may reduce the transparency of budget processes and accountability in local level governments. Some local governments in Germany and Sweden encounter accountability problems that are due to their equalization transfer programs (Boadway & Shah, 2006). The issue of expansion of public expenditures, and the issue of local financial accountability will be discussed in the following sections.

**Fiscal Decentralization, Equalization Transfers, and the Size of Public Expenditure**

**Fiscal Decentralization and the Size of Public Expenditure**

There are two arguments about the relationship between fiscal decentralization and public sector size. The *inverse relationship* argues that fiscal decentralization is related to

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17 According to Oates (2005), the term “soft budget”, firstly suggested by Kornai (1979) and broaden its meaning by Kornai, Maskin, & Roland (2003). It refers to the situation that an organization expects that its budget deficits can be rescued by others. In the context of fiscal decentralization, soft budget constraints often refers to that the local governments can obtain some resources from intergovernmental transfers from above or borrowing.

18 More detailed discussions of the common pool problem can be found in Weingast, Shepsle, & Johnsen (1981) and Hagen & Hardend (1995).
smaller governmental size. This perspective is inspired by the Tiebout model (1956), which suggests that income-homogenous jurisdictions are a result of the sorting mechanism caused by resident mobility. Based on the Tiebout sorting mechanism, Musgrave (1959) contends fiscal decentralization implies a smaller governmental size, since each jurisdiction provides specific public services. In addition, the Leviathan hypothesis (Brennan & Buchanan, 1980) argues that fiscal decentralization encourages regional competitions and thus restrains local bureaucrats from maximizing local budgets. This hypothesis indicates that the more decentralized the fiscal system, the smaller the governmental size.

In contrast, the direct relationship contends that fiscal decentralization is associated with larger governmental size. The first argument of the direct relationship relates to productive inefficiency. Oates (1985) argues that the Leviathan hypothesis concerns only efficiency on the demand side, while the loss of economies of scale in providing public services at the local level leads to productive inefficiency. Closely related to this argument are the higher administrative costs caused by a complicated governmental structure, i.e., a decentralized fiscal system (Heil, 1991). In addition, Oates, inspired by John Wallis, indicates that local residents have more access to local public policies than national policies, and therefore tend to request that more functions and responsibilities be carried out at the local government level (Oates, 1985, p. 749). In summary, the Oates/Wallis hypothesis suggest fiscal decentralization leads to the larger governmental size, primarily due to 1) lower productive efficiency and higher administrative costs in local governments; and 2) claims for various local public goods and services.
Empirical studies of the effects of fiscal decentralization on governmental size fail to find a conclusive result, as summarized in Table 5. Empirical works that find mixed support for both the Leviathan and Oates/Wallis hypotheses suggest that the results are contingent on 1) which level of government’s size is used as the indicator of the public sector size; and 2) the context of the country’s fiscal decentralization.

### Equalization Transfers and Public Expenditures: The Flypaper Effect

Brennan and Buchanan (1980) address the special issue of intergovernmental transfers and argue that transfers lead to more governmental spending, because local governments will organize and expand expenditures to capture more transfers. However, Kothenburger (2005) specifies that the expenditure impacts of transfers are conditioned on the designs of equalization formulas. Specifically, he argues that when formula components respond to regional differences in tax capacity, the transfer scheme favors regions with higher tax rates and leads to the expansion of public expenditures. On the other hand, if the formula corresponds to the regional differences in actual tax revenue, it encourages tax competition and helps to decrease the size of the public sector.  

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19 Kothenburger (2002) provides a detailed demonstration of the models.
Essentially, the study of the relationship between lump-sum (equalization) transfers and the size of public spending are not limited within the context of fiscal decentralization. Traditional neo-economic theory, proposed by Bradford and Oates (1971), indicates that the spending effect of lump-sum transfers is equivalent to private income, since the increases of lump-sum transfers and private income have the same level of income effect. However, this traditional model is considered a purely economic model because it does not take political institutions, strengths, and administrative processes into account (Chubb, 1985). In addition, empirical estimates of the effects of grants from the 1970s to the present attributed the increase of lump-sum transfers to significantly larger new public spending than to increases in private income (Bailey & Connolly, 1998; Becker, 1996; Bowman, 1974; Deller & Maher, 2005, 2006; Feldstein, 1978; Gamkhar & Oates, 1996; Gramlich, Galper, Goldfeld, & McGuire, 1973; Helen F. Ladd, 1993; Lalvani, 2002b; Lyons & Morgan, 1977; Marshall, 1991; McGuire, 1979; Tuttle, 2004; Weicher, 1972). These “anomalous” findings have been referred to as the flypaper effect, which addresses the phenomenon that the grant recipient chose to spend the excess amount of received funds on public services.

From the perspective of the flypaper effect, equalization transfers seem to trigger an increase in public expenditures that may be beyond the efficient level of local spending, potentially wasting public resources. The current literature that provides explanations for the presence of the flypaper effect is divided into two groups. One group focuses on the estimate models and attributes the flypaper effect to statistical errors. The other group offers theoretical explanations.
Some early literature argues that the empirical findings of the flypaper effect were merely results of *misspecifications* of the type of grants (Barnett, 1993; Bowman, 1974; Chernick, 1979; Gramlich, Galper, Goldfeld, & McGuire, 1973). Specifically, they indicate that matching grants have considerably larger spending effects than lump-sum grants, and therefore “the incorrect categorization of the grant as lump-sum may generate a measured larger income effect from the grant than from private income” (Fisher, 1982). Second, previous literature takes the grant variable as *exogenous* to the econometric model, but some grants are dependent on federal reactions to state and local spending, thus grant money and the level of expenditures are inter-determined (Becker, 1996; Chernick, 1979; Knight, 2002; A. C. Worthington & Dollery, 1999). Becker (1996) and Worthington & Dollery (1999) argue that the failure to control for the endogeneity of grant variables may overestimate the expenditure effect of grants. Third, the estimated results are sensitive to *modeling techniques*. For example, Becker (1996) found that it is easier to conclude the presence of the flypaper effect using linear models. Finally, Hamilton (1983) argued that empirical studies tend to offer very simple models with *inadequate control variables*, and thus put too much weight on the included variables. The other problem with empirical studies is that when the model includes many *irrelevant variables*, it is easy to misinterpret the coefficients on important variables.

In contrast to literature that assumes the flypaper effect is a result of econometrical errors, there are theoretical explanations for the drivers of the flypaper effect. The fundamental reason is the *competing nature* of the federal-state relationship, which notes that the disharmony of interests between the federal and state-local governments leads to

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20 Neo-economics specifies that matching grants are recognized as having both income and price effects on public spending, while lump-sum grants have only income effects.
overspending (Break, 1967; H. G. Meyers, 1987; Volden, 2005; Wilde, 1971). In addition, Romer and Rosenthal (1980) argue that political institutions’ agenda manipulation may lead to excessive expenditures, as well. Courant et al. (1979) indicate that a voter’s fiscal illusion about the cost of public services leads to the overspending. There are still other explanations for the existence of the flypaper effect in current literature, such as competing for grants with neighboring jurisdictions (Boarnet & Glazer, 2002), voter’s perceptions of tax exportability (Bowman 1974), the uncertainty of grants and risk-averse bureaucrats (Fossett, 1990), the lobbying activities of pressure groups (Dougan & Kenyon, 1988), the political strength of a multi-party political environment, and the officials’ consideration of transaction costs (Tovmo & Falch, 2002).

The effect of CATR funds on local spending has not yet been examined, but the claims for increasing the CATR funding pool continue today. However, inefficient spending (overspending) causes resource, waste, and accountability problems. This dissertation makes an attempt to test the flypaper effect of the CATR program.

**Local Government Fiscal Accountability**

**Fiscal Decentralization and Local Government Accountability**

The Asian Development Bank (ADB) has defined four important elements of good governance: accountability, transparency, predictability, and participation (ADB, 1995). The four elements are interrelated, and accountability is at the center—“accountability is often related to participation, and is also the ultimate safeguard of predictability and transparency” (p. 12). The demand for government accountability has become worldwide. This trend is especially pervasive in Asian countries, since most Asian countries have a
relatively centralized system, and people have been passive regarding public services in the past (Hayllar, 2000). Fiscal decentralization brings decision makers closer to residents, but local accountability is not automatically ensured because of this. An accountability mechanism has to be established.

Local fiscal accountability has been specified as a major danger of developing countries’ fiscal decentralization (Litvack, Ahmad, & Bird, 1998; Prud'homme, 1995; J. Rodden, 2002). Treisman (2000) provides empirical findings that indicate decentralization is associated with corruption. Prud'homme (1995) argues that local governments in a fiscally decentralized system find it easier to engage in corruption than in a centralized system. There are two reasons for this. First, local politicians and bureaucrats are more subject to local interest groups because of their need for money and votes. This is the most popular argument for the relationship between fiscal decentralization and corruption — see also in Bardhan (1996), Bardhan & Mookherjee (2006), Crook & Sverrisson (1999), Lieten (1996), Manor (1999), Mathew & Nayak (1996), Smith (1985), and Tanzi (1996). Monitoring and auditing also are more intense in the central government than in local governments — see also in Brueckner (2000), Tabellini (2000), and Tanzi (1996). Recent literature has found that equalization transfers could undermine local fiscal discipline because of the problem associated with the soft budget constraint (Goodspeed, 2002; János Kornai, Maskin, & Roland, 2003; Qian & Roland, 1998; J. A. Rodden, 2002). The concept of the soft budget constraint refers to the situation when local budget is largely financed by money from taxpayers outside the region, i.e., intergovernment transfers, local officials may have more opportunities to
engage in corruption, since residents may not have full information about available public resources.

The weakness of information disclosure and a non-transparent budgetary process may give rise to overspending, unreliable services delivery, and the lack of governmental accountability (Schaeffer, 2005). A weak accountability system may then lead to resource misallocations and eventually disadvantage poor people and poor regions. Therefore, strengthening local financial accountability is especially important to developing countries in their fiscal decentralization process.

The Concepts of Local Fiscal Accountability

From a theoretical perspective, the public choice model of local governmental budget assumes that local politicians are interested in pursuing votes to secure their reelection, and local officials are interested in holding their incumbencies. To extend their tenure, they may choose either to engage in corruption and provide politically generated benefits to their constituents directly or foster economic development and provide benefits indirectly (Careaga & Weingast, 2003). Since these choices generate equal benefits for politicians, a monitoring mechanism is necessary to encourage or direct them not to choose corruption. In this section, the dissertation discusses the concepts of local financial accountability. Specifically, the focus is on two questions — local financial accountability for whom and for what?

For Whom.

Accountability has three dimensions: bottom-up, horizontal, and vertical (Schaeffer, 2005). Bottom-up accountability means the local government is accountable to its residents and taxpayers. Residents and taxpayers present their opinions through civic
organizations and elections. In the context of fiscal accountability, the bottom-up approach addresses the importance of information disclosure (the outcome transparency) to the public. *Horizontal accountability* means local governments are held accountable to other governmental agencies, including auditing agencies, local councils, and courts. Horizontal fiscal accountability specifies the need to establish checks and balances on local financial management among these agencies. *Vertical accountability* means that local governments are held accountable to higher-level governments. The higher level may set rules and guidelines to ensure that local governments provide services that are in accordance with their responsibilities, and to ensure the use of public resources is efficient. Specifically, since local governments receive intergovernmental transfers from a higher-level government, they have the obligation to report the use of the funds to their grantors.

*For What.*

Local governments are accountable for the use of public resources and program results. Schiavo-Campo and Sundaram (2000) argue that effective accountability involves answerability and consequences. Local governments should be able to respond to periodic questions about the management and flow of their resources, and the level of completion of their goals. They should be responsible for “effective spending and the performance of public funds” (Schaeffer, 2005, p. 6).

Local governments are responsible for planning and carrying out the operations of the account for the entire fiscal year while staying within the budget limits. Meyers (1996) specifies several characteristics of an effective budget that can enhance governmental performance, and these characteristics can be regarded as important objectives for local
fiscal accountability. First, local governments are accountable for the *efficiency and effectiveness of budget information disclosure*. Meyers specifies that the characteristics of an effective budget include transparency, constraint, timeliness, honesty, and judgment.

Second, local governments are accountable for the *legitimacy of the budgets*. The revenue and expenditure flow should be within the power and function of local governments (Schaeffer, 2005). Third, local governments are accountable not only for the current budget, but also *long-term financial plans and other public services*. Finally, and probably the most important objective in the context of fiscal decentralization, local governments are held for *responsive accountability* — governmental budgets should be able to correspond to regional preferences.  

A conceptual discussion of fiscal accountability is presented in this section. Local governments are held fiscal accountability to the citizens, other agencies, and the higher level of governments. Local governments are accountable for effective budgets — effective spending and the performance of public funds — including efficient and effective information disclosure on budget associated events, the legitimacy of local budgets, the longer term financial plans, and the responsiveness of local budgets to local preferences.

**The Practices of Local Fiscal Accountability**

Fiscal or budget transparency, a timely and systematical disclosure of all budget and public finance information to the public, has to be recognized as a key aspect of good governance and greater governmental accountability (IMF, 2008; OECD, 2002). The goal

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21 Leat (1988) identified *responsive accountability* as accountability which takes into account the demands of those to whom they are accountable. In the context of financial accountability, responsive accountability implies the financial arrangement corresponds to different local needs.
of fiscal transparency and fiscal accountability is to enable the electorates and the financial markets to accurately assess the government’s current and future financial positions (Heald, 2003). The International Monetary Fund (IMF) and OECD have developed practical approaches to improve the degree of governmental fiscal or budgetary transparency to enforce governmental accountability. The standards and codes provided by the two institutions are often subject to different cultures, histories, and governmental structures of countries. Nevertheless, they link the concepts of fiscal accountability to practices and allow countries to prepare a self-evaluation on the accountability mechanism.

The most widely used fiscal transparency manual is the IMF Code of Practices on Fiscal Transparency (the Code), which was first developed in 1998 by the IMF and revised in 2001 and 2007. The Code is based on four main principles (IMF, 2007a). The first principle requires the clarity of roles and responsibilities. This principle emphasizes the importance of the institutional and legal framework of fiscal administration among vertical and horizontal governments and a clear distinction between public and private/commercial activities. According to the Code, the roles and responsibilities in the financial management of each government should be made clearly to the public. The second principle involves open budget processes, for which relevant budget information should be made understandable and standardized. Budget documents should explicitly state fiscal policy objectives, the economic assumptions used to forecast revenue, and the risks of uncollected revenue. In addition, the budget procedure, including the proposal submission, the budget execution, and the expenditure monitoring should follow a regulated timetable. The third principle is the public availability of information. The
budget and fiscal information should be published in a timely manner and should include past, current, and prospective fiscal activities. The final principle accentuates the *assurances of integrity*. The practical codes of this principle include the quality of presented data, the independency of the scrutiny agency, and the necessity for internal auditing.

Currently, more than 90 IMF member countries have utilized the *Code* to prepare their self-evaluations on the governmental fiscal transparency. Their *Reports on the Observance of Standards and Codes* (fiscal ROSCs) may be accessed through the IMF’s Standards and Codes web page.22 The IMF *Code* establishes a recommended minimum standard for all countries to review their accountability mechanism, while the OECD developed a set of a more demanding standards for the member countries (Heald, 2003). OECD proposed a set of *Best Practices for Budget Transparency* (*Best Practices*) (OECD, 2002) based on surveys on its member countries. *Best Practices* lays out a set of systematic approaches on budget development and implementations to improve governmental financial accountability. Three major dimensions are addressed in the OECD *Best Practices*: the principal budget publications and their appropriate contents, the specific information that should be included in the publications, and the practical ways to ensure the quality and integrity of those publications. The OECD *Best Practices* provides a more detailed instruction toward governmental budget transparency than the IMF *Code*, but it is more applicable to the OECD countries and thus is not used as widely as the IMF *Code*.

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Conclusion

This chapter provided a review of the current literature on fiscal decentralization, equalization transfers, expenditure impacts of lump-sum transfers, and financial accountability. The review confirms that intergovernmental transfers have been played important roles in fiscal decentralization, especially in countries with more centralized governmental apparatuses. Several issues were addressed around the use of equalization transfer programs to improve inter-jurisdictional fiscal disparity. The expenditure stimulus effect, or so-called the flypaper effect, was also discussed. The accountability linkage was built from the current literature.

This chapter reviews important theoretical arguments and empirical findings on the three topics of this dissertation. This chapter also offers the frameworks necessary to inspect data and build up analytical schemes to answer the research questions. The analyses presented in Chapter Four through Chapter Six are based on the theories and empirical insights offered in the current literature.
Chapter Three: Research Design

This dissertation is organized around three independent but linked studies to answer the three research questions stated in Chapter I. This chapter describes the research design and analytic approaches for evaluating the CATR program and local financial accountability in Taiwan. Multiple methods were employed to collect and analyze data.

The first essay, presented in Chapter Four, was completed through quantitative data analyses and semi-structured interviews. The second essay, presented in Chapter Five, was completed by testing the flypaper effect using Nagamine’s (1995) institutionalized expenditure model. Specific model illustrations and model issues are discussed in Chapter Five. Interview results from the first and third essays also provided useful information to analyze regression results shown in Chapter Five. The third essay, presented in Chapter Six, was completed through a review of laws, regulations, official reports, governmental websites, and through semi-structural interviews. The overall research design is presented below:

Unit of Analysis and Time Period

The conceptual unit of analysis for this dissertation is all second level governments except for Chin-men and Lian-chian counties. The sample includes the Taipei and Kauhsiung municipality, Taipei County (upgraded to a semi-municipality in 2008), and 20 counties and cities that are directly supervised by the national government. The terms local governments, local finance, and local accountability throughout the dissertation refer to all of the 23 second-level governments. The two excluded counties, Chin-men

23 The translations of names of counties and cities from Chinese to English are in Appendix III.
and Lian-chiang, are geographically different from the 23 counties and cities, and they did not belong to the Taiwan Province before the year 2000.\textsuperscript{24}

The time span of the collected official data ranges from 1992 to 2007. It covers both the periods of implementation of the discretionary and formula-based allotted tax revenue program. Data from this time span enable comparisons of the distributive efficiency and fiscal impact between the discretionary and formula-based distribution are of major significance in this dissertation. As for the evaluation of local financial accountability, only current laws, regulations, and the most recent year budgetary documents are reviewed, and interviews are constructed to evaluate current accountability mechanism only.

\textbf{Data and Data Sources}

Each of the three essays in this dissertation deals with a specific research question. Different methods were employed to collect and analyze data to answer the three questions. Reviews of governmental documents and regulations provided information on formal budget processes, responsibilities among agencies, formal accountability (auditing) mechanisms, and the procedure of distributing CATR funds. The semi-structured interviews with managerial level local officials captured information about the management practices, processes of budget decisions, principles, and practices of the current local financial accountability mechanism. Official statistical data were used as inputs to generate comparable indicators such as fiscal disparities and estimate model variables.

\textsuperscript{24} Chin-men and Lian-Chiang belonged to the Fukien Province before year 2000. The history behind this difference between the two counties and other 21 counties (cities) is not the focus of this dissertation, while it is important to know that the pre-formula allotted tax revenue program was not implemented in the Fukien Province.
There were several difference data sources used, as none provided complete information on its own. Demographic data were drawn from the *Taiwan-Fukien Demographic Fact Book, Republic of China* (1990-2005) and the *Demographic Fact Book, Republic of China* (2006, 2007), published by Taiwan’s Ministry of Interior (MOI); the MOI website; and Taiwan’s National Statistics website at [http://eng.stat.gov.tw/](http://eng.stat.gov.tw/) (English), or the online database at [http://61.60.106.82/pxweb/Dialog/statfile9.asp](http://61.60.106.82/pxweb/Dialog/statfile9.asp) (Chinese).

Fiscal data were found through the above-mentioned online database or through the *Annual Audit Reports* of each local jurisdiction, published by Taiwan’s Ministry of Audit (MOF) and the *Annual Financial Statistics Report*, published by MOF. Fiscal data for years prior to 2002 were found in the MOF archives, while more recent data are available on MOF’s website.

All financial data was deflated by the consumer price index (CPI) to construct time-series empirical models. Taiwan’s historical CPI is now available on the Directorate-General of Budget, Accounting, and Statistics (DGBAS) website. A better deflator of governmental financial information would be the index that reflects public sector purchases and investment. This information, however, is not available in Taiwan. In addition, all data were considered in per capita terms for comparison purposes.


Multi-Methods: Data Collection and Data Analysis

Essay 1 (Chapter Four): The Examination of Distributive Efficiency of the CATR Program

The first research question focuses on whether the distribution of CATR funds targets the neediest (poor regions). The empirical questions 1a-1c, used to operationalize research question 1, are answered using quantitative data analysis, semi-structured interviews, and content reviews of the distribution regulation of CATR.

Research Question 1a

To answer the first empirical question: “How does the current CATR program operate,” this dissertation reviewed the Distribution Regulation. Through the review process, several issues were identified. Also, semi-structured interviews with the open question: “Could you please tell me the positives and negatives of the current CATR program,” were conducted. Interviewees were managerial level officials from local divisions of finance. The sampling method is introduced later in this section.

Research Question 1b

To answer the second empirical question: “Does the formula-driven program reduce more fiscal disparity than the discretionary program,” Bird and Tarasov’s (2004) comparison approaches were adopted to explore the difference in regional fiscal disparity between the period when the distribution of the funds are determined discretionarily and the period when the distribution is based on a formula. The comparison started with the introduction of indicators selected to measure inter-jurisdictional fiscal disparity, followed by the variables chosen to generate comparable indicators, and then by the introduction of the comparison strategy.
Indicators of Fiscal Disparity

Two measurements, coefficient variations (CV) and maximum to minimum ratio (MMR), were used to conduct longitude comparisons of fiscal disparity over the 16 years. CV, or the “σ – convergence ,” is a commonly used approach to explore the convergence of units with respect to financial conditions. It is often used to examine the cross-sectional dispersion of financial variables, and the dispersion reflects interregional fiscal imbalances (Richard M. Bird & Tarasov, 2004; Shankar & Shah, 2001). Larger coefficient implies a higher level of dispersions and a higher level of fiscal disparities.

The following notations and variable descriptions are as in Bird and Tarasov (2004):

\[
CV_t = \frac{\sum_{i} (y_{t,i} - \bar{y}_t)^2 \cdot \frac{1}{N}}{\bar{y}_t}
\]

where \(y_{t,i}\) denotes the per capita financial variables of region \(i\) in year \(t\); \(\bar{y}_t\) is the average per capita value of the variables in year \(t\), calculated as \(\frac{y_t}{N}\); \(N\) is the number of regions in the sample.

\(0 \leq CV \leq 1\), greater \(CV\) indicates higher fiscal disparities.

However, \(\sigma – convergence\) simply indicates if the financial index has achieved a more even distribution, it does not necessarily mean the gap between the poorest region and the richest region declines. The justification of the CATR program is to reallocate local revenue from the wealthier to the poorer regions. The declined \(CV\) cannot be directly inferred to the difference between the extreme cases. To complement the measurement of fiscal disparity, the second indicator, MMR, was also used.

MMR measures the disparity ratios of the richest region to the poorest region.

\[
MMR_t = \frac{Y_{\text{max},t}}{Y_{\text{min},t}} \cdot 100\%.
\]

\(Y\) denotes the financial variables, \(Y_{\text{min},t}\) (or \(\text{max},t\)) is calculated from
the percent of the per capita value in the lowest (or highest) region to the national average per capita value in year t. This indicator measures “perfect equity” (Shankar & Shah, 2001), larger value indicates higher level of fiscal imbalances.

Variables Selected for Fiscal Disparity Measurements

In American and European contexts, fiscal disparities refer to the differences of fiscal capacity and tax efforts among regions. The equalization scheme for the lump-sum transfer system emphasizes that “the balance between contributions made and the value of public services returned to the individual should be the relevant figure” (J. M. Buchanan, 1950, p. 588). This situation, however, is not fully applicable to Taiwan, because local governments in Taiwan have only limited taxation power.25 Lump-sum grant systems in Asian countries seldom involve eliminating the regional differentials in tax efforts, but rather they are more concerned with equalizing the differences in regional “fiscal positions.” A fiscal position is fiscal capacity adjusted for expenditure needs. For example, Musgrave and Musgrave (1989) defined fiscal position as the ratio of fiscal capacity to fiscal needs. Many Asian countries utilize the concept of fiscal position to develop their equalization transfer systems,26 including the Taiwanese CATR program.

According to the CATR distribution formula, 85 percent of the divisible funds are distributed based on the differences between “basic financial needs” (BFN) and “basic financial revenue” (BFR): Fiscal Position = BFN-BFR. The concept of this program

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25 According to the General Act of Local Tax Laws, local governments, including municipalities, counties (cities), and townships can levy special taxes, surtaxes, or temporary taxes on certain groups under its jurisdiction approved by local councils, but they can collect special taxes and surtaxes no more than 4 years and temporary taxes no more than 2 years. Intends to continue these taxes can be achieved only when they go through again the formalities. Besides, municipality and county (city) governments are able to increase tax rates but not by more than 30% of the premium tax levy on municipality and county (or city) taxes (excluding Stamp Tax and Land Value Increment Tax).

26 For example, the Japanese Local Allocation Tax, the Korean Local Shared Tax, and China’s returned revenue system are designed according to local governments’ relative fiscal positions.
design is to ensure that local government’s basic/minimum level of public services (i.e., the BFN) is secured. A detailed introduction of the distribution formula is presented in Chapter Four.

To examine the efficiency of fiscal disparity reductions, the indicators used to measure the fiscal disparity should relate to the goal of the CATR program — the equalization of a local government’s ability to provide basic level public services. The calculation of BFN is related to local expenditures on formal civil servants, and the goal of CATR program is to increase local government’s available own-source revenue to maintain the BFN.\(^{27}\)

Therefore, the first variable used to measure the effectiveness of the formulated CATR is “Affordability”, defined as the ratio of own source revenue (including CATR funds) to personnel expenses:

\[
\text{Affordability} = \frac{\text{County}(city)\text{OwnSource Revenue}}{\text{County}(City)\text{PersonnelExpenses}}
\]

In addition, since the BFN are secured by the CATR program, local governments are able to shift some of their resources to other expenditure categories. Thus, the second indicator is the non-basic expenditure (NBE). This indicator is denoted as:

\[
\text{NBE} = \text{Total County (city) expenditure} – \text{county (city) personnel expenses} – \text{county’s (city’s) obligated portion of social welfare expenses}^{28}
\]

The third variable involves the revenue side. One of the most common criticisms of an equalization transfer program is that it may adversely affect the local government’s tax efforts. Considering that the equalization scheme of the CATR program redistributes revenue from richer to poorer regions, it may give the impression that richer regions are

\(^{27}\) In the legal framework, the received allotted tax revenue is considered local government’s own tax revenue.

\(^{28}\) The calculation of BFN also includes the relative size of county (city) expenditures on the obliged portion of social welfare.
penalized. Although the BFR excludes local governments’ discretionary tax revenue, it is not clear about whether local governments are willing to expand their tax bases or increase tax rates under such institutional design. Therefore, the differential in the local government’s self-raised revenue (SR) becomes an important variable to examine fiscal disparity. This variable is denoted as:

\[ SR = \text{Total Revenue} - \text{Received CATR Funds} - \text{Other Grants} - \text{Borrows} \]

**The Comparison Approach**

The CV and MMR for each year will be calculated to reflect the static situation of fiscal disparity for a specific year, but dynamic presentations release information about the change of fiscal disparity over time. Research question 1b addresses the issue of the different effects of formula-based and discretionary distributions, and thus a dynamic view can provide direct evidence on which one works better. If the CV and MMR show significant reductions in the period of formula-based distribution, as compared to the period of discretionary distribution, the use of distribution formula will be recognized as superior. Therefore, time profiles of these static measures were established for comparison purposes, along with charts that depicted the disparity indicators over time.

Specifically, the reduction of CV implies the presence of \( \sigma - \text{convergence} \), which is recognized as the distribution of the financial variables being more equitable (Milton, 1992; Quah, 1993). The reduction of MMR indicates that the gap between the richest and the poorest region shrinks — this implies a trend toward perfect equity. Finally, Bird and Tarasov (2004) suggest that comparisons between the pattern changes of the “per capita own revenue” indicator and the “per capita total expenditure” indicator directly demonstrate the extent to which intergovernmental transfers offset horizontal imbalances.
Therefore, this dissertation will compare CV and MMR trend changes of Affordability and SR to signify the effects of the CATR program.

**Research Question 1c**

The question 1c: “Does the current distribution formula take demand and poverty into consideration” was answered through the correlation coefficients between received CATR funds and selected demand and poverty indicators. The Spearman rank-order correlation coefficient ($\rho$) was adopted. The Spearman rank-order correlation coefficient is a nonparametric test that is used to measure the degree of association and to detect nonlinear relationships between two sets of variables (Aczel & Sounderpandian, 2006).

The two sets of variables that were used to test the relationships in this dissertation were “county (city) CATR funds” and the variables suggested by current theories and county (city) DOF managers. Detailed introductions of these variables are presented in Chapter Four.

The coefficient, $\rho$ is calculated from

$$\rho = 1 - \frac{6 \cdot \sum_{i=1}^{n} d_i^2}{n(n^2 - 1)}$$

where $d_i$ is the difference between the rank numbers of corresponding values of the two variables, and $n$ is the number of objects in the ranking. $-1 \leq \rho \leq 1$, negative $\rho$ implies negative correlation between the two variables. The results of $\rho$ demonstrated which variable is more related to CATR funds receipts. The selected variables reflect the poverty and demand of CATR funds, and the results of $\rho$ suggested whether or not the distribution corresponded to the goal of this program. The research methods of Essay 1, i.e. Chapter Four, are summarized in Table 6.
**Essay 2 (Chapter Five): The Examination of Expenditure Impacts of the CATR Program**

The second theme involves the expenditure impacts of the CATR program. Specifically, it focuses on the appearance of the flypaper effect on local spending.

Existing empirical grant literature typically assumes that expenditure decisions are made based on the median voter model, where local officials are fully informed of the voter’s preference and will maximize the median voter’s needs when resources are available. This assumption, however, is not fully applicable to Taiwan, since there is no budgetary participation mechanism. The regional budget is made by the local government as the representative of the region, under controls of local councils. In addition, the traditional expenditure models assume local governments have discretion over tax policy. This assumption, however, is not held in Taiwan. These two differences between Taiwan

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Does the formula-based CATR program target to the poor regions, as compared to the discretionary one?</th>
<th>Empirical Question</th>
<th>Methods</th>
<th>Techniques of analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research Question</strong></td>
<td>Does the formula-based distribution mitigate regionally fiscal disparities?</td>
<td><strong>Empirical Question</strong></td>
<td>Review of Regulations; Semi-structured Interviews</td>
<td>Investigating into the distribution formula and find which formula factor drives the distribution result.</td>
</tr>
<tr>
<td><strong>Empirical Question</strong></td>
<td>How does the current CATR program operate</td>
<td></td>
<td>Quantitative Data Analysis</td>
<td>Compare the changes of MMRs and CVs during the 16 years.</td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td></td>
<td></td>
<td>Quantitative Data Analysis</td>
<td>Compare the changes of the Spearman Rank-Order Correlation Coefficients between the CATR funds and the four “need”. Exploring which indicator is more related to the increase of CATR.</td>
</tr>
<tr>
<td><strong>Techniques of analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Research Question** | | | | |
and other countries make it inappropriate to adopt the traditional models to detect the existence of the flypaper effect of the CATR program.

Nevertheless, Nagamine (1995) developed a behavior model that differs from the traditional grant model by taking into account that local governments do not have full discretion to change tax rates, and local budget decisions are made without citizen participation. This dissertation employs Nagamine’s institutionalized model and utilizes his explanations of institutionalized flypaper effect.

The research method is summarized in Table 7, and a detailed illustration of the model and discussion of model issues are presented in Chapter Five.

Essay 3 (Chapter Six): The Examinations of Local Accountability Mechanism

The third essay of this dissertation provides an evaluation of the current local financial accountability mechanism in Taiwan. The evaluation was guided by 15 standards of

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29 Nagamine (1995) developed a behavior model for financial decision making of Japanese local government to examine the flypaper effect in the Japanese context. He indicated that traditional models estimate expenditure effect of lump-sum grants on the ground of median voter model, while decision making in Japan local governments simply reflects the behavior of local agencies. Li (2001) adopts his model to test the existence of the flypaper effect of Taiwanese provincial grants.
financial accountability selected from the 2007 *IMF Code of Good Practices on Fiscal Transparency* and the 2001 *OECD Best Practices for Budget Transparency*. The 15 standards are listed in Appendix 1 for the reader’s reference. Many countries report their ROSC to the IMF member peers, but a similar self-evaluation has not been done in Taiwan. While this dissertation focused mainly on the CATR program, there is not a separate account of the CATR in budgetary documents. However, the evaluation of financial accountability of CATR funds is an integral part of the evaluation of the general funds. A throughout examination on the accountability mechanism on the general account would also provide information on the accountability evaluation of CATR funds.

**Evaluation Strategy**

The evaluation was twofold. The first concerned the legal framework built to secure financial accountability of Taiwan’s local finance. Current laws and regulations were reviewed and analyzed to examine if the legal framework in Taiwan corresponded to international standards of financial transparency. The second dimension of the evaluation was concerned with the practical aspect of the local financial accountability system. Evaluations based merely on legal standards may not reflect the reality of the financial accountability mechanism since in some cases local governments may choose to skirt the laws and regulations. Understanding the real situation could help to enact regulations that are appropriate and applicable to current government settings.

The approaches used to insuring financial accountability in local governments in Taiwan include publication of enacted budgets, final account reports, and annual final

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31 Taiwan was recorded as a member country of IMF until China took the seat of Taiwan in 1980.
32 The principal-agent theory has the detailed arguments of this situation.
audit account reports. Content reviews of these governmental publications contributed to a better understanding of the degree of publicity of financial information. Also, it provided information on the differences between the legal standards and the actual implementations. In this digital age, almost all governments in the world make information public on the Internet. Therefore, how much information was made public was another approach to evaluating financial transparency. Finally, publicly accessible information may reflect a major part of the practices of local financial accountability, but there is some information that cannot be found by reviewing government publications and websites, such as organizational culture and customs. To create a complete picture of the financial accountability mechanism in the local governments, semi-structured interviews were conducted to understand the practices of the accountability system. The evaluation plan is presented in Table 8.

### Table 8: The Evaluation Strategy for Local Financial Accountability Mechanism

<table>
<thead>
<tr>
<th>Level of Issue</th>
<th>Legal Standards</th>
<th>Real Situations (Practical Aspect)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questions</td>
<td>Do Taiwanese legal standards correspond to the international financial accountability standard?</td>
<td>How do local governments hold accountability for their implementation of the accountability system on the general fund?</td>
</tr>
</tbody>
</table>
| Methods        | Content reviews on official laws and regulations, including Accounting Law, Budget Law, Budget Settlement Law, and annual Directions for County (City) General Budget Final Account Compilation. | 1. Content reviews on local governments’ budget and audit publications  
2. Reviews on local governments’ websites  
3. Semi-structured interviews with agency managers about their implementation of the accountability system, such as the internal auditing |
Content Review of Laws and Government Publications

The review of regulations included the Budget Law, Budget Settlement Law, and annual Directions for County (City) General Budget/General Budget Final Account Compilation. These regulations were used as guidelines for local governments to prepare their annual budget and annual final account reports, and for the audit department to prepare their annual audited final account reports. Internal auditing standards and accounting law provided information for validity examination. Content reviews of these regulations enabled better understanding about formal processes of budget preparation, execution, and supervision.

Local annual budget reports and budget settlement reports provided information related to the implementation of the laws and regulations. The Annual Comprehensive Audit Reports for Municipal and County (City) Budget Settlement Report, published by the MOF, provided information on the central supervisions of local financial management. Budgetary reports for older than three years were not considered, since this essay is simply interested in the current accountability mechanism. The sampling approach of county (city) budget and budget settlement reports is the same with the interview scheme, which will be discussed in more detail later in this section and in Chapter Four.

Semi-Structured Interview

Semi-structured interviews were conducted to obtain detailed information about the implementation of accountability systems in local governments in Taiwan.

Sample Design

The selected interview participants were managerial level officials from the department of finance (DOF), the department of budget, accounting, and statistics
(DBAS), and the office of audit (OA). The interview included 21 officials. These interview participants included both richer and poorer local governments based on financing dependency criterion. The criterion is defined as the share of total local revenue that is from intergovernmental transfers, including CATR funds. This selection criterion reflects the financial incapability of local governments, which could be considered as an indicator of the wealth of local governments.

The DOF is responsible for financing, taxation, banking, and assets management affairs. In other words, it is responsible for collecting and managing local revenue. Therefore, interviewees from DOF were also asked questions about the current CATR program, and their responses were used to analyze the program. The DBAS is in charge of the county (city) budget, accounting, and statistics affairs. Budget affairs include the preparation of annual budget and budget settlement reports. Accounting affairs focus on the development of county (city) financial management events. Statistical affairs collect and analyze data that are required for the mayor and the local council to make policy decisions. Unlike the United States, which has a finance director to advise the city manager and city commission on financial matters, DOF and DBAS report to county (city) mayors and councils directly.

The fundamental functions of OA include supervising the execution of budgets, examining financial debits, approving final balances, evaluating financial effectiveness, ratifying financial responsibility, and inspecting violations (illegal activities). OA is independent from the local governments and reports directly to the auditor-general, the chair of the Ministry of Audit of Control Yuan. The Ministry of Audit publishes annual comprehensive audit reports for municipalities and counties (cities) final accounts.
Table 9: Budgetary Dependence of 23 Local Governments, 1998-2007

<table>
<thead>
<tr>
<th>Local Governments</th>
<th>BD %</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taichung C.</td>
<td>31.19</td>
<td>1</td>
</tr>
<tr>
<td>Taipei M.</td>
<td>31.89</td>
<td></td>
</tr>
<tr>
<td>Hsinchu C.</td>
<td>33.69</td>
<td></td>
</tr>
<tr>
<td>Tainan C.</td>
<td>34.53</td>
<td></td>
</tr>
<tr>
<td>Taoyuan</td>
<td>34.70</td>
<td></td>
</tr>
<tr>
<td>Taipei</td>
<td>37.38</td>
<td></td>
</tr>
<tr>
<td>Kaohsiung M.</td>
<td>41.11</td>
<td>2</td>
</tr>
<tr>
<td>Hsinchu</td>
<td>48.16</td>
<td></td>
</tr>
<tr>
<td>Taichung</td>
<td>49.97</td>
<td></td>
</tr>
<tr>
<td>Keelung C.</td>
<td>51.26</td>
<td></td>
</tr>
<tr>
<td>Chia-I C.</td>
<td>52.19</td>
<td></td>
</tr>
<tr>
<td>Kaohsiung</td>
<td>54.54</td>
<td></td>
</tr>
<tr>
<td>Tainan</td>
<td>55.77</td>
<td>3</td>
</tr>
<tr>
<td>Yilan</td>
<td>59.78</td>
<td></td>
</tr>
<tr>
<td>Miali</td>
<td>61.01</td>
<td></td>
</tr>
<tr>
<td>Changhua</td>
<td>61.85</td>
<td></td>
</tr>
<tr>
<td>Yunlin</td>
<td>64.71</td>
<td></td>
</tr>
<tr>
<td>Pingtung</td>
<td>66.24</td>
<td></td>
</tr>
<tr>
<td>Chia-I</td>
<td>68.55</td>
<td>4</td>
</tr>
<tr>
<td>Hualien</td>
<td>70.77</td>
<td></td>
</tr>
<tr>
<td>Nantou</td>
<td>73.69</td>
<td></td>
</tr>
<tr>
<td>Taitung</td>
<td>77.40</td>
<td></td>
</tr>
<tr>
<td>Penhu</td>
<td>85.88</td>
<td></td>
</tr>
</tbody>
</table>

The final interview participants included six officials from DBAS, seven officials from DOF, seven officials from OA, and one official from the Ministry of Audit. The selected agencies represented local governments with different financial conditions, based on the relative budgetary dependence (BD) over 10 years (1998-2007), as shown in Table 9. The 23 local governments were categorized into four groups based on their relative wealth. Five local governments were in group 1, $BD = 31.19\%-34.70\%$; six local governments
were in group 2, $BD = 37.38\% - 52.19\%$; six local governments were in group 3, $BD = 54.54\% - 64.71\%$; and six local governments were in group 4, $BD = 66.24\% - 85.88\%$.

**Procedure**

Introductory letters that explicitly stated the reason, general questions, and possible timeframe for interviews were sent to the DOF, DBAS, and OA contacts of 23 counties and cities (see Appendix 3), along with a consent form requesting their participation (see Appendix 4) in mid November 2008. The names, addresses, and email addresses of the budget department contacts were listed on the agency websites.

In the beginning of the interview process, the reason and expected timeframe for the interviews were clearly stated. Relevant data were presented, along with the core questions. A semi-structured interview uses a loosely structured set of questions to acquire important information about the interview subject. The interview was designed to explore the facts that are not revealed in the government documents and websites. The questions were organized around the 15 selected standards. An interview protocol is presented in Appendix 5.

**Ethical Considerations**

All interview documents were approved by the Internal Research Board (IRB) of the University at Albany on October 21, 2008. During the interviews, interviewees were encouraged to express their opinions, and supplemental documents were welcome. All but one interviewee granted permission to be taped. Participants that participated through email exchanges were notified that those emails were kept on file. All interview data were kept confidential. Interviewees understood they had the right to review the
interview manuscripts of their own interview, but no one has requested a review so far.

Thank you cards were sent within one month each interview finished.

**Reviews of County (City) Agency Websites**

Local financial information was posted on the DBAS website, and checked regularly.

Three main questions were asked when conducting website reviews:

1. *What information is publicly available on the county (city) DBAS website? Is there any difference of the degree of information disclosure among counties and cities?*

2. *Is it easily found? (Is its layout user-friendly?)*

3. *How frequently does DBAS update the information?*

The summarized research approaches for chapter six are presented in Table 10.

**Table 10: Research Methods for Chapter Six**

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Empirical Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the current accountability mechanism adequate to hold local governments accountable for the use of their CATR funds?</td>
<td>Is the current accountability mechanism on the general funds and special CATR funds corresponding to the 15 standards selected from 2007 <em>IMF Code of Good Practices on Fiscal Transparency</em> and 2001 <em>OECD Best Practices for Budget Transparency</em>?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods</th>
<th>Review of Laws, Regulations, Budget Documents, Audit Reports; Semi-structured Interviews; Review of governmental websites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Techniques of analysis</td>
<td>Employed these methods to examine Taiwan’s current accountability mechanism on the general fund and special CATR funds, using the 15 selected standards (Appendix 1). It will be presented like the Reports on the Observance of Standards and Codes (ROSCs), conducted by the IMF member countries.</td>
</tr>
</tbody>
</table>
Chapter Four: An Examination of the Equalization Function of CATR

Background

This chapter focuses on the equalization function of Taiwan’s revenue sharing program, the Centrally-Allotted Tax Revenue (CATR). This program had an institutional transformation in 2000 due to governmental reform at the end of 1998. The most significant feature of the transformation is that it began to use formulas to guide fund distribution, whereas previously, the distribution had been fully dependent on a higher-level government’s discretionary decision. This chapter explores how the institutional transformation has affected the equalization function of this program.

There were four levels of government in Taiwan before 1999: the national government, the municipal and provincial governments, county and city governments, which were subordinate to the provincial governments, and townships. At the end of 1998, the provincial government became a consultant institution, and all authority was taken away in accordance with an amendment of Taiwan’s constitution. County and city level governments became directly subordinate to the national government. An important regulation change, the 1999 amendment of the *Allocation Law of Government Revenues and Expenditures* (the *Allocation Law*), reassigned responsibilities and reallocated resources among different levels of governments. Responsibilities were shifted from the provincial governments to county and city governments; however, only some of the corresponding resources were transferred to them. The reallocation of government revenue was accompanied by the allotted tax revenue program reform.
The allotted tax revenue program was legally justified on the grounds that it shifted resources from richer to poorer jurisdictions. This was considered a purely redistributive transfer program, and was operated by the provincial governments. It was first approved by the legislature in 1951 as the Provincially-Allotted Tax Revenue (PATR) program, a discretionary transfer program governed by the Taiwan Provincial Government. The removal of authority from the Taiwan Provincial Government at the end of 1998 affected the PATR program. Changes in this program since fiscal year 2000 include the following:\textsuperscript{33} First, the PATR program was replaced by the CATR program, which was an allotted tax revenue program between the national government and municipal and provincial governments from 1981 to 1999. Second, the distribution of CATR funds has a legal foundation — the \textit{Distribution Regulation of Centrally-Allotted Tax Revenue (Distribution Regulation)}, effective since 2000. According to the \textit{Distribution Regulation}, the distribution of CATR funds would be based on formulas rather than discretionary decisions. This chapter focuses on the equalization function of this program and examines research question one:

\begin{quote}
Do CATR funds target poorer regions, i.e., does the use of a distribution formula improve fiscal balance, compared to the discretionary distributions made through political negotiations?
\end{quote}

Current literature suggests that formula driven transfer programs are more likely to improve interregional equalization than discretionary transfers (Bahl & Linn, 1994; Boadway & Shah, 2006; Grossman, 1994; Inman, 1989; A. Worthington & Dollery, 1989).

\textsuperscript{33} The provincial level government was removed from Taiwan’s governmental apparatus at the end of 1998. Fiscal year 1999 ran from July 1998 through June 1999. Therefore, counties and cities received PATR funds rather than CATR funds in fiscal year 1999. The fiscal year was adjusted to the calendar year (January–December) in fiscal year 2000, which is composed of 18 months — from July 1999 to December 2000. The new CATR program was implemented in fiscal year 2000.
Theoretically, discretionary transfers create incentives for local governments to take advantage of the non-transparent distribution process and negotiate for more transfers. As a result, jurisdictions with greater potential political capital often receive more; this result is consistent with the public choice theories that the grant process is a political rather than an equalization process (Alperovich, 1984; Faith, 1979; Grossman, 1994; Leyden, 1992; Rich, 1989; Tekeli & Kaplan, 2008). In contrast, formula-based transfer programs are transparent and predictable, and are confirmed to facilitate interregional equalization by eliminating political negotiations (Louis, Jabine, & Gerstein, 2003).

**Overview of This Chapter**

Research question one is answered through three sub-questions:

First, “How does the current CATR program operate?” Responses to this question offer an understanding of the current CATR program, how it was implemented, how the distribution is made, and what factors determine the distribution. This background knowledge provides information that facilitates the analyses for the following two empirical questions. Through the description of the implementation of CATR program, current issues within this program may also be identified.

Second, “Does the formula-driven CATR program reduce fiscal disparity more than the discretionary PATR program?” Responses to this question provide direct evidence of the effectiveness of the formula-based program regarding inter-jurisdictional equalization.

Third, “Does the current distribution formula take demand and poverty into consideration?” Theoretically, formula-driven transfer programs provide a more transparent and stable distribution process than discretionary programs, but they do not
necessarily produce a more equitable distribution among recipients unless the formula is fully objective and that differences in fiscal capacity are adjusted for expenditure needs (Ma, 1997). Khemani (2004) also indicates that the distribution formula may involve political factors that favor regions with greater political capital, as well. Therefore, responses to this question depict the reality of distribution results of the formula-driven CATR program.

As previously stated, this chapter is organized around the above three sub-questions of research question one. The unit of analysis is all second level jurisdictions but Chin-men and Lian-chiang counties, including municipalities and counties (cities). The first sub-question involves only the current distribution process. The second sub-question involves the improvement, if any, of fiscal disparity as a result of the CATR program’s transformation; therefore, the data cover fiscal years 1992-2007. The third question involves only the current distribution result, and the data range from fiscal year 2000 to 2007.

Seven managerial level officials from local divisions of finance were invited to participate in semi-structured interviews with the open question: “Could you please tell me the positives and negatives of the current CATR program?” The interviewee codes are from No. 7 to No. 13. Interviews provide information about the implementation of the current CATR and current issues on this program. Official data were collected and transferred into measurable variables to examine the second and third empirical questions. Fiscal data are drawn from local annual audited final account reports, while personnel expenses for the period 1992-1998 were from annual final account reports. Demographic data are available on the Taiwan national statistics website. Local jurisdictions receive
two kinds of CATR funds: the general and the special CATR funds, which will be introduced below. The estimated general CATR receivables are reported in the annual budget reports, while the received special CATR funds are in the special budget reports. Annual final account reports and annual audited final account reports include both received general and special CATR funds, and there is no difference between the two on the reports. The analyses in the chapter use CATR funds on annual audited final account reports, which are the total general and special CATR funds a jurisdiction receives.

How Does the Current CATR Program Operate

According the Distribution Regulation of the Centrally-Allotted Tax Revenue (Distribution Regulation), the CATR funds are allocated to local jurisdictions first by ratio to municipalities, counties (cities), and townships, and then by formulas to places within each of them.

Distribution Ratios

CATR funds are distributed from the national government to local governments based on fixed ratios to municipalities, counties (cities), and townships. The funding pool of municipalities comprises 43% of the total CATR funding pool, the funding pool of counties (cities) is 39%, the funding pool of townships is 12%, and the remaining 6% of the total CATR funds are retained by the Ministry of Finance as an emergency reserve. Funds that are distributed on a regular basis are called the general CATR funds. The 6%

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34 The ratios of the first year of new CATR program are 47% to municipalities, 35% to counties (cities), and 12% to townships.
emergency reserve is termed the special CATR fund, and is used at the national
government’s discretion.\textsuperscript{35}

Allocating ratios are not determined by objective formulas and standards, but rather
they reflect local government’s historical shares of total sales tax collections before 2000.
In particular, they reflect the loss of sales tax collections of municipal governments due to
the 1999 amendment of the \textit{Allocation Law}, which shifted sales tax authority from
municipal and provincial governments up to the national government. Municipal
governments previously reserved 50\% of sales tax collections as their own source
revenue; the current 43\% of CATR funds may not make up their losses. County (city)
governments received 50\% of sale tax collected by the provincial government; the current
39\% is much lower.\textsuperscript{36}

The CATR program is designed to improve equalization by subsidizing poorer regions.
The distribution ratios reflect both the compensation of losses of sales tax revenue and
the distribution figures of the old ATR program. One of the interview participants
(Interviewee No. 13) indicated that the distribution ratio is more of a political concern
than an equalization concern: “The distribution of CATR funds is not related to fairness
or equalization, since municipal governments are, in fact, two small counties, but receive
43\% of the total CATR funds.”\textsuperscript{37} There is an ongoing policy issue in Taiwan about
whether or not municipal governments should share 43\% of the total CATR funds.
Opponents claim that there should be no difference between municipal and county (city)
governments in terms of CATR distribution since “after the removal of the provincial

\textsuperscript{35} Only municipalities and counties (cities) can apply for special CATR funds, but municipalities usually do not apply.
\textsuperscript{36} Please see Figure 2 for the structure of PATR funds from 1981 to 1999.
\textsuperscript{37} Taipei County upgraded to a semi-municipality in 2008 and joined the 43\% divisible pool.
level, all counties (cities) were actually municipalities” (Kuo, Wen-Chen, Legislator of Kauhsiung M., The Legislative Yuan Bulletin, No. 98:1). Proponents claim that municipal governments contribute more to the CATR funding pool than counties (cities), and therefore guarantees for more CATR funds should be made. In fact, one municipal division of finance official (Interviewee No. 8) admitted that the use of fixed ratios has distorted the spirit of CATR program. This official also stated, “We will not give up our entitlements, and we will ask for more CATR funds after Taipei County joins our division pool. This [the demand for more funds] is necessary.”

**Distribution Formulas**

Distribution ratios may be an obstacle to inter-jurisdictional equalization between municipalities and counties (cities). The distribution formula may be another issue since there exist apparent fiscal disparities across the 21 counties (cities), as well. The distribution formula for counties (cities) is different than the formula for municipalities. The formulas are as follows:

**Municipality Formula**

According to Article 8 of the latest Allocation Laws, the formula components used to distribute CATR funds to jurisdictions within municipal governments include:

\[
\begin{align*}
(1) & \quad \frac{\text{3-year average of business sales of municipality } k}{\text{3-year average of business sales of all municipalities and semi-municipality}} \\
(2) & \quad \frac{\text{year-end population of municipality } k}{\text{year-end population of all municipalities and semi-municipality}} \\
(3) & \quad \frac{\text{land area of municipality } k}{\text{total land area of all municipalities and semi-municipality}} \\
(4) & \quad \text{3-year average financial capability of municipality } k
\end{align*}
\]
Setting that $A =$ per capita self-financing revenue of all municipalities, $Ak$ is the value in municipality $k$.

Setting that $Bk = (\text{year} - \text{end population of municipality } k) * A/A_k$

and $B$ is the total value of all municipalities

Financial capability of municipality $k = B_k / B$

The estimated general CATR receivable of municipality $k =$

Total General CATR * 43% * (50% * (1) + 20% * (2) + 20% *(3) + 10% * (4))

**County (City) Formula**

According to Article 9 of the latest Allocation Laws, the formula used to calculate the distributing weights to each county (city) comprises the following factors:

\[
(5) \quad \frac{3-\text{year average of (basic financial need} - \text{basic financial revenue}) \text{ of county } j}{3-\text{year average of (basic financial need} - \text{basic financial revenue}) \text{ of all counties } \text{(cities})}
\]

Basic financial needs of a county are the sum of three indicators, while financial needs of a city are **1.15 times** the sum of the three indicators. The indicators are:

(a) Personnel expenses of formal civil servants and basic office expenses, and overtime payments of formal police officers and firefighters;

(b) Social welfare expenses that should be supported by county (city) budgets;

(c) Expenses of infrastructure.

Basic financial revenue is defined as county (city) total tax revenue subtracted by CATR revenue and discretionary tax revenue levied in accordance with the General Act of Local Tax Laws.  

\[
(6) \quad \frac{\text{recent year business sales of county } j}{\text{recent year business sales of all counties } \& \text{cities}}
\]

---

38 CATR revenue is considered as county (city) own source revenue and is categorized as tax revenue in county (city) budget and audit reports.
The estimated CATR receivable of county \( j \) =

\[
\text{Total General CATR} \times 39\% \times (85\% \times (5) + 15\% \times (6))
\]

The grant formula is meant to be simple and easily understood by legislators and taxpayers (Kitchen, 2006), but CATR allocation formulas are complicated. Although Kitchen (2006) indicates that an equalization transfer program justified on fiscal capacity and expenditure needs usually has more complicated distribution formulas, it should at least be made relatively simple to the practitioners. However, DOF managerial officials claim that the grant amount is not easily estimated and predicted. The primary reason is that the national government decides the formula components, and the calculation of each formula component changes frequently:

The CATR is estimated by the national government. We are not sure what amount we will receive until the national government informs us. It is not easy to predict, either. The national government revises the definitions of basic financial needs often. For example, they have revised the definition of formal civil servants, and they also revised the definition of infrastructure.

—Interviewee No. 10

**Distribution Process and Issues**

The agency of the national government, the Ministry of Finance (MOF), holds an annual meeting mid-year and invites municipalities, counties and cities to discuss the distribution of the CATR funds for the following year. The MOF also addresses the amendments of the *distribution regulation* during the meeting. Local DOFs and departments of budget, accounting, and statistics (DBAS) usually argue for more funds in the meeting, while final decisions are made by the MOF based on the *distribution regulation*. 
The CATR receivables are announced to each jurisdiction four months before the start of the next fiscal year. General CATR funds are distributed to each jurisdiction through monthly payments. In contrast, distribution of special CATR funds is at MOF’s discretion based on applications for emergent needs from counties and cities.

Bahl & Linn (1992) argued that a well-designed formula-based revenue sharing program should contain three important traits: objectiveness, stableness, and transparency, and that special CATR funds violate objectiveness and transparency principles. The special CATR funds are criticized as a control on local finances from the national government. An interview participant from a local DOF stated:

Six percent is absolutely smaller than 100%. You can say the new program returns autonomous power to local governments compared to the old one... but it is still problematic that they [the national government] have 6% in hand, and can anyone figure out why they need 6% of our money? After all, there are other forms of grants to deal with local governments’ emergent needs.

—Interviewee No. 9

In the legal framework, the national government is merely responsible for distributing CATR funds based on the allocation ratios and the above-presented formulas. In practice, the national government (MOF) is proactive in determining county (city) receivables.

Eighty-five percent of county (city) CATR distribution is determined by the differences between basic financial needs and basic financial revenue, and the empirical investigation found that the regulation has been amended almost every year since it was enacted in 2000. Further, some of the amendments are related to basic financial needs/revenue redefinition. Under these circumstances, the merit of predictability is not upheld, though the transparency merit is in general secured. The lack of predictability of CATR funds makes it difficult for local governments to prepare for long-term financial plans. It is

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39 The amendments of the Distribution Regulation are minor and incremental, but the frequency of amendments is considered too high by interviewees.
quite possible that definitions of basic financial needs and basic financial revenue involve political factors and favor regions with more political capital. The analyses in the following chapters explore this further.

Finally, the distribution formula for counties (cities) is composed of the relative size of the shortage of basic financial needs and the relative size of local business sales. The shortage component could be a good indicator of equalization, but the component of business sales is likely to favor richer jurisdictions. The official explanation of the inclusion of business sales in the distribution is to take “contribution” into consideration, since business sales tax comprises nearly 40% of the CATR funding pool. However, the CATR program is justified on the grounds of equalization rather than contribution, so the business sales variable is likely to be irrelevant to the goal of the program.

**Regionally Fiscal Disparity: Discretionary vs. Formula-based Distribution**

The question “Does the formula-driven CATR reduce fiscal disparity more than the discretionary transfer?” is interesting because recent literature claims that a formula-driven transfer programs functions better for equalization than a discretionary one (Bahl & Linn, 1994; Boadway & Shah, 2006; Inman, 1998; Khemani, 2004; Rodden, 2003; A. Worthington & Dollery, 1998). A quantitative longitudinal study conducted in Taiwan examined if the Taiwanese case corresponds to the current literature arguments. The hypothesis set in this section is: *Introducing formulas to distribute CATR funds helps to reduce more inter-jurisdictional fiscal disparity than using discretionary distribution.*

The examinations of this hypothesis use two disparity measurements, correlations of variations and maximum to minimum ratios, to compare the degree of disparity between the periods of 1992-1999 and 2000-2007. Three indicators, *affordability, non-basic*
expenditures \((NBE)\), and self-raised revenue \((SR)\) were transferred to disparity measurements.

Coefficients of variations \((CV)\) are used to quantify the dispersions of the above-mentioned three variables. Maximum to minimum ratios \((MMR)\) are employed to provide information about the degree of perfect equity of the three indicators. These two disparity indicators are widely used in the literature on regional equalization (Richard M. Bird \& Tarasov, 2004; Shankar \& Shah, 2001).

Affordability measures the ability of local governments to support their personnel expenses with their own tax revenue.\(^{40}\) Affordability \(\geq 1\) implies the jurisdiction’s personnel expense is fully afforded by own source revenue. Affordability \(< 1\) indicates that tax revenue alone cannot support local personnel expenses. Statistical descriptions of affordability of jurisdictions are presented in Table 11 by place and Table 12 by year.

The \(NBE\) indicator measures local expenditures for non-basic financial needs. Although the CATR program is justified on securing local basic public services, there are some concerns about the appearance of insufficient funds — local jurisdictions may allocate CATR funds to \(NBE\) to increase their financial shortage to pursue more CATR funds. Spahn (2006) stated, “recipient agents may be able to manipulate the criteria to maximize grants while failing to achieve the desired objectives” (p. 76). The measure of \(NBE\) provides a comparative base for affordability — for example, if affordability does not achieve inter-jurisdictional balance but \(NBE\) does, it may be possible that the appearance ruse is being used. The statistical descriptions of \(NBE\) are in Table 13 by county (city) and Table 14 by year.

\(^{40}\) Local own tax revenue includes the received CATR funds.
The third indicator used to generate regional disparity measurement is locally self-raised revenue ($SR$), defined as total general revenue subtracted by all intergovernmental transfers. $SR$ are resources that can be controlled by local governments themselves. The *Local Tax Act*, enacted in 2002, authorized local government taxation powers; however, they are limited. Indicator $SR$ provides information on the willingness of local governments to increase tax efforts, since extra CATR funds in general are not available once the final receivable has been determined.\(^4\) The statistical descriptions of $SR$ are presented in Table 15 by county (city) and Table 16 by year.

To articulate the analysis, the sample is distinguished by Group 1, which covers all municipalities, counties, and cities, and Group 2, which excludes municipalities. CV1 and MMR1 show the results of CVs and MMRs in Group 1, and CV2 and MMR2 reflect CVs and MMRs in Group 2. In addition, in order to specify the influences of CATR transformation, sample years were separated into time 1 (T1): 1992-1999, the period that the old allotted tax revenue program was in place; and time 2 (T2): 2000-2007, the new CATR program period.

Data Information

Tables 10-15 present the descriptive statistics of the three indicators. Only six jurisdictions are able to support their personnel expenses by own tax revenue, while 11 jurisdictions have not been able to pay for their formal civil servants through this resource for 16 years. Taipei Municipality takes the lead on *affordability* (1.85), while Penghu County’s tax revenue is only about half of their personnel expenditure (0.54). The

\(^4\) The special CATR funds are available for counties and cities to apply for emergency use, but the final decision is made by the MOF. Special CATR funds are not county (city) entitlements.
maximum value of *affordability* is 2.57, reflecting the information of Taipei Municipality in 1992; the minimum value is 0.42, reflecting Penghu County in 2004.

In the context of affordability, cities and municipalities have relatively sufficient resources compared to counties. A city is considered at the township level in Taiwan’s governmental structure, but those with a greater population and higher political, economic, and cultural importance are considered county level governments.\(^{42}\) In general, municipalities and cities have a higher population density than counties, and this statistical characteristic of affordability implies population, population density, or land area may have an impact on regional disparity. Taipei Municipality, Taipei County, and Taichung City have variance values larger than 10, suggesting that these three jurisdictions have had large changes in their affordability during the 16 years. Table 12 demonstrates the statistic feature of the *affordability* by year. *Affordability* had higher values in the earlier years, as well as higher variances.

Table 14 indicates that *NBEs* were larger in the recent years, but had a low point in 2000, recorded as $9.44 per capita.\(^{43}\) Table 13 shows that average *NBE* ranged from $5.51 (Changhua County) to $24.52 (Taipei Municipal) per capita. Taipei Municipality, Penghu County, and Kaohsiung Municipality led *NBEs* among the 23 jurisdictions, and their variance values were also higher than other jurisdictions. Taoyuan and Chanhua never reached double-digit per capita *NBE* during the 16 years, and Chanhua had the lowest average *NBE*. Taipei County had a minimum per capita *NBE* of $3.29 in 1992, primarily due to a significant increase in environmental protection capital expenditures ($3.4 million) that year. Taipei Municipality had a maximum per capita *NBE* of $38.54 in

\(^{42}\) The Local Government Act of 1999 indicates that cities with a population more than 500,000 may apply for an upgrade to a county-level city.

\(^{43}\) Per capita here indicates per 1,000 people.
1998, but this simply reflects owed payments. When taking population into consideration, cities were not particularly dominant over counties.

As shown in Table 15, average per capita SRs ranged from $5.79 (Pingtung) to $47.21 (Taipei Municipality). Again, municipalities led this indicator, and also had the largest variances among all jurisdictions. Large variances of per capita SR can be explained by the 1999 amendment of the Allocation Law, which shifted sales tax authority from municipal and provincial governments to the national government. Sales tax used to be the single largest tax revenue item for municipal jurisdictions, and the removal of this tax authority led to a significant decrease of their SRs. In general, cities have better SR figures than counties, and all agricultural jurisdictions have per capita self-raised revenue less than $10. This may imply that the local tax structure disfavors agriculturally based counties. Table 16 indicates that average SRs did not have higher values in recent years, but variances were much smaller than early years.
Table 11: Affordability, by Jurisdiction, 1992-2007

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taipei</td>
<td>1.01</td>
<td>0.32</td>
<td>0.10</td>
<td>0.61</td>
<td>1.72</td>
</tr>
<tr>
<td>Yilan</td>
<td>0.70</td>
<td>0.07</td>
<td>0.01</td>
<td>0.62</td>
<td>0.90</td>
</tr>
<tr>
<td>Taoyuan</td>
<td>0.94</td>
<td>0.20</td>
<td>0.04</td>
<td>0.63</td>
<td>1.49</td>
</tr>
<tr>
<td>Hsinchu</td>
<td>0.79</td>
<td>0.11</td>
<td>0.01</td>
<td>0.61</td>
<td>0.98</td>
</tr>
<tr>
<td>Miai</td>
<td>0.72</td>
<td>0.06</td>
<td>0.00</td>
<td>0.59</td>
<td>0.80</td>
</tr>
<tr>
<td>Taichung</td>
<td>0.77</td>
<td>0.10</td>
<td>0.01</td>
<td>0.65</td>
<td>1.09</td>
</tr>
<tr>
<td>Changhua</td>
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<td>0.07</td>
<td>0.00</td>
<td>0.61</td>
<td>0.84</td>
</tr>
<tr>
<td>Nantou</td>
<td>0.75</td>
<td>0.17</td>
<td>0.03</td>
<td>0.57</td>
<td>1.17</td>
</tr>
<tr>
<td>Yunlin</td>
<td>0.72</td>
<td>0.06</td>
<td>0.00</td>
<td>0.63</td>
<td>0.83</td>
</tr>
<tr>
<td>Chia-I</td>
<td>0.72</td>
<td>0.12</td>
<td>0.01</td>
<td>0.56</td>
<td>0.93</td>
</tr>
<tr>
<td>Tainan</td>
<td>0.81</td>
<td>0.11</td>
<td>0.01</td>
<td>0.64</td>
<td>1.00</td>
</tr>
<tr>
<td>Kaohsiung</td>
<td>0.81</td>
<td>0.18</td>
<td>0.03</td>
<td>0.58</td>
<td>1.24</td>
</tr>
<tr>
<td>Pingtung</td>
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<td>0.10</td>
<td>0.01</td>
<td>0.57</td>
<td>0.97</td>
</tr>
<tr>
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<td>0.11</td>
<td>0.01</td>
<td>0.48</td>
<td>0.86</td>
</tr>
<tr>
<td>Hualien</td>
<td>0.69</td>
<td>0.11</td>
<td>0.01</td>
<td>0.53</td>
<td>0.90</td>
</tr>
<tr>
<td>Penhu</td>
<td>0.54</td>
<td>0.12</td>
<td>0.01</td>
<td>0.41</td>
<td>0.81</td>
</tr>
<tr>
<td>Keelung C.</td>
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<td>0.06</td>
<td>0.00</td>
<td>0.57</td>
<td>0.78</td>
</tr>
<tr>
<td>Hsinchu C.</td>
<td>1.06</td>
<td>0.15</td>
<td>0.02</td>
<td>0.83</td>
<td>1.37</td>
</tr>
<tr>
<td>Taichung C.</td>
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<td>0.31</td>
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</tr>
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<td>0.72</td>
<td>1.27</td>
</tr>
<tr>
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<td>1.00</td>
<td>0.24</td>
<td>0.06</td>
<td>0.70</td>
<td>1.59</td>
</tr>
<tr>
<td>Taipei M.</td>
<td>1.85</td>
<td>0.40</td>
<td>0.16</td>
<td>1.33</td>
<td>2.57</td>
</tr>
<tr>
<td>Kaohsiung M.</td>
<td>1.28</td>
<td>0.16</td>
<td>0.03</td>
<td>1.06</td>
<td>1.59</td>
</tr>
</tbody>
</table>

Definition: Ratio of county (city) tax revenue to personnel expenses.
Note: This is not a percentage.
Source: Audited final account reports from each county and city with author’s calculations.
### Table 12: Affordability by Year, for 23 Jurisdictions

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>1.12</td>
<td>0.52</td>
<td>0.27</td>
<td>0.49</td>
<td>2.57</td>
</tr>
<tr>
<td>1993</td>
<td>1.03</td>
<td>0.45</td>
<td>0.20</td>
<td>0.50</td>
<td>2.45</td>
</tr>
<tr>
<td>1994</td>
<td>0.97</td>
<td>0.39</td>
<td>0.15</td>
<td>0.50</td>
<td>2.27</td>
</tr>
<tr>
<td>1995</td>
<td>0.92</td>
<td>0.39</td>
<td>0.15</td>
<td>0.48</td>
<td>2.24</td>
</tr>
<tr>
<td>1996</td>
<td>0.86</td>
<td>0.28</td>
<td>0.08</td>
<td>0.57</td>
<td>1.92</td>
</tr>
<tr>
<td>1997</td>
<td>0.94</td>
<td>0.26</td>
<td>0.07</td>
<td>0.63</td>
<td>1.96</td>
</tr>
<tr>
<td>1998</td>
<td>0.83</td>
<td>0.33</td>
<td>0.11</td>
<td>0.53</td>
<td>2.15</td>
</tr>
<tr>
<td>1999</td>
<td>0.87</td>
<td>0.30</td>
<td>0.09</td>
<td>0.64</td>
<td>2.07</td>
</tr>
<tr>
<td>2000</td>
<td>0.83</td>
<td>0.22</td>
<td>0.05</td>
<td>0.66</td>
<td>1.69</td>
</tr>
<tr>
<td>2001</td>
<td>0.71</td>
<td>0.20</td>
<td>0.04</td>
<td>0.52</td>
<td>1.42</td>
</tr>
<tr>
<td>2002</td>
<td>0.74</td>
<td>0.20</td>
<td>0.04</td>
<td>0.47</td>
<td>1.34</td>
</tr>
<tr>
<td>2003</td>
<td>0.72</td>
<td>0.20</td>
<td>0.04</td>
<td>0.43</td>
<td>1.33</td>
</tr>
<tr>
<td>2004</td>
<td>0.78</td>
<td>0.25</td>
<td>0.06</td>
<td>0.41</td>
<td>1.50</td>
</tr>
<tr>
<td>2005</td>
<td>0.82</td>
<td>0.25</td>
<td>0.06</td>
<td>0.44</td>
<td>1.57</td>
</tr>
<tr>
<td>2006</td>
<td>0.82</td>
<td>0.25</td>
<td>0.06</td>
<td>0.45</td>
<td>1.56</td>
</tr>
<tr>
<td>2007</td>
<td>0.86</td>
<td>0.26</td>
<td>0.07</td>
<td>0.51</td>
<td>1.65</td>
</tr>
</tbody>
</table>

**Definition:** Ratio of county (city) tax revenue to personnel expenses.  
**Note:** This is not a percentage.  
**Source:** Audited final account reports from each county and city with author’s calculations.
Table 13: Non-Basic Expenditures (Per Capita) by Jurisdiction, 1992-2007

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taipei</td>
<td>6.59</td>
<td>2.06</td>
<td>4.23</td>
<td>3.29</td>
<td>10.78</td>
</tr>
<tr>
<td>Yilan</td>
<td>11.33</td>
<td>3.53</td>
<td>12.44</td>
<td>5.22</td>
<td>18.02</td>
</tr>
<tr>
<td>Taoyuan</td>
<td>6.74</td>
<td>1.69</td>
<td>2.86</td>
<td>4.26</td>
<td>9.97</td>
</tr>
<tr>
<td>Hsinchu</td>
<td>10.71</td>
<td>2.82</td>
<td>7.96</td>
<td>6.48</td>
<td>16.52</td>
</tr>
<tr>
<td>Miaoli</td>
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<td>2.70</td>
<td>7.28</td>
<td>5.75</td>
<td>15.78</td>
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<tr>
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<td>3.15</td>
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<td>12.55</td>
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<tr>
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<td>8.27</td>
</tr>
<tr>
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<td>24.58</td>
<td>6.61</td>
<td>22.00</td>
</tr>
<tr>
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<td>4.17</td>
<td>6.16</td>
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<td>Chia-I</td>
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<td>1.95</td>
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</tr>
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<td>2.03</td>
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</tr>
<tr>
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<td>7.10</td>
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<td>18.50</td>
</tr>
<tr>
<td>Hualien</td>
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<td>3.16</td>
<td>9.97</td>
<td>7.21</td>
<td>17.94</td>
</tr>
<tr>
<td>Penhu</td>
<td>23.33</td>
<td>5.37</td>
<td>28.80</td>
<td>15.26</td>
<td>33.90</td>
</tr>
<tr>
<td>Keelung C.</td>
<td>11.75</td>
<td>3.14</td>
<td>9.87</td>
<td>5.97</td>
<td>16.94</td>
</tr>
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<td>5.84</td>
<td>22.48</td>
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<td>2.95</td>
<td>8.71</td>
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</tr>
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</tr>
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<td>29.89</td>
<td>12.89</td>
<td>34.21</td>
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</tbody>
</table>

Definition: Total County (City) Expenditures on Non-Basic Needs. Numbers are in dollars ($).

Note:
1. Per capita figures are expressed per 1,000.
2. Past dollars were inflated to 2007 dollars.
3. NBEs in fiscal year 2000 are adjusted to 12-month values by dividing the original numbers by 1.5.

Source: Audited final account reports from each county and city with author’s calculations.
Table 14: Non-Basic Expenditures (Per Capita) by Year, for 23 Jurisdictions

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
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<td>5.01</td>
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<td>24.56</td>
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<td>3.89</td>
<td>29.92</td>
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<tr>
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<td>5.10</td>
<td>25.96</td>
<td>4.77</td>
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</tr>
<tr>
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<td>6.58</td>
<td>43.25</td>
<td>4.83</td>
<td>33.90</td>
</tr>
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<td>6.72</td>
<td>45.10</td>
<td>5.61</td>
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</tr>
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<td>4.74</td>
<td>22.45</td>
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</tr>
<tr>
<td>2007</td>
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<td>5.17</td>
<td>26.77</td>
<td>5.52</td>
<td>28.09</td>
</tr>
</tbody>
</table>

Definition: Total county (city) expenditure on non-basic needs. Numbers are in dollars ($).

Note:
1. Per capita figures are expressed per 1,000.
2. Past dollars were inflated to 2007 dollars.
3. NBEs in fiscal year 2000 are adjusted to 12-month values by dividing the original numbers by 1.5.

Source: Audited final account reports from each county and city with author’s calculations.
Table 15: Self-raised Revenue (Per Capita) by Jurisdiction, 1992-2007

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.42</td>
<td>8.92</td>
<td>14.44</td>
</tr>
<tr>
<td>Yilan</td>
<td>7.54</td>
<td>1.89</td>
<td>3.58</td>
<td>4.68</td>
<td>11.25</td>
</tr>
<tr>
<td>Taoyuan</td>
<td>11.49</td>
<td>1.42</td>
<td>2.02</td>
<td>8.76</td>
<td>14.10</td>
</tr>
<tr>
<td>Hsinchu</td>
<td>10.34</td>
<td>1.65</td>
<td>2.73</td>
<td>7.98</td>
<td>13.96</td>
</tr>
<tr>
<td>Miali</td>
<td>7.12</td>
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<td>1.75</td>
<td>5.35</td>
<td>9.30</td>
</tr>
<tr>
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<td>0.92</td>
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<td>9.44</td>
</tr>
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<td>0.96</td>
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<td>8.03</td>
</tr>
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<td>1.64</td>
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</tr>
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</tr>
<tr>
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<tr>
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<tr>
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<td>12.85</td>
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<td>1.30</td>
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<td>0.89</td>
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<td>20.17</td>
<td>33.74</td>
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</tbody>
</table>

Definition: Total county (city) self-raised tax and other revenue. Numbers are in dollars ($).

Note:
1. Per capita figures are expressed per 1,000.
2. Past dollars were inflated to 2007 dollars.
3. NBEs in fiscal year 2000 are adjusted to 12-month values by dividing the original numbers by 1.5.

Total revenue excludes borrowing and surplus prior year funds.

Source: Audited final account reports from each county and city with author’s calculations.
Table 16: Self-raised Revenue (Per Capita) by Year, for 23 Jurisdictions

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
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</thead>
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<td>55.88</td>
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<td>14.64</td>
<td>214.26</td>
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<td>71.84</td>
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<td>55.94</td>
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<td>7.34</td>
<td>53.95</td>
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<td>37.98</td>
</tr>
</tbody>
</table>

Definition: Total county (city) self-raised tax and other revenue. Numbers are in dollars ($).

Note:
1. Per capita figures are expressed per 1,000.
2. Past dollars were inflated to 2007 dollars.
3. NBEs in fiscal year 2000 are adjusted to 12-month values by dividing the original numbers by 1.5.

Total revenue excludes borrowing and surplus prior year funds.

Source: Audited final account reports from each county and city with author’s calculations.
**Results: Coefficients of Variations**

CV results are presented in Table 17. Trends of *affordability* are depicted in Figure 4, *NBE* in Figure 5, and *SR* in Figure 6. CV measures the \( \sigma \) convergence, which is a dispersion measurement. It takes values between 0 and infinity. Empirically, a small CV implies a less dispersive distribution; CV > 1 is considered high-variance or less convergence. In the context of inter-jurisdictional disparity, a larger CV indicates a higher degree of disparity. The primary drawback of CV is the lack of absolute standards (or critical values) to define acceptable values for specific measurements. As this dissertation simply aims to find the changes caused by the transformation of the CATR program, relative CV values are more important than absolute values. The dynamic trend of CV toward smaller values implies the tendency toward \( \sigma \) convergence, and vice versa.

**Table 17: Coefficients of Variations**

<table>
<thead>
<tr>
<th>Year</th>
<th>Affordability</th>
<th>NBE</th>
<th>SR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CV1</td>
<td>CV2</td>
<td>CV1</td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
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<td>0.41</td>
<td>0.65</td>
</tr>
<tr>
<td>1993</td>
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<td>0.44</td>
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<td>0.49</td>
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<td>0.42</td>
<td>0.27</td>
<td>0.41</td>
</tr>
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<td>0.39</td>
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<td>0.19</td>
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</tr>
<tr>
<td>1999</td>
<td>0.34</td>
<td>0.13</td>
<td>0.51</td>
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<tr>
<td>Time 2</td>
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<td></td>
</tr>
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<td>0.62</td>
</tr>
<tr>
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<td>0.43</td>
</tr>
<tr>
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<td>0.19</td>
<td>0.53</td>
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<tr>
<td>2003</td>
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<td>0.43</td>
</tr>
<tr>
<td>2004</td>
<td>0.32</td>
<td>0.25</td>
<td>0.48</td>
</tr>
<tr>
<td>2005</td>
<td>0.31</td>
<td>0.23</td>
<td>0.50</td>
</tr>
<tr>
<td>2006</td>
<td>0.30</td>
<td>0.22</td>
<td>0.38</td>
</tr>
<tr>
<td>2007</td>
<td>0.30</td>
<td>0.22</td>
<td>0.39</td>
</tr>
</tbody>
</table>

\( H_0: T1 \leq T2, p\text{-value} \)

|     | 0.01 | 0.21 | 0.21 | 0.07 | <0.01 | <0.01 |
Affordability

The variable *affordability* is directly related to the equalization function of the CATR program. The quantitative result shows that, in the long run, the dispersive degree of the interregional *affordability* shows a declining trend. As presented in Table 17, the *affordability* has higher coefficient variations in T1, with the exception of fiscal year 1997, where CV was recorded at 0.28. CVs in T2 (0.27 - 0.32) were generally lower than values in T1 (0.27 - 0.47). The first four years of the new CATR program (2000-2004) demonstrated significant improvement of inter-jurisdictional balance (0.27 - 0.28), while CVs rose to 0.32 and dropped to 0.28 or below until 2007. A statistical t-test was applied to examine if CV\(_{T2}\) was significantly lower than CV\(_{T1}\). The test shows that the null hypothesis \(H_0: \text{coefficients of variations of } T1 \text{ are equal to coefficients of variations of } T2, \text{ or } \mu_{T1} = \mu_{T2}\) was rejected at the 98% confidence level (p-value = 0.01). This result shows that the interregional disparity was smaller after year 2000.

As presented in the Table 11, Taipei M. and Kaohsiung M. led *affordability* over the 23 jurisdictions. Since municipal governments were a level higher than counties and cities before fiscal year 2000,\(^{44}\) they may have had more own source revenue than counties and cities. For example, municipalities reserved 50% of the sales tax collection as own source revenue, while the 21 counties and cities shared 50% of sales tax collected by the Taiwan Provincial Government. CV2 takes the above situation into consideration and CV2 in Table 17 and Figure 4 presents the CVs of *affordability* of 21 counties and cities only. Removing extreme values decreases coefficients of variations, but the more

\(^{44}\)Municipal governments have been considered second level governments in Taiwan’s governmental structure. Its administrative status was the same as the provincial governments, the direct supervisors of county and city governments. The removal of provincial governments in late 1999 upgraded counties and cities to second level governments in the context of administration, although the constitution considers them lower than municipalities.
important finding is that the impact of CATR transformation seems to be temporary or accidental. The CVs had a large drop from 1999 to 2000, increased from 2001 through 2004, then slightly decreased again from 2005 through 2007. The statistical t-test shows that CV2 on T1 is not significantly different from CV2 in T2 (p-value = 0.21).

Non-Basic Expenditures

\( NBE \) provides information about the change in local spending on non-CATR targeted expenditures, which are defined as expenditures that are not considered in the distribution formula. Although it is true that some jurisdictions have not been able to pay for personnel expenses using their own tax revenue, there also exists the possibility that jurisdictions do not make “basic financial needs” their priority spending in order to amplify financial shortages and pursue more CATR funds.

Table 17 shows that the coefficients of variation of \( NBE \) of 23 jurisdictions showed an inconsistent pattern over the 16 years, and the significance test indicated that CVs of T1
and T2 are not different (p-value = 0.41). Further, changes of CVs tended to be a 
*correction* process: a high CV always followed by a low CV, and vice versa.

On the other hand, results on CV2 indicate that the disparity becomes more serious in 
T2 than in T1 (p-value = 0.07). Since the equalization of *affordability* is not achieved and the 
disparity of $NBE$ is larger after fiscal year 2000, it may imply that the county (city) 
distribution formula fails to bring resources to poorer regions. In particular, it implies that 
with the formula-based CATR, some counties (cities) still do not have enough own source 
revenue to support basic personnel expenses, while some jurisdictions have extra funds to 
spend on non-basic expenditures.

*Self-raised Revenue*

This indicator provides information about the efforts local jurisdictions took for 
increasing their own source revenue. The results on CVs of $SR$ indicated that the self-
raised revenue of 23 jurisdictions converged after year 2000. CVs after 2000 were all
below CVs during T1 period, which had three CVs larger than 1. In Figure 3, the large CV drop in 2000 was likely due to the policy change that year. The statistical t-test also lends support that CVs at T2 are significantly smaller than CVs at T1 (p-value < 0.01).

However, the convergence of SR distribution after 2000 could be related to the inclusion of municipal governments in the sample. As previously mentioned, municipal governments retained 50% of sales tax as their own tax revenue, but the 1999 amendment of the Allocation Law removed their sales tax authority and reduced their SR.

Figure 3 indicates that 21 jurisdictions’ CVs converged since 1997. The statistical t-test on the difference between CV2 on T1 and CV2 on T2 shows that the difference is significant (p-value < 0.01). SR is more equalized under the formula-based CATR program. However, it does not necessarily mean that the formula-based CATR encourages tax efforts, since the new tax structure in the 1999 amendment of the Allocation Law has also applied to local governments since fiscal year 2000. The equalized SR could be a result of this new tax structure.

**Figure 6: Coefficient of Variation of SR**

<table>
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<tr>
<th>Year</th>
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</tr>
</thead>
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<tr>
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<tr>
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</tbody>
</table>

Note: CV1 reflects CVs for all 23 jurisdictions; CV2 reflects CVs for 21 counties and cities only.
Results: Maximum to Minimum Ratio (MMR)

Maximum to minimum ratio (MMR) is the most straightforward measurement of regional disparity, but it is also easily influenced by accidental events and extreme values. Therefore, analyzing regional disparity by MMR should consider the long-term trend rather than the short-term effect. MMR is calculated as the ratio of the richest jurisdiction to the poorest one, and as Shankar and Shah (2001) indicated, it provides information on “perfect equity.” MMR can be any value larger than 1, and a higher value of MMR indicates a higher level of regional disparity. Table 18 presents the MMRs for affordability, NBE, and SR; Figures 6-8 depict MMRs of these, respectively.

<table>
<thead>
<tr>
<th>Year</th>
<th>Affordability</th>
<th>NBE</th>
<th>SR</th>
</tr>
</thead>
<tbody>
<tr>
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<td>MMR2</td>
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</table>

H0: T1 ≤ T2, p-value

<table>
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<th>Year</th>
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<th>NBE</th>
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<tbody>
<tr>
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<td>MMR1</td>
<td>MMR2</td>
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Affordability

MMRs of *affordability* reflect the similar pattern of CVs. For all 23 jurisdictions, the ratios were high in the early 1990s, dropped in 1996 and 1997, rose again in 1998, and then lowered in 1999. The lowest MMR appeared in 2000, marked as 2.55 or 255%, and then it rose from 2001 through 2004, and finally lowered from 2005 through 2007. Results on MMRs reveal a smaller disparity in T2 than in T1, although MMRs in 2004 (at 3.68 or 368%) and 2005 (at 3.53 or 353%) are larger than the MMR in 1997 (at 3.11 or 311%). The statistical t-test result lends support that the average MMRs in T2 were lower than average MMRs in T1 (p-value = 0.03). The result suggests that the gap between the jurisdiction with the highest and the lowest *affordability* was smaller after the implementation of the new CATR program.

MMR2 provides evidence that the removal of municipalities from the sample lowered the MMRs for other 21 jurisdiction, because the Taipei Municipality was recorded as the jurisdiction with the highest *affordability* among 23 jurisdictions. However, the impact of new CATR program seemed to disappear when considering only counties and cities. The significance t-test concluded that MMRs in T1 and T2 were not significantly different (p value= 0.55). This finding implied that the formulated CATR did not improve the inter-regional fiscal balance.

Non-Basic Expenditures

In 1998, the richest jurisdiction recorded its *NBE* as 10 times that of the poorest jurisdiction. On the contrary, in 1997, the richest jurisdiction had only 3.9 times *NBE* more than the poorest. However, the changes in MMR showed a correcting process,
and in the long run, there is no downward pattern. The statistical t-test concluded that MMRs in T1 and T2 were not significantly different (p value=0.97). This result showed that jurisdictions did not change their spending priorities to pursue more CATR funds.

Comparing the results of MMR1 and MMR2, the statistical t-test indicated that MMRs in T1 were significantly smaller than MMRs in T2 (p value = 0.05). Smaller MMRs imply a lower level of inter-jurisdictional imbalance, and the comparison of MMR2 between T1 and T2 indicated that the inter-jurisdictional balance on NBE became poorer during the period of new CATR program.

*Self-raised Revenue*

Results on MMRs showed significant diminishing of disparities of SR in T2. The statistical significance test also concluded that MMRs in T2 were significantly smaller.
than they were in T1 (p-value < 0.01). In particular, MMRs were above 10 in T1, but less than 10 in T2. The largest MMR appeared in 1995, when the richest jurisdiction had per capita self-raised revenue that was 18 times greater than the poorest. The lowest MMR was recorded in 2002 at 5.63.

Comparing MMR1 with MMR2, it was found that county and city SR was closer to perfect equity in T2 than when taking all 23 jurisdictions into consideration in T1. The significance test also suggested an average smaller MMR in T2 (p value = 0).

Nevertheless, as stated in the previous section, the reason could also be attributed to the removal of sales tax authority that largely reduced municipalities’ self-raised tax revenue.
Analysis: The Equalization Function of the Current CATR Program

The uses of CV and MMR to measure inter-regional equalization on affordability, NBE and SR were to answer the research question: “Do CATR funds target poorer regions, i.e., does the use of a distribution formula improve fiscal balance compared to the discretionary distribution made through political negotiations?” Taiwan’s CATR program provides an opportunity to facilitate this comparison, since this program was transferred from discretionary to formula-driven in fiscal year 2000. This chapter adopts the perspective established by current literature on equalization grants and argues that a formula-based program is superior to the discretionary one because of its stable, predictable, and transparent process. However, the responses to research question 1a: “How does the current CATR program operate?” have found that the current formula-
driven CATR still does not meet the criteria of stability and predictability, and the
transparency is merely held for the distribution process.

Findings are presented in Table 19. Notations of each term were introduced previously.
T1>T2 indicates a more balanced inter-jurisdictional financial condition for the period of
2000-2007; T1=T2 indicates that the CVs and MMRs have remained unchanged during
the 16 years; T1<T2 suggests a higher level of inter-jurisdictional disparity in the period

**Affordability**

Results on CVs and MMRs imply that the new CATR program made the *affordability*
of municipalities closer to counties (cities), while the equalization function of the county
(city) distribution formula seems ineffective.

*Affordability* is directly related to the effectiveness of the equalization function of the
new CATR program. The results of the CVs and MMRs indicate that implementing a new
CATR program improves the inter-jurisdictional regional balance among the 23
jurisdictions. However, the decline of CVs and MM ratios did not continue. The first four
years of the new CATR program presented significant improvement of inter-regional
equity, but since 2004, CVs and MMRs rose and continued to be high. The previous
section has identified that the current distribution formula relies on the national
government to define basic financial needs/revenue, and these definitions change
frequently. Therefore, the relatively higher CVs of the recent four years (2004-2007) might imply that the basic financial needs/revenue of current years need to be clearly stated and regional differences in financial conditions need to be considered. Local practitioners also suggested that a revision of the formula is necessary to achieve a real inter-regional balance.

The change of CVs and MMRs can be a result of either the decreased affordability in richer jurisdictions or the increased affordability in poorer jurisdictions. The data show mixed findings. Through the statistical t-test, the average affordability for the period 2000-2007 is significantly smaller than the average affordability for the period 1992-1999. The more equalized inter-jurisdictional affordability is primarily due to larger decreases of affordability in richer jurisdictions compared to smaller decreases in poorer jurisdictions. Neither richer nor poorer jurisdictions were better off. Municipalities were found to increase overall inter-regional disparity of affordability because they had better figures of affordability among all 23 jurisdictions. The evidence suggests that CVs and MMRs decrease 20%-50% when the sample excludes municipalities. In contrast, both the CVs and MMRs of 21 counties and cities indicated that the equalization of affordability is not improved over time. The same conclusion has made by one practitioner:

I don’t think we are better off now. Although the receivables have become more transparent, the resources have decreased. Rich counties take advantage of the current formula, while poor counties like ours share only a very small part of the CATR.

—Interviewee No. 11

Non-Basic Expenditures

NBE is important on two aspects. First, when basic public services are met, presumably, jurisdictions have more resources to shift to other policy areas such as
education, health care, or environmental improvement. Second, there is an argument that local jurisdictions would manipulate the criteria in order to maximize their receivables. No matter which statement is more accurate, local governments have various responsibilities and cannot live with just basic financial needs.

Empirical results show that new CATR program did not bring richer and poorer counties (cities) closer. An existing empirical study conducted by Huang and Sun (2007), interviewing and surveying Taiwan’s counties and cities, indicated that poor jurisdictions do not have extra revenue to shift to non-basic expenditures. This chapter and Huang and Sun’s study both conclude that the transformation of CATR distribution did not contribute to a more balanced provision of non-basic public services across the 23 jurisdictions. In addition, some jurisdictions, such as Penghu County, have been found to have high NBEs but low affordability. This situation would indicate that some poorer jurisdictions must depend heavily on intergovernmental grants or other non-recurring revenue.

**Self-raised Revenue**

Results of CVs and MMRs suggested a more equalized condition of the 23 jurisdictions’ self-raised revenue after year 2000. Achieving inter-regional balance can result from increasing revenue raising efforts in poorer jurisdictions or the decreasing revenue raising efforts in richer jurisdictions. The data, however, suggest that the achievement of more balanced inter-jurisdictional self-raised revenue is primarily due to the decrease of SR in richer jurisdictions. Comparisons of MMRs of all 23 second-level jurisdictions and MMRs of 21 counties and cities indicate that the Taipei Municipality has been the jurisdiction with the most per capita SR during the 16 years. The data also

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45 The basic expenditure in their project is also defined by the CATR distribution formula.
reflects a large drop of Taipei Municipality’s SR in 2000. Clearly, the change of Taipei Municipality’s SR came mainly from the 1999 amendment of the Allocation Law, which transferred the sales tax authority from municipalities and provinces to the national government.

On the other hand, 21 counties and cities demonstrated a more balanced SR. Even though the change between 1992-1999 and 2000-2007 is slight, it is significant. The change is primarily due to the increase of SR in poorer jurisdictions. However, it is difficult to know the impact to either the new CATR program or the rearrangement of tax authorities. And while the 1999 amendment of the Allocation Law and the change of CATR program improved inter-regional balance on self-raised revenue, the Local Tax Act does not encourage additional tax efforts. One of the interview participants stated:

We can only levy a new tax for four years, and it usually takes up to two years for a new tax to be passed on the local council. To continue a tax? You have to go through the process all over again. In my opinion, the Local Tax Act is nothing but a piece of paper.

—Interviewee No. 10

Characteristics and CATR Receivables

Overview

This section is organized around the third empirical question: “By using the formula, jurisdictions with what characteristics receive more/less funds?” Although the national government asserts that the distribution formulas reflect the difference in jurisdictional fiscal conditions, the examination of equalization found results against the statement. In addition, interviews conducted in Taiwan with local practitioners also found that the
current formula-based program seldom takes into account regional differences in economic development:

They said land area, population, etc., are fair factors. I am not saying they are not, but shouldn’t an equalization program consider more about what makes poor counties poor? Shouldn’t the formula include some economic disadvantage factors? My advice is to include the poverty index in the formula, explicitly or implicitly. The distribution should at least let poor jurisdictions like ours maintain a standard level of expenditures. To be honest, the current distribution of CATR funds leaves poor counties at a disadvantage. If they would just transfer some funds from richer counties to us, it would be greatly appreciated.

—Interviewee No. 12

The question to explore is whether the current CATR program favors jurisdictions with better financial or revenue figures. This examination is a test of the relationship between “degree of demand” and “transfer receivables” in a formula-driven revenue sharing program. Kitchen (2006) claimed that a formula of unconditional intergovernmental transfer should be composed of the measurement of expenditure needed and a measure of fiscal capacity. He further argued that the expenditure need should be estimated with variables such as population, and that fiscal capacity should consider poverty indicators. However, Khemani (2004) indicated that the formula design might involve political factors that always favor jurisdictions with more bargaining chips. In the previous section, it was found that CATR formulas have been considered as not significantly improving inter-regional equalization across local jurisdictions, and this section provides further information on the implementation results of the current CATR program.

The CATR program is an equalization program concerning both local fiscal capacity and expenditure needs. Based on the interview results and results from the previous analysis, six characteristics have been identified as economic development factors that
describe expenditure needs or poverty, including population density (PD), elder population (EP), percentage agriculture, forestry, fishery and animal husbandry labor (PAFFAL), percentage of the labor force having college degrees (PCD), percentage of residents that are considered low-income (PLI), and unemployment rate (UR). The analytical strategy is presented in Figure 10. These six variables are introduced, along with the descriptive statistics, in Table 20. For each factor, the average values for 8 years (2000-2007) are used and income variables are converted into 2007 dollars.

**Variables and Data Information**

Population density (PD) is defined as a need index. In the statistical descriptions section of jurisdictional *affordability*, the level of *affordability* is found to be higher in municipalities and cities than in counties. One shared feature of these jurisdictions is
The elder population (EP) is defined as both need and poverty index. Three of the four interview participants from county (city) DOFs claimed that the elder population is important in three ways. First, a larger elder population places a heavier burden on the labor population. The elder also are related to expenditures on health care insurance and social welfare. Finally, a jurisdiction with a high elder population usually indicates it is less attractive to the labor force. These phenomena make the elder population an important indicator of county jurisdictional fiscal conditions. The variable is measured as the percentage of the population aged 65 and older to the total population. The average elder population is 10.32% with a small standard deviation, at 2.13. Taipei County has the lowest elder population percentage at 6.85 among 23 jurisdictions, while Penghu County has the highest, at 14.67% of its total population. Presumably, more elderly suggests a higher demand for CATR funds.

The percentage agriculture, forestry, fishery and animal husbandry labor (PAFFAL) is considered a poverty indicator. All of the interview participants from county (city) DOFs claim that a higher percentage agriculture, forestry, fishery and animal husbandry labor significantly influences local finances through the tax structure. Current discretionary
taxes of local governments in Taiwan favor jurisdictions with a larger labor force in industry and business and favor less those with agriculture, forestry, and fishery and animal husbandry as their dominant industries. The minimum value reflects the percent of labor in these three industries in the Taipei Municipality, recorded as 0.28%. The maximum value presents labor in the three industries in Chiayi County, recorded as 27.03%. The difference is almost 100 percent between Taipei Municipality and Chiayi. Presumably, higher values of this variable are associated with less self-raised tax revenue, and this variable should have a reverse correlation to the CATR receivables.

The percentage of the labor force having college degrees (PCD) is considered a reverse poverty indicator. The argument that education is correlated with economic development is proven by both growth theories and empirical studies (Gyimah-Brempong, Paddison, & Mitiku, 2006). Having more highly educated labor is associated with the stronger economic competence. This variable is thus important if the current distribution institution takes education into consideration. On average, 29.64% of the total labor force has a college degree, with a standard deviation recorded at 10.92. Taitung County has the least educated labor force (13.28%), while Taipei Municipality has the most labor with college degrees (58.10%). Since education is positively related to economic development, it should be negatively related to CATR receivables.

The percentage of residents that are considered low-income (PLI) is an indicator of poverty. This variable is important in identifying economic competencies across jurisdictions. Taiwan is a small country with a high variance of jurisdictional differences in histories, cultures, and industries. The low-income variable is measured as the portion of total population that is below basic living standard, as defined by the Directorate-
General of Budget, Accounting, and Statistics. On average, 1.14% of the population is defined as low-income. Table 20 indicates large differences in this variable among the jurisdictions. Presumably, a higher value indicates a higher demand for CATR funds.

The unemployment rate (UR) is considered an important poverty indicator of the regional economic condition in the current literature. It can indicate the openness of the labor market of a jurisdiction, which usually implies the degree of business activities. The unemployment rate is defined as the percentage of unemployed labor (age 16-64). The average annual unemployment rate is 3.98% with a standard deviation of 0.38. Penghu County has the lowest unemployment rate, at 3.21%, while Keelung County has the highest unemployment rate, at 4.59%. This variable is presumably positively related to county (city) receipts of CATR funds — the higher the unemployment rate, the more demand for CATR funds to improve the economic condition.

Results: Spearman’s Rank Order Correlation Coefficients

A well-designed equalization program should address disparities in jurisdictional revenue capacities. Spearman’s Rank Order Correlation Coefficient (denoted as $r_s$) is used to examine the relationships between the “demand/poverty” variables and the actual received CATR funds.\textsuperscript{46} The decision to use $r_s$ instead of the commonly used correlation measurement — Pearson’s Correlation Coefficients, $r$, is for the following reasons. First, the Pearson Correlation Coefficient assumes a normal distribution of the population mean, while the Spearman Rank Order Correlation Coefficient is distribution free. In addition, Pearson measures the linear association between two sets of variables, while Spearman measures any association between two variables, including monotone. Finally, in the

\textsuperscript{46} CATR receipts are a county’s (city’s) total receipts of CATR funds, including general and special CATR per capita.
context of this chapter, the relevance of the two sets of variables is more important than the values of correlation. Therefore, this study sacrifices some information of correlation coefficient to avoid the risk of linear correlation and normal distribution assumptions.

The interpretations of Spearman’s Rank Order Correlation Coefficient are similar to the interpretations of the Pearson’s Correlation Coefficient, where $r_s$ takes values between -1 and 1. A larger absolute value of $r_s$ indicates a stronger correlation between the two sets of variables. The closer the absolute value is to 1 suggests the two sets of variables are closer to being perfectly correlated, and vice versa. Positive $r_s$ indicates a “more-more” or “less-less” relationship of the two sets of variables. In contrast, negative $r_s$ refers to the relationship as being “more-less” or “less-more.” A statistical t-test was employed to examine if the $r_s$ is significant in the statistical sense. Results on Spearman’s Rank Order Correlation Coefficient is summarized in Table 21 and presented below.

*Population density* is inversely correlated with the receipts of CATR funds. Jurisdictions with higher population density receive less CATR funds to support for their basic financial needs, while this result is not supported by statistical t-test. *Percentage of elder population* is an indicator of economic disadvantage. The estimated result on this variable is positive, which means a jurisdiction with a higher elder population receives more CATR funds, accordingly. The t-test tends to conclude the relationship between the two variables is statistically significant. *Percentage of labor in agriculture, forestry, fishery & animal husbandry* is also an indicator of economic disadvantage, since the current tax structure in local governments of Taiwan does not favor jurisdictions with agriculture as their dominant industry. The result demonstrates that CATR fund receivables are
Table 21: Results of Spearman’s Rank Order Correlation Coefficient

<table>
<thead>
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<th></th>
<th>PD</th>
<th>EP</th>
<th>PAFFAL</th>
<th>PCD</th>
<th>PLI</th>
<th>UR</th>
</tr>
</thead>
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<td>Rs</td>
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<td>0.591</td>
<td>0.267</td>
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<td>0.796</td>
<td>-0.103</td>
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<td>3.360**</td>
<td>1.270</td>
<td>-1.510</td>
<td>6.040**</td>
<td>-0.470</td>
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<tr>
<td>p-value, two tailed</td>
<td>0.188</td>
<td>0.003</td>
<td>0.218</td>
<td>0.126</td>
<td>0.000</td>
<td>0.642</td>
</tr>
<tr>
<td>Expected sign</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
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</tr>
<tr>
<td>Actual sign</td>
<td>-</td>
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</tr>
</tbody>
</table>

positively related to the local dependency on agriculture, forestry, fishery & animal husbandry. Nevertheless, this result is not significant in the statistical sense. The percentage of labor with a college degree measures the relationship between human capital and CATR receivables. The result indicates a reverse correlation between the two variables. Jurisdictions with a higher portion of college-educated laborers receive less CATR funding. This result is weakly significant, at a 87% confidence standard. The percentage of low-income persons is an economic disadvantage variable that is considered to demonstrate the rate of poverty. This variable shows a positive correlation with CATR receipts, and this result is strongly supported by the significance test. The unemployment rate results show a reverse correlation with the CATR variable, but the correlation is insignificant in the statistical sense.

Analysis: Do Poorer Regions Receive More?

This section is framed to answer the empirical question: “Are there factors that directly or indirectly make the distribution of CATR funds disfavor jurisdictions with weaker revenue capability?” This question is raised because the current literature has noted that even a formula-based equalization program could involve political factors that favor regions with greater political capital. The argument is based on the political
expediency hypothesis by Grossman (1994), which indicated that when the design of allocating a formula is not transparent or objective enough, the resulting transfer allocations usually leave local authorities with weaker political capital at a disadvantage. Interview participants from poorer jurisdictions claimed they are always at a policy disadvantage because of their weak political capital. The goal of the examinations presented in this chapter is to provide evidence on whether the current CATR distribution addresses the difference in revenue capacities and adjusts for the expenditure needs of local jurisdictions. Several empirical studies of Taiwan have found that current tax structure favors local jurisdictions with stronger economic development, and that the CATR program distribution should compensate financially disadvantaged regions. Spearman’s Rank Order Correlation Coefficient measures the monotone correlations between six specified variables and actual CATR receipts. Table 21 shows that two variables are significantly correlated with the CATR distribution with expected signs, while only the low-income variable shows a strong correlation with the CATR receipt. The remaining four variables are considered irrelevant to the CATR distribution formula.

**Population Density**

The justification of the CATR program is to assist jurisdictions with difficulties in providing basic public services, such as basic personnel expenses. Since urban areas have heavier administrative needs, their demands for CATR funds should be larger than rural areas. However, the negative sign of the $r_s$ of population density implies that jurisdictions with more crowded populations are subsidized less. Moreover, the result is just weakly supported by statistical test at the 81% confidence standard, and the correlation (-0.2) is
considered very weak. This means the current distribution regulations pay very little attention to the differences in administrative needs between urban and rural areas.

**Percentage of Elder Population**

Geographically, Taiwan is a small country compared to other countries in the world, but it still has large population differences among jurisdictions. Because of historical and cultural factors, some jurisdictions have a larger elder population than others. In the context of economic competence, this population structure is usually associated with a lower economic development capability. Also, a jurisdiction with a larger elder population than a labor force population usually indicates a recession of business activities. On the revenue side, this population structure brings weak revenue capabilities. On the expenditure side, a larger elder population also indicates more demands for welfare programs and health care institutions. Therefore, jurisdictions with a higher percentage of elderly need more CATR funds to either compensate for the low revenue raising ability or to support the higher expenditure needs on welfare and health care. The results presented in Table 21 show that the current distribution of CATR funds generates a positive correlation between the elder population variable and CATR receivables, while the correlation is considered moderate.

**Percentage of Labor in Agriculture, Forestry, Fishery & Animal Husbandry**

This variable is related to financial disadvantage, since the current local tax structure disfavors jurisdictions with greater dependency on those industries. A well-designed equalization program should take into account environmental differences on the economic development of local jurisdictions, but interview participants from local DOFs claimed that the current distribution of CATR funds ignored the weakness in revenue
capability of agriculturally based jurisdictions. The result on Spearman’s Rank Order Correlation Coefficient showed a positive association between this variable and CATR receivables. However, this result is not indicated by the statistical significance test.

**Percentage of Labor with a College Degree**

Existing growth theories have asserted that more highly educated laborers are associated with a higher level of economic development. In the context of inter-regional equalization, local jurisdictions with more highly educated laborers should be subsidized less, since they have more productive human capital. The result on Spearman’s Rank Order Correlation Coefficient suggests that the current CATR program is weakly and inversely correlated to this education variable, while this evidence is just weakly supported by the statistical test.

**Percentage of Low-Income Persons**

Poverty is a good indicator of regional economic conditions. On the revenue side, tax collections may be low because taxable income and properties are low. On the expenditure side, social welfare expenses related to low-income assistance may be high. Therefore, the higher the percentage of residents who claim poverty, the worse the economic condition the county (city) faces, and thus the higher the demand for CATR funds. The results of Spearman’s Rank Order Correlation Coefficient provide strong evidence of a positive correlation between the poverty variable and the CATR variable. Although the formula may not express this poverty indicator explicitly, the implementation of CATR program followed by the distribution formula generates a satisfied result. Jurisdictions with larger portions of their population claiming poverty can receive a higher CATR subsidy.
Unemployment Rate

The unemployment rate has been a commonly used indicator of regional economic conditions. A high unemployment rate is not only directly related to the reduction of tax collections, but it also implies a recession of regional economics. Additionally, a high unemployment rate may imply an increase in migration from poorer jurisdictions to richer ones, and this may deteriorate the poorer regions’ economy for the future. The result showed a negative correlation between this variable and CATR receipts, but it is weak and insignificant. This implies that the current distribution formula is not associated with the difference in the unemployment rate among counties (cities).

Conclusion

The literature on equalization transfers states that this kind of program is used to ensure some standard level of public services with minimal control by the grantee. Wilson (2006) argued that “like should be treated alike” is the basic principle of equalization programs. His argument makes equalization transfers more important in a unitary country versus a federal country, since local residents in a unitary country pay taxes at the same rate as other residents of similar income, regardless of where they live. An equalization transfer program is important, as residents who live in poorer jurisdictions should receive the same level of basic public services as those who live in richer jurisdictions. However, the findings of this chapter suggest that this may not be the case.

Results indicate that the overall inter-jurisdictional financial condition of the 23 local jurisdictions became more balanced during the implementation period of the new CATR program. The improvements in inter-jurisdictional disparity were reflected in both
affordability of basic personnel expenses and self-raised revenue. However, the self-raised revenue disparity improvements are not attributable to the transformation of the CATR program alone. Empirically, the 1999 amendment of the Allocation Law also has a significant influence on municipalities’ revenue structure. Further, the examination on 21 counties (cities) did not support a more equalized inter-jurisdictional balance on affordability. This result implies that the use of distribution formula did not bring a more equalized picture of affordability, as compared to the discretionary distribution. The brief conclusion of this examination is that the formula did not shift more resources to poor regions.

Interview results support that distributing by formula gives a more open, more stable, more transparent, and more predictable process of CATR distribution, but the formula per se does not help reduce fiscal disparities across counties and cities. Interview participants indicate that the primary reason for the failure of distribution formulas is the involvement of political factors that favor large or rich jurisdictions. Examinations of the correlation between important local socioeconomic variables and the receipt of CATR funds suggest that the current distribution of CATR funds does not include enough poverty indicators. In particular, four of the six indicators are found to be irrelevant to CATR distributions, and one of the two significant variables is considered merely a moderate correlation. Through the analysis done in this chapter, three implications for policy makers and one for the current literature on equalization transfers are made and presented in chapter seven.
Chapter Five: Expenditure Impacts of CATR Program

Overview

Current empirical literature about Taiwan’s revenue-sharing program, the Centrally-Allotted Tax Revenue (CATR) program, mainly focuses on how the central government can assist local governments by using CATR funds, but relatively little research has focused on how the recipients allocate their receivables. A complete evaluation of this program should consider both the distribution efficiency and effectiveness of the fund in improving local finances. The previous chapter examined the issues related to inter-jurisdictional equalization as an evaluation of the grantor’s efficiency, and this chapter deals with the recipient side issues. The research presented in this chapter aims to answer research question two: “How do local governments respond to the received CATR funds?” In particular, it focuses on two questions — (1) how do those funds affect local spending, and (2) how does the change in distribution approach influence the expenditure impact of CATR?

Concerning the first question: how do the funds affect local spending, a large number of empirical studies on intergovernmental transfers have found that lump-sum transfers may distort local expenditures and inflate spending⁴⁷ (Bailey & Connolly, 1998; Becker, 1996; Bowman, 1974; Deller & Maher, 2005, 2006; Feldstein, 1978; Gamkhar & Oates, 1996; Gramlich, Galper, Goldfeld, & McGuire, 1973; Helen F. Ladd, 1993; Lalvani, 2002b; Lyons & Morgan, 1977; Marshall, 1991; McGuire, 1979; Tuttle, 2004; Weicher, 1972). This expenditure over-induced impact is termed the flypaper effect.

⁴⁷ Traditional neo-economic theory, proposed by Bradford and Oates (1971), indicates that the spending effect of lump-sum transfers is identical to private income, since the increases of lump-sum transfers and private income have the same level of income effect.
There are several empirical and theoretical explanations for the flypaper effect.⁴⁸ Among these, Bird and Smart’s (2002) perspective, which is based on Niskanen’s budgetary-behavior model (Niskanen, 1971), provides an appropriate explanatory framework that can be applied to the allotted-tax revenue program in Taiwan.

Bird and Smart noted that taxpayers are more cautious about public spending than public revenue, but often do not understand that lump-sum transfer are not “free lunches” — they are not aware that the expenditure is also reimbursed from their tax payments. This misperception enables local politicians to pursue higher level of budget. ⁴⁹

The allotted tax revenue program carries out a revenue sharing plan among second-level and third-level governments in Taiwan, and the funding pool is composed of major national, municipal, and county (city) taxes. From the perspective of local citizens, allotted-tax revenue funds are not necessarily related to their tax payments, since this program is designed to improve inter-regional equalization and is expected to favor jurisdictions with lower financial capabilities. From the perspective of local politicians, since the goal of this program is to subsidize jurisdictions with insufficient funds to support the minimum level of public services, creating the gap between basic

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⁴⁸ The empirical explanations of the existence of the flypaper effect include misspecification of the types of grants, the ignorance of the endogeniety of the grant variable, and other technical issues related to the estimated equation, such as problems associated with omitted variable biases. From the theoretical perspective, the appearance of the flypaper effect may be attributed to the competing relationship between the grantor and the grantee governments, the intervention of the political institutions such as agenda manipulations, a voter’s fiscal illusion that may underestimate the cost of expenditures reimbursed from their tax payments, the competing for grants with neighborhoods, the voter’s perceptions of tax exportability, the uncertainty of grants, and risk-averse bureaucrats, etc. Chapter two provides a detailed review and complete literature reference for the flypaper effect.

⁴⁹ The perspective that a bureaucrat’s utility maximization results in total budget maximization is derived from William A. Niskanen’s budgetary behavior model (1971), which assumes bureaucrats seek to maximize the utilities for themselves. The utilities of bureaucrats are claimed to be a positive monotonic function of the total budget.
expenditures and basic revenue is a way to gain more CATR funds. Therefore, the first hypothesis of research question two is: *The allotted tax revenue fund has a flypaper effect.*

**Regarding the second issue: how does the change in distribution approach influence the expenditure impact of CATR?** There has been extensive research done on the relationship between the taxonomy of transfers and their impact on local fiscal behaviors. However, the focus is mostly on different expenditure impacts between matching and lump sum grants. The different impacts of various distribution approaches of lump-sum transfers has not been well researched. And little research has been done about how a change in distribution formulas impacts changes in expenditure patterns in a single political entity. One exception is that Kothenburger (2005) specifies that the expenditure impacts of transfers are conditioned on the design of equalization formulas. Specifically, he argues that when formula components respond to regional differences in tax capacity, the transfer scheme favors regions with higher tax rates and leads to the expansion of public expenditures. However, if the formula corresponds to the regional differences in actual tax revenue, it encourages tax competition and helps to decrease governmental expenditures.

Kothenburger provides some insights into how the distribution formula affects expenditure sizes, but neither case fits the CATR context. The distribution of CATR funds is mainly determined on regional fiscal capacity, with adjustments for expenditure needs. Further, local governments in Taiwan apply the same tax rates that are predetermined by the central government. Finally, there was not an explicit formula about the distribution of the funds before 1999. As such, it is not easy to infer whether or not the transformation in the distribution approaches of the CATR program has had any impact on the
expenditure effect. Nevertheless, since a formula-based CATR should give local
governments more discretion over the use of the funds than the discretionary program
does (Bahl & Linn, 1994), local governments’ fiscal behaviors should be different. The
second hypothesis is: The transformation of the distribution from a discretionary process
to a formula-based process has an impact on local spending.

Model

Theoretical Model—Nagamine’s (1995) Institutionalized Model

The estimation model adopted in this dissertation is borrowed from Juniche
Nagamine’s institutionalized flypaper effect model (Nagamine, 1995). He uses this model
to analyze the effect of a Japanese revenue sharing program, the Local Allocation Tax
(LAT), on the expenditures of Japan’s municipal governments. His model differs from
conventional flypaper effect model in two major ways:

First, conventional models assume local expenditure decisions are made according to
the median voter’s preference, while Nagamine’s model considers expenditure decisions
as a product of local politicians’ behavior. He adopts Niskanen’s budgetary behavior
model (Niskanen, 1971) and assumes local politicians and bureaucrats are utility
maximizers. From the perspective of public choice, politicians tend to pursue budget
maximization in order to gain political support from voters.\(^5^0\) In addition, local
governments in Japan are obligated to provide a minimum level of public services. For

\(^{50}\) Through Nagamine’s article (1995), there is no statement of the assumption of budget maximization,
while the display of his Japanese expenditure models follows this assumption.
this reason, Nagamine uses the Stone-Geary utility function to present a local politician’s utility: \(^{51}\)

\[
U = \sum_{i=0}^{n} a_i \ln(Q_i - X_i)
\]  

(Eq. 1)

Where \(Q_i\) denotes the demand for good \(i\), \(X_i\) denotes the minimum level that is required for public good \(i\), and \(a_i\) is a parameter of each \(\ln(Q_i - X_i)\). The necessary condition for the Stone-Geary utility specification requires \(\sum_{i=0}^{n} a_i = 1\)

Nagamine argues that while conventional models indicate that grantee governments, as a representative of the median voter, choose to spend the received funds on private goods (the private good consumption in the public sector refers to reducing tax or other tax expenditures), where \(i=0\) and public goods, where \(i = 1,2,…n\), Japanese local governments do not have discretion over tax policy and thus there is no option for private goods consumption (reducing tax or other tax expenditures). This is the first difference of Nagamine’s model from traditional grant models. The revised utility specification becomes:

\[
U = \sum_{i=1}^{n} a_i \ln(Q_i - X_i)
\]  

(Eq. 2)

Local politicians are assumed to maximize the utility function listed above subject to the constraint of available resources:

\[
\sum_{i=0}^{n} P_i Q_i = rY + RS + OG + BO + OR
\]  

(Eq.3)

\(^{51}\) The Stone-Geary function is adopted when there exists a certain minimal level of goods needed to be consumed. It takes the natural log function to model the utility equation.
Where $P_i$ denotes the price of $Q_i$, $\sum_{i=0}^{n} P_i Q_i$ as total local government general spending.

The spending should not exceed the local government’s available resources, including tax $rY$, revenue sharing receivables (RS), other intergovernmental grants (OG), borrowing (BO), and other non-tax and non-grant revenue such as fines and fees (OR).

The second difference between Nagamine’s behavioral model and traditional grant estimation models concerns the local tax rate. Conventional flypaper models assume local governments have full discretion over tax rates, and therefore the tax rate ($r$) can be any value between 0 and 1 ($r \in (0,1)$). However, Nagamine argues that municipal governments in Japan do not have power over tax rate decisions, so the $r$ should be taken as an exogenous factor, $r = \bar{r}$. 52 Traditional literature assumes that local tax rates are endogenous in the model and flexible enough to respond to the increase in local revenue as a result of lump-sum transfers. In countries where local governments have no discretion over tax rates, the private income that can be used to support local activities is given by a predetermined tax rate ($r$) by the central government. Nagamine thus argues that the model should use $r*Y$ instead of $Y$, and this composes the second difference between Nagamine’s and conventional flypaper effect literature. The maximization of Eq.2 subject to Eq.3 yields the local government expenditure function:

$$\sum_{i=1}^{n} P_i Q_i = -\sum_{i=1}^{n} a_i P_i X_0 + a_0 \sum_{i=1}^{n} P_i X_i + \sum_{i=1}^{n} a_i (rY + RS + OG + BO + OR), \ i = 0,1,…,n \ (Eq. \ 4)$$

$\sum_{i=1}^{n} P_i Q_i$ denotes the total general expenditure $E$. $-\sum_{i=1}^{n} P_i X_0$ is considered a constant parameter. $\sum_{i=1}^{n} P_i X_i$ is the cost of the minimum public service obligation of

52 While the conventional model, which assumes $r$ is always adjustable, is not realistic in Japan, Nagamine’s model, which assumes $r$ equals to a fixed rate, is also not realistic. Nevertheless, he argues that the Japanese setting is closer to the assumption: $r = \bar{r}$, and therefore his model fits Japan’s local finances better.
local governments. Nagamine claimed that this term is correlated to local personnel expenses $W$, and he proposed to use $W$ as a proxy for $\sum_{i=1}^{n} P_i X_i$.

With the above substitutions, the local expenditure model developed by Nagamine is:

$$E_k = \alpha_0 + \alpha_1 W_k + \alpha_2' Y_k + \alpha_3 RS_k + \alpha_4 OG_k + \alpha_5 BO_k + \alpha_6 OR_k + \varepsilon_k$$  

(Eq.5)

where $\alpha_2' = \alpha_2 \cdot r$

Nagamine argues that the interpretation of the coefficient on private income revenue (Y) should be refined as $\frac{\alpha_2}{r}$. And this interpretation is the most essential difference between Nagamine’s model and conventional flypaper effect models.

**Discussion of the Model**

As will be introduced in this chapter, local fiscal policy, local fiscal discretion, and the justification and arrangement of the revenue sharing program of Taiwan are closer to Japan than other western countries, so using Nagamine’s Japanese style model is considered more appropriate. This model takes the perspective that local budgets are determined based upon local politicians’ behavior rather than the median voters’ preferences. The setting of this model corresponds to the environment of local finances in Taiwan, and therefore this dissertation chooses to adopt his model rather than other conventional models, such as the median voter model. The similarities between the LAT and CATR programs and between Japan and Taiwan enable this dissertation to apply Nagamine’s model to the context of the CATR program test. 53 However, there are some limitations of Nagamine’s model.

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53 The discussion of appropriateness of applying this model to Taiwan’s CATR program is discussed in later sections of this chapter.
First, this model provides a simplified framework. Nagamine used personnel expenses, \( W \), to substitute for the minimum public services of local governments, without further explanation. However, the basic expenditure needs in Japan include different indicators of each of the 24 spending categories (Mochida, 2008, 2009). It may be true that expenditures on civil servants are the minimum level needed to operate some governmental functions when the spending category needs human input. However, expenditures such as road construction use indicators on the length of roads (Mochida, 2008, 2009), and this is not related to personnel expenses. The lack of further explanation for this substitution leads to confusion about the appropriateness of this model, and the substitution may not be applied to cases when the minimum level of governmental expenditures is not determined by personnel expenditures.

In addition, Nagamine’s model deals with institutional constraints of the Japanese local governments and LAT-type equalization programs, but there are still some issues this model has not addressed. The current literature has identified that one major limitation of the current median voter based model is the lack of attention to political institutions (Bae & Feiock, 2004). However, the public choice model of local behavior, based on Niskanen (1971), has claimed that public spending decisions are made based on the consideration of the number of votes politicians expect to receive in future elections (Alperovich, 1984; Faith, 1979; Grossman, 1994; Rich, 1989). Although Nagamine used the local politician’s behavior model to substitute for the median voter model, his model did not address the influence of political institutions on local spending.

Third, Nagamine’s model assumes expenditures are only determined by available revenue. Again, this could be true, but the assumption needs more empirical support. One
drawback of the conventional flypaper effect model is the lack of a socio-economic variable, which may lead to overestimates of explanatory power of the grant variable. Nagamine’s model does not include any demographic variable either, though he may be able to argue that the minimum level of public service has implicitly accounted for regional differences in demography or economic status.

Model Specification

*The application of the Model to Taiwan*

Local governments in Taiwan share two features with local governments in Japan. First, there is not a participatory mechanism on the budgetary process in Taiwan, and the budgetary process is more a governmental issue than a public issue. The use of local politician’s behavior model can better describe the budget making process than the median voter model, which addresses the issues on the demand side. Second, local governments in Taiwan do not have discretion over major tax policy. Tax bases and tax rates are determined by the central government, which is the same with local governments in Japan, as claimed by Nagamine.

In addition, Nagamine uses his model to detect the flypaper effect of Japan’s Local Allocation Tax (LAT) program. The CATR program is parallel to Japan’s LAT in the sense that they are the most important institutional tools for reducing inter-jurisdictional fiscal disparities. Also, the distribution formulas of the two programs are similar — both are concerned with the relative sizes of the shortages on basic financial needs among local jurisdictions. The adoption of Nagamine’s model is therefore more appropriate than other models, although there are still some differences between these two countries,
which may require some revisions of the model. A detailed comparison of these two programs is summarized in Table 22, which highlights the main differences.

Table 22: Comparisons of the LAT and CATR (PATR) Programs

<table>
<thead>
<tr>
<th>Local Allocation Tax (LAT) 1954-present</th>
<th>Centrally-Allotted Tax Revenue (CATR) 2000-present (current version)</th>
<th>Pre-formula Allotted Tax Revenue 1981-1999 (previous version)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. An unconditional intergovernmental transfer program.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Governed by a specific law or regulation</td>
<td></td>
<td>▪ Allocation Law (only for the funding pool)</td>
</tr>
<tr>
<td>▪ Local Allocation Tax Law</td>
<td>▪ Distribution Regulation of Centrally-Allotted Tax Revenue</td>
<td></td>
</tr>
<tr>
<td>3. Justification of the program</td>
<td>▪ CATR (PATR) is the most important and the only program that aims to reduce horizontal fiscal imbalance among local jurisdictions in Taiwan. According to Article 16 of the Act Governing the Allocation of Government Revenue and Expenditures, CATR is expected to ensure that the minimum revenue is achieved to provide basic public services.</td>
<td></td>
</tr>
<tr>
<td>▪ LAT is the most important fiscal equalization program in Japan. It aims to help local governments maintain the basic level of public services and eliminate fiscal disparities among jurisdictions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Funding pool (according to the current versions for both LAT and CATR)</td>
<td>▪ CATR funds are composed of National tax, Municipal tax, and County (City) tax.</td>
<td>▪ The funds were composed of Provincial tax and County (City) tax.</td>
</tr>
<tr>
<td>▪ National taxes are the only funding source of LAT funds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Allocation of the funds</td>
<td>▪ 94% of the CATR fund is considered General CATR funds, redistributed to local jurisdictions by ratio and by formulas. ▪ 6% of the CATR funds is reserved for emergent use and is termed Special CATR.</td>
<td>▪ 90% of the fund was considered the general allotted tax revenue funds, redistributed to counties and cities by ad hoc decision. ▪ 10% was reserved for emergent uses.</td>
</tr>
<tr>
<td>▪ 94% of the LAT is considered General LAT, distributed by formula to jurisdictions. ▪ 6% of the LAT is considered Special LAT, reserved for emergent uses.</td>
<td>▪ The funds are distributed to municipalities, counties (cities), and townships with different formulas.</td>
<td>▪ The funds were distributed to counties and cities, and the distribution was considered the Province Governor’s</td>
</tr>
</tbody>
</table>
### 6. Distribution formula (in the case of CATR it refers to county (city) formula only)

- The relative size of financial shortage of each funded government.
- Only jurisdictions with insufficient basic revenue to support for basic financial needs are qualified to receive LAT.
- 85% of the distribution is determined by the relative size of the financial shortage of each funded government.
- Jurisdictions with sufficient basic revenue to support basic expenditure needs do not receive CATR funds.
- 15% of the distribution is determined by the relative size of business sales of each jurisdiction.
- Basic expenditure needs are calculated from selected items from three major spending categories: personnel expenses, infrastructure, and welfare expenses. The needs reflect the minimum level of a local government to operate.
- Basic revenue is composed of:
  - 80% (prefectures) or 75% (municipalities) of local tax revenue
  - Total local transfer taxes
  - Discretionary taxes and CATR receives are excluded

- The distribution of the funds to counties and cities were claimed to be dependent on the shortage of basic financial needs, and
- The contribution of the funding pool — the relative size of the business sales tax.
- Ad hoc decision.

### Data source:
- Japan’s LAT program: Mochida (2008, 2009), Taiwan’s CATR program: *Allocation Regulation*

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54 Local Transfer Tax is the tax revenue transferred from the central government to local governments.
Finally, the local government in Japan is required to maintain a minimum level of public services, and the CATR program is designed to ensure that the minimum level of public services provisions are maintained by the local government. Although the minimum level expenditure needs of the two countries are different, the use of the Stone-Geary utility function instead of other utility function is justified when applying Nagamine’s model to Taiwan’s CATR program. Although it is one of the limitations of Nagamine’s model for the substitution of the “minimum level of public service” for personnel expenses, this substitution can be justified in Taiwan. According to interviews with officials from the local Division of Finance and the Department of Budgeting, Accounting, Statistics (DBAS), each local agency always sets personnel expenses as their first budget priority. They claim that government should be able to provide this minimum level of expenditure in order to operate. The definition of basic financial needs also considers the relative sizes of personnel expenses of local jurisdictions. Therefore, this substitution is appropriate, while the empirical issue of collinearity of this variable needed to be addressed.55

Modification of the Model — A Quasi-Experimental Approach

Although the CATR program shares many similarities with the LAT program, which may be able to justify the adoption of Nagamine’s model to analyze the expenditure effect of the CATR program, the estimated model has been further modified to fit the research questions and the Taiwanese local finances better.

55 Collinearity refers to the situation when two or more explanatory variables are linear correlated in a single regression.
The primary modification is the use of an interactive dummy variable \( t_1 \text{CATR} \), defined as \( t_1 \text{CATR} \), where \( t_1 = 1 \) when observations are in the period of 2000-2007, and \( t_1=0 \) otherwise. This modification is made because of the transformation of the CATR program in 2000, while the Japanese LAT program has been operated consistently. The variable \( t_1 \text{CATR} \) measures the change of expenditure impacts of the CATR program between the pre-formula period (1992-1999) and post-formula period (2000-2007). By including this variable, the estimated model is an interrupted time-series one (or quasi-experimental model) (Shadish, T.D., & Campbell, 2002), which aims to detect the difference (if any) of the expenditure impact of CATR funds between the pre- and post-periods, when the formulas were introduced in 2000 to guide the distribution of the funds.\(^{56}\) The interactive dummy addresses the second hypothesis of research question two: “whether or not the change of this program leads to changes on the expenditure stimulating effect, and what are those changes?” Specifically, the variable \( \text{CATR} \) provides the pre-formulated CATR’s impact on general local expenditures, and the interactive dummy provides additional information regarding the impact due to the change of this program in 2000.

In Figure 11, \( t_1 \text{CATR} \) represents the segment 2000-2007, when the distribution formula was introduced into the CATR program. If the second hypothesis is correct, the influence of CATR on the general expenditure will be \( t_1 \text{CATR} + \text{CATR} \) or \( t_1 \text{CATR}' + \text{CATR}' \), depending on the sign of the coefficient of \( t_1 \text{CATR} \). However, if the transformation is considered to have no influence on CATR’s expenditure impact, i.e., if the variable \( t_1 \text{CATR} \) does not gain statistical support, the influence of the CATR on the general expenditure should follow the original \( \text{CATR} \).

\(^{56}\) Interrupted time-series model is usually adopted as one of the quasi-experiment approaches. The treatment is always related to a time-sensitive event, which is believed to have some impacts on the dependent variable.
The interrupted time series approach has long been used in assessing the policy effect (Campbell, 1969; Chaloupka, 1996; Cook & Campbell, 1979; Wagenaar, 1983, 1986). This approach provides the most efficient way to observe the relation between the policy (or policy change) and the policy outcome (Wagenaar, 1986). However, one limitation of this approach is that the estimated result would attribute all changes to the treatment (the interrupted variable, in this dissertation the $t_1CATR$), while it might be possible that other factors co-occur with this policy change. For example, the CATR change happened in 2000, but the new tax structure was implemented in 2000, as well.\footnote{The new tax scheme was introduced in Chapter One. There is no major change on local major taxes, while some minor changes still need consideration.}

This implies that the private income variable could possibly have more or less effect on general spending. Further, since the flypaper effect emphasizes the comparison between income and grant variables, it is inappropriate to assume that the expenditure impact of the income variable is independent from the system. Presumably, if we agree the measure
of the flypaper effect is to compare the coefficient on $CATR$ with the coefficient on $Y$, the measure of the “additional” effect of the change of distribution in 2000 should be the comparison between coefficients on $CATR$ and $t_1*CATR$ with coefficients on $Y$ and $t_1*Y$.

Therefore, the estimate model of this dissertation also adds an interactive dummy variable $t_1*Y$ to capture the unobserved variable that co-existed with the change between 1992-1999 and 2000-2007. As a result, the expenditure impact model, revised from Nagamine’s (1995) institutionalized expenditure model, is shown as:

$$E_k = \alpha_0 + \alpha_1 CATR_k + \alpha_2 Y_k + \alpha_3 t_1 CATR_k + \alpha_4 t_1 Y_k + \alpha_5 W_k + \alpha_6 OG_k + \alpha_7 OR_k + \alpha_8 BO_k + \epsilon_k$$

(Eq.6)

Where:

- $\alpha_{0-8}$: coefficients on each explanatory variables;
- $E$: total general expenditure;
- $W$: basic personnel expenses, which is confirmed to represent the basic standard of government function (Nagamine, 1995);
- $Y$: private income variable, in this dissertation $Y$ refers to personal expendable income;
- $CATR$: received allotted tax revenue funds;
- $t_1$: a dummy variable, $t_1=1$ for the period 2000-2007, $t_1=0$ for the period of 1992-1999;
- $OG$: other grants, including general and categorical grants;
- $OR$: non-tax own source revenue, including fees, fines, and charges;
- $BO$: borrowed revenue, including local bonds.

**Modification of the Model— Dealing with the Adjusted Private Income Variable**

The second modification of Nagamine’s model is the use of the income variable. In Nagamine’s institutionalized model, the $Y$ variable is a reduced form of $r*Y$, where $r$ is the average local tax rate. Nagamine restored the real income coefficient by dividing the coefficient $\alpha_2$ with $r$. In the context of this model, if we followed Nagamine’s testing strategy, the actual expenditure impact of the private income variable should
be($\propto_2 + \propto_4/r$). Nagamine’s specification of the private income variable, although it specifies the institutional difference between Japanese local governments and local governments in other countries, arbitrarily assumes the local tax rate $r$ is constant over the sampled years. It is not clear if that reflects the real situation of Japan, but it is not true in Taiwan. Using the four major local taxes, land value tax, land value incremental tax, house tax, and deed tax, to calculate the weighted average local tax rate $r$, the result shows that local tax rate varied from 0.02 to 0.04 over the 16 years. The assumption that $r$ is constant over the sampled period is not appropriate to Taiwan’s situation. Therefore, this dissertation uses tax-able income $\hat{Y}$, defined as $r*Y$ instead of a direct private income variable. The estimated equation of this dissertation is:

$$E_k = \alpha_0 + \alpha_1 CATR_k + \alpha_2 \hat{Y}_k + \alpha_3 t \cdot CATR_k + \alpha_4 t \cdot \hat{Y}_k + \alpha_5 W_k + \alpha_6 OG_k + \alpha_7 OR_k + \alpha_8 BO_k + \epsilon_k$$ (Eq.7)

where $\hat{Y} = r*Y$. Other notations are the same as presented earlier followed Eq.6.

**Modification of the Model — the Endogenous CATR Variable**

The third modification of Nagamine’s model concerns the instrumented revenue-sharing variable. Nagamine’s model identified the LAT program as endogenous in the system with the expenditure variable. The approach he took to overcome the endogenous problem was to use the Two-Stage Least Square model, with the LAT variable serving as an instrumented variable against “land area per person” as an instrument. The discussions about the instrumented and instrumental variable follow.

As summarized in Table 22, the determinants of the allotment of CATR funds include the shortage of basic financial needs and the business sales tax that is collected in each

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58 The average tax rate is calculated from the total tax collection of the land value tax, land value incremental tax, house tax, and deed tax, divided by the total tax base of the four taxes. Information about the tax base is shown in Appendix 2, and the tax collection numbers are shown in Appendix 3.
jurisdiction. During the PATR period, the Governor of the Taiwan Province claimed that the allocation of PATR funds reflected the demand for the fund to close the gap between basic expenditure needs and available revenue. According to the current *Distribution Regulation*, the distribution of CATR funds to county level governments is also determined by the three elements: basic financial needs, basic financial revenue, and business sales. The simplified current distribution formula could be presented as:

\[
\begin{align*}
(7) & \quad \frac{3\text{-year average of (basic financial need} \ - \ \text{basic financial revenue}) \text{ of county } j}{3\text{-year average of (basic financial need} \ - \ \text{basic financial revenue}) \text{ of all counties (cities)}} \\
(8) & \quad \frac{\text{recent year business sales of county } j}{\text{recent year business sales of all counties & cities}}
\end{align*}
\]

The estimated CATR receivable of county \( j \) =

Total General CATR * 39% * [85% * (1) + 15% * (2)]

The basic expenditures are defined as a portion of the general expenditure, and this relationship indicates that variables \( E \) and CATR are interdependent in the simultaneous system. While CATR is also identified to have some correlation with taxable revenue, the latter is exogenous to this system since neither CATR nor \( E \) can be a determinant to \( \hat{Y} \). The endogenous nature of the CATR variable may cause problems with the endogenous right hand side variable. In order to solve this problem and prevent biased estimated results, CATR is used as an instrumented variable in the first stage equation, and a Two-

\[^{59}\text{Detailed presentations of the CATR distribution formulas were presented in Chapter Four of this dissertation.}\]
Stage Least Squares (2SLS) estimation is adopted to provide consistent and unbiased estimates. 60

There are two theoretical foundations for intergovernmental transfers. One is from the model of efficiency and equalization. This model assumes governments are purely benevolent, and use intergovernmental transfers as a policy tool to achieve regional equalization and economic efficiency (Oates, 1972). An equalization transfer program is preferred, and its goal is to assist local governments with providing comparable levels of public services relative to taxation. In the perspective of benevolent governments, Tekeli and Kaplan (2008) claim that “the economic justification of grants assumes that the central government may attempt to close the gaps between the revenue-raising capacities of cities and the cost differentials in the provision of publicly provided goods and services” (Tekeli & Kaplan, 2008, p. 955).

Based on the Distribution Regulation of CATR, closing the gap between revenue-sharing capacity and expenditure needs should be the primary goal of this program; the post-formula CATR program is considered to follow the model of efficiency and equalization. Empirically, according to CATR’s distribution regulation, one component of the basic financial need is the social welfare expenses calculated following by the regulation of elderly pensions (Article 9-2, Distribution of Regulation of the Centrally-Allotted Tax Revenue). Further, on the revenue side, a population structure with more elderly brings weak revenue capabilities. On the expenditure side, a larger elder population also indicates more demand for elderly pensions and health care institutions.

60 In addition to the existing predetermined variables in Eq.7, the distribution history of the PATR funds and the current CATR distribution formula suggests including a business sales tax variable. This variable, however, has correlation coefficients too low for the CATR variable (-0.29) and the expenditure variable (0.09). This low correlation implies that the use of business sales tax in the first stage equation may not be appropriate.
Therefore, jurisdictions with a higher percentage of elderly need more CATR funds to either compensate for the low revenue raising ability or to support the higher expenditure needs on welfare and health care. In the framework of the equalization model, the instrument chosen for the post-formula CATR period is the percentage of elderly residents (residents more than 65 years old), OLD. OLD is coded as 0 for the period 1992-1999 for two reasons. First, the correlation between OLD and CATR for the pre-formula period is only moderate (\( \rho = 0.59 \)). Second, since the distribution of the pre-formula CATR funds depends on the province governor’s discretion, a discretionary transfer program is considered easier to engage in political interventions (Boadway & Shah, 2006). This dissertation assumes the variable OLD only influences the post-formula CATR distribution. The coefficients of correlation shown in Table 23 provide additional evidence to include this instrument. The correlations between the variable OLD and the entire period CATR and E are weak, since there are eight years (1992-1999) where OLD is coded as 0. However, the goal to include this variable is to instrument for the post-formula CATR, and the correlations with post-formula period CATR and E are strong (\( \rho =0.72 \)). Therefore, it is confirmed that the inclusion of variable OLD is appropriate.

<table>
<thead>
<tr>
<th></th>
<th>OLD Total Time Period</th>
<th>Post-formula Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure</td>
<td>0.10</td>
<td>0.85</td>
</tr>
<tr>
<td>CATR</td>
<td>0.26</td>
<td>0.72</td>
</tr>
</tbody>
</table>
The determination of the grant distribution can be explained by the efficiency and equalization model, but it can also be understood as a political process (Tekeli & Kaplan, 2008). The justification of Taiwan’s allotted tax revenue program is that it is designed to achieve inter-jurisdictional equalization, and this is the efficiency/equalization side. Nevertheless, positive theories of intergovernmental transfers also suggest that the grant distribution might involve political interests (Alperovich, 1984; Faith, 1979; Grossman, 1994; Leyden, 1992; Rich, 1989).

Wildavsky (1984) claimed that the budget process reflects the process of politics. The budgetary process is fulfilled with calculations and coordination (Wildavsky, 1986, p. 34). The result for this conflicting and cooperative process is that the budget becomes incremental, with minor upward adjustments. The incremental budgeting model is not as predominant as it was in two decades ago in the United States, but many countries still take this approach to analyze their budget process and have found significant support for the theory. Taiwan is no exception. Su (2000) studied the three types of provincial grants to counties and cities for the period of 1986-1999, including the Provincial General Grant, the Provincially-Allotted Tax Revenue, and other types of grants. Her findings indicate that the grant level of the previous period is a significant factor for the current grant level. Based on the theory of incremental budgeting and the empirical support found by Su (2000), this dissertation also uses “lagged CATR” as an instrument to measure the CATR variable. The decision of the CATR distribution for the next year is made before the middle of the current fiscal year, while the current budget is still in place. Officials from the local DBAS indicated that the preparation of next year budget depends on the final account numbers for the previous year, adjusted for current year revisions and next year
Table 24: Correlation Coefficients between CATR<sub>pre</sub> and Dependent Variables for Two Stages

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>0.72</th>
<th>0.84</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATR</td>
<td>0.82</td>
<td>0.91</td>
</tr>
</tbody>
</table>

estimations. Therefore, this dissertation uses the CATR number in 2 years prior to the current, CATR<sub>pre</sub>, as an instrument. The correlations between this variable and CATR and E for the entire and pre-formula periods are presented in Table 24. The high correlations between the CATR<sub>pre</sub> and the dependent variables for the two stages suggest the inclusion of this variable as an instrument in the first stage is appropriate.

The first-stage equation is:

\[
CATR_t = \beta_0 + \beta_1 CATR_{pre} + \beta_2 OLD + f(\text{all independent variables in Eq.9 except for CATR and } t_1CATR)
\]

(Eq. 8)

Where \( \beta_0 \) is a constant term, \( \beta_1 \) and \( \beta_2 \) are the coefficients of \( CATR_{pre} \) and \( OLD \).

Panel Data

The data are a panel set composed of 21 counties (cities) across 16 years.\(^{61}\) This type of data always faces some unobservable variances among units and/or across time periods.

---

\(^{61}\) Initially, this dissertation considered examining all 23 jurisdictions, including municipalities, counties, and cities. A scatter plot used to detect bivariate outliers between CATR and EXP — as they are the main focus of this chapter — found Taipei and Kaohsiung municipalities have patterns different from those of other jurisdictions (see Appendix 1). The raw data show that there is no record reflecting that Taipei and Kaohsiung municipalities received allotted tax revenue for the period 1992-1998. The data and the figure also indicate that the degrees of correlations between CATR and EXP show significantly higher values over other observations. This implies that these atypical values may lead to some bias of the estimate result. In
Empirically, to control for those unobservable factors and to prevent omitted variable biases, regression models are controlled for fixed trend effects or randomly selected trends effects. According to Jones (2000), the random effect is used when the sample is randomly selected from the population and the result is expected to be inferred to the population; while the fixed-effect model infers the result simply to the selected sample. In this dissertation, the unit of analysis is county (city) and the studied targets include all counties and cities. In addition, the use of fixed-effect model is more common in the existing literature. The dissertation chooses to use a fixed effect control to account for the unobserved omitted variables. Using the fixed effect, the model assumes that the controlled unknown variable is constant over time, and therefore there is no serial correlation error term within any individual county (city). It is not clear whether or not this assumption is true, but to ensure the estimates are consistent, the robust standard errors are used.

**Detecting Multicollinearity**

A collinearity issue happens when there are overriding correlations between two or more explanatory variables in a model. Although multicollinearity does not influence the explanatory and predictory power of the model, current literature has addressed several consequences of multicollinearity, including overestimating standard errors of coefficients and classifying explanatory variables as insignificant ones. The corrections

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62 In fact, the unreported Durbin-Watson statistics indicate that two out of the 21 counties (cities) are proven to have no serial correlation residuals, while the rest 19 counties (cities) have Durbin-Watson statistics fall in the inconclusive area — close to the critic value of no-serial correlation.

63 Kezdi (2003) and Petersen (2009) argue that estimates that are robust provide more unbiased and consistent estimates than the ordinary least square, fixed effect ones. However, they also mention that there is no distinguished difference between the robust standard errors and ordinary least square errors during short time periods. It is not clear whether or not 16-year is considered a short time period.
between all variables, including all predetermined variables in the first stage equation, are shown in Table 25.

There are three sets of variables that need to be considered: CATR and W (0.79), CATR and OG (0.78), and CATR and W and OG (0.82). In order to detect the potential threat of the model, the Variation Inflation Factor (VIF) is adopted. Although O'Brien indicates that one has to be cautious when using VIF because the data set properties may suggest that including high VIF-statics variables is necessary (O'brien, 2007), VIF is still the most commonly used approach to detect collinearity. The results of the VIF test are shown in Table 26. In the instrumental equation, we are interested in prediction rather than inference on the specific instrument so multicollinearity is generally not of concern, but the VIF statistics for the first stage equation is still presented in Table 26. According to the rule of thumb of 10, as suggested by Chatterjee, Hadi, & Price (2000) and Kutner,

<table>
<thead>
<tr>
<th></th>
<th>E</th>
<th>CATR</th>
<th>t1CATR</th>
<th>( \hat{Y} )</th>
<th>t1( \hat{Y} )</th>
<th>W</th>
<th>OG</th>
<th>OR</th>
<th>BO</th>
<th>CATR _pre</th>
<th>OLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CATR</td>
<td>0.79</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t1CATR</td>
<td>0.60</td>
<td>0.52</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \hat{Y} )</td>
<td>0.08</td>
<td>-0.26</td>
<td>0.13</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t1( \hat{Y} )</td>
<td>0.26</td>
<td>0.06</td>
<td>0.69</td>
<td>0.50</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>0.91</td>
<td>0.79</td>
<td>0.61</td>
<td>0.06</td>
<td>0.30</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OG</td>
<td>0.88</td>
<td>0.78</td>
<td>0.51</td>
<td>-0.21</td>
<td>0.11</td>
<td>0.82</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>-0.07</td>
<td>-0.50</td>
<td>-0.15</td>
<td>0.62</td>
<td>0.14</td>
<td>-0.08</td>
<td>-0.34</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BO</td>
<td>-0.06</td>
<td>0.02</td>
<td>-0.41</td>
<td>-0.25</td>
<td>-0.54</td>
<td>-0.10</td>
<td>-0.03</td>
<td>-0.10</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CATR _pre</td>
<td>0.72</td>
<td>0.82</td>
<td>0.53</td>
<td>-0.28</td>
<td>0.09</td>
<td>0.74</td>
<td>0.76</td>
<td>-0.46</td>
<td>-0.06</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>OLD</td>
<td>0.27</td>
<td>0.10</td>
<td>0.72</td>
<td>0.36</td>
<td>0.83</td>
<td>0.32</td>
<td>0.16</td>
<td>0.05</td>
<td>-0.06</td>
<td>0.16</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Table 26: Test for Variation Inflation Factor

<table>
<thead>
<tr>
<th>Variable</th>
<th>Stage 1: CATR</th>
<th></th>
<th>Stage 2: E</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VIF</td>
<td>1/VIF</td>
<td>VIF</td>
<td>1/VIF</td>
</tr>
<tr>
<td>$t_1\hat{Y}$</td>
<td>9.47</td>
<td>0.11</td>
<td>W</td>
<td>9.01</td>
</tr>
<tr>
<td>OLD</td>
<td>8.84</td>
<td>0.11</td>
<td>CATR</td>
<td>6.01</td>
</tr>
<tr>
<td>W</td>
<td>6.42</td>
<td>0.16</td>
<td>OG</td>
<td>4.97</td>
</tr>
<tr>
<td>OG</td>
<td>4.96</td>
<td>0.20</td>
<td>$t_1\hat{Y}$</td>
<td>3.69</td>
</tr>
<tr>
<td>CATR_pre</td>
<td>3.61</td>
<td>0.27</td>
<td>$t_1$CATR</td>
<td>3.58</td>
</tr>
<tr>
<td>$\hat{Y}$</td>
<td>2.46</td>
<td>0.40</td>
<td>OR</td>
<td>3.03</td>
</tr>
<tr>
<td>OR</td>
<td>2.30</td>
<td>0.43</td>
<td>$\hat{Y}$</td>
<td>2.37</td>
</tr>
<tr>
<td>BO</td>
<td>1.47</td>
<td>0.68</td>
<td>BO</td>
<td>1.46</td>
</tr>
<tr>
<td>Average VIF</td>
<td>4.94</td>
<td></td>
<td>Average VIF</td>
<td>4.27</td>
</tr>
</tbody>
</table>

Neter, & Nachtsheim (2004), as well as many other empirical researchers, VIF-statistics indicate that multicollinearity is not an urgent threat to the model. Although following the rule of 10, the model suggests that there is no urgent threat of collinearity, $W$ and $CATR$ have VIF statistics close to the cutoff value. As such, this dissertation uses the current model to detect the flypaper effect and acknowledges this potential threat as an issue of the model.

**Data Description**

Financial information used to examine the expenditure impacts was from each year’s Audited Final Account Reports, published by the Ministry of Audit of Taiwan. Although it is not guaranteed that a unified set of accounting standards was adopted across all local

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64 While VIF is widely used in detecting multicollinearity, there is not general agreement on the critical value of VIF. The rule of thumb of 10 has been adopted in empirical literature (Hair, Anderson, Tatham, & Black, 1995; Kennedy, 1992; Kutner, Neter, & Nachtsheim, 2004; Marquardt, 1970; Menard, 1995; Neter, Wasserman, & Kutner, 1989), but there are still some concerns about it. First, other literature indicates a lower cut-off value of VIF, for example, the cutoff value of 5 is commonly used (O’Brien, 2007). Some literature has argued that the 10 cut-off value is too high (Cohen, Cohen, West, & Aiken, 2003, p. 423). The other concern is about the panel data. As Hsiao (2003) indicated, panel data can easily “increase degrees of freedom, and lessen the problem of multicollinearity” (Hsiao, 2003, p. 311). The column 1/VIF presents the “tolerance” (TOL) of collinearity. The rule of thumb is that any TOL below 0.1 indicates a problem of collinearity, although some literature uses the criteria of 0.2.
audit offices, numbers on audited reports reflect the most accurate and standardized local financial information. The exception for financial information used in this examination is the personnel expense (W) for the period of 1992-2001, which is from the local Final Account Reports, published by each local DBAS. The primary reason for using this unaudited information is because audited personnel expenses for the above mentioned period are not presented on audited reports or other related records for that period. The adoption of unaudited local personnel expenses should be a minimal threat to data accuracy, since the estimates for personnel expenses have uniform and explicit regulations and guidelines.

The data set is composed of 21 counties and cities across 16 years, from 1992 to 2007. Financial data are converted to per capita (per person) terms in order to avoid the possible influence of the population factor. The data are considered in constant value at year 2007 instead of a nominal value to prevent possible interventions from inflation. This dissertation uses the Consumer Price Index (CPI), reported by the highest budgeting and statistics authority in Taiwan, the Directorate-General of Budget, Accounting, and Statistics (DGBAS). The government’s expenditure price index may provide a better tool to inflate earlier financial data, but this information is not reported in Taiwan. Dollar values are in New Taiwan Dollars ($NTD). Finally, as previously mentioned, fiscal year 2000 was comprised 18 months in order to change the fiscal year from July-June to January-December. In the dataset, fiscal data for year 2000 was adjusted to 12 months by dividing those numbers by 1.5. This is the official and formal approach used by DGBAB to adjust 18-month financial data in Taiwan. To test if this adjustment is appropriate, the

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65 For example, the State Revenue Report series published by the Nelson A. Rockefeller Institute of Government uses “local government expenditures” as an input to calculate the price index for the same purpose.
data detect the existence of outliers using *Grubbs’ Text* (Grubbs, 1969). Four observations are found to be outliers: Nantou, 2001 and Taichung, 2001 (extremely high CATR); Nantou, 2007 (extraordinary covariance between E and CATR); and Tainan, 1992 (extremely low CATR). Observations for the year 2000 are all confirmed as not being outliers. Descriptive statistics, data sources, and definitions of variables that were used in the estimate model are presented in Table 27.

The dependent variable \( E \) is defined as the general expenditure, simply because the CATR funds are supposed to be spent on the general expenditure. The definition of the CATR variable is straightforward — the CATR funds the county (city) receives. Variable \( W \), personnel expenses, refers to expenses on salaries of formal civil servants, basic office maintenance payments, and overtimes payments of formal police officers and firefighters. The definition \( W \) is adopted from the *Distribution Regulation of CATR Funds*. Private income variable \( Y \) is defined as annually personal expendable income, calculated as annual household expendable income divided by the average number in a household. In the model, private income is defined as \( r^*Y \), where \( r \) is the weighted average local tax rate. Grants variable \( OG \) does not distinguish between general grants and matching grants simply because the distinguished data for some years are not reported. The variable of other revenue, \( OR \), refers to other non-tax revenue of each county or city on the current account, including administrative fees, traffics fines, or other charges. Capital revenue is not included in the current account budget. \( BO \), borrowed revenue, was removed from the current account reports in year 2000. In the current budget framework, borrowed revenue may not be used to support regular basis expenditures.
### Table 27: Descriptions of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable Definition &amp; Data Source</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATR</td>
<td>CATR: county (city) received CATR funds. Amounts reflect SNTD, in per capita term, and on the 2007 dollar values adjusted by Taiwan CPI. <strong>Data Source</strong>: County (city) Audited Final Account Reports, 1992-2007.</td>
<td>332</td>
<td>5548.85</td>
<td>4364.58</td>
<td>231.70 (Tainan City, 1992)</td>
<td>337,29.17 (Peng-Hu, 2000)</td>
</tr>
<tr>
<td>W</td>
<td>Personnel Expenses: county (city) Personnel expenses of formal civil servants and basic office expenses, and overtime payments of formal police officers and fire fighters. Amounts reflect SNTD, in per capita term, and on the 2007 dollar values adjusted by Taiwan CPI. <strong>Data Sources</strong>: County (city) Final Account Reports, 1992-2001; Audited Final Account Reports, 2002-2007.</td>
<td>332</td>
<td>169,06.34</td>
<td>6299.69</td>
<td>758.47 (Taipei, 1992)</td>
<td>561,01.16 (Peng-Hu, 2000)</td>
</tr>
<tr>
<td>Y</td>
<td>Private Income: personal expendable income, calculated as household expendable income numbers in household values adjusted by Taiwan CPI. <strong>Data Source</strong>: Data is based on Annual Survey on Family Income, 1992-2007, published by DGBAS.</td>
<td>332</td>
<td>272,09.820</td>
<td>42776.33</td>
<td>168,534.71 (Peng-Hu, 1992)</td>
<td>446,682.90 (Hsin-Chu City, 2007)</td>
</tr>
<tr>
<td>OR</td>
<td>Other Own-source Revenue: county (city) non-tax self-raised revenue. Amounts reflect SNTD, in per capita term, and on the 2007 dollar values adjusted by Taiwan CPI. <strong>Data Source</strong>: County (city) Audited Final Account Reports, 1992-2007.</td>
<td>332</td>
<td>101,07.64</td>
<td>4869.92</td>
<td>279,7.68 (Nantou, 1995)</td>
<td>268,15.55 (Hsin-Chu City, 2000)</td>
</tr>
<tr>
<td>BO</td>
<td>Borrowed revenue: local bonds and other financing revenue. Amounts reflect SNTD, in per capita term, and on the 2007 dollar values adjusted by Taiwan CPI. Since 2000, BO has not listed in and regarded as local government’s general account. <strong>Data Source</strong>: County (city) Audited Final Account Reports, 1992-2007.</td>
<td>332</td>
<td>347.47</td>
<td>633.39</td>
<td>0</td>
<td>497,9.22 (Chia-I City, 1995)</td>
</tr>
</tbody>
</table>

**Note:** The numbers presented here reflected per capita New Taiwan Dollar (SNT) at the 2007 dollar value.
Results: Expenditure Impacts of the CATR Program

Overview

This chapter is centered on the second research question, examining the expenditure impact of the CATR program. In addition to detecting the existence of the flypaper effect, the research question also deals with the influence of the transformation of the CATR program in 2000. A quasi-experimental approach is utilized to assess CATR’s expenditure impact before and after the 2000 reform. CATR funds and general expenditures are interdependent in the model, and therefore the Two-Stage Least Square technique is applied to account for the endogenous issue of the CATR variable.

The data consist of 21 counties (cities) over a period of 16 years, from 1992 to 2007, and after removing four outliers from the sample, there are 332 observations. Data are transferred into per capita terms to take population into consideration and converted to the 2007-dollar value to reflect real fiscal information. Fiscal data for year 2000 consist of 18 months of information, and for consistency reasons, it is adjusted to the 12-month basis by dividing by 1.5. A fixed effect is used to control for unobserved time and unit interventions in this panel data set.

This section presents estimated results of the model (Eq.7):

\[ E_k = \alpha_0 + \alpha_1 CATR_k + \alpha_2 \bar{Y}_k + \alpha_3 t CATR_k + \alpha_4 t \bar{Y}_k + \alpha_5 W_k + \alpha_6 OG_k + \alpha_7 OR_k + \alpha_8 BO_k + \varepsilon_k \]

With the first stage that deals with the endogenous CATR variable (Eq.8):
\( CATR_k \)

\[ = \beta_0 + \beta_1 CATR_{pre} + \beta_2 OLD \]

\(+ f(\text{all independent variables in Eq.7 except for CATR and } t_1 CATR)\)

is used to test for the two hypotheses:

- **Hypothesis 1:** The allotted tax revenue funds have a flypaper effect
- **Hypothesis 2:** The transformation of the distribution from a discretionary process to a formula-based process has an impact on local spending.

**Analytical Strategy**

The first hypothesis is operationalized by using Eq. 7 to detect the flypaper effect. The coefficients of CATR variables are compared with the coefficients of private income variables. Significantly larger coefficients on the CATR variable than on the private income variables are considered to show the existence of the flypaper effect, which means local governments spend more money than they should because of CATR funds. In mathematical terms, the null hypothesis is:

\[ H_0^1: \alpha_1 = \alpha_2 \text{ in period one (1992-1999) and } \alpha_1 + \alpha_3 = \alpha_2 + \alpha_4 \text{ in period two (2000-2007)} \]

This null hypothesis states that there is no flypaper effect of the CATR program. An F-test is employed to test the null. Rejection of the null indicates the existence of the flypaper effect is detected, and vice versa.

Similar to most models adopted by current empirical studies, the coefficient \( \alpha_1 \) represents the expenditure impact of the CATR funds, while the model of this dissertation indicates that \( \alpha_3 \) specifies the difference in the expenditure impact of the pre- and post-
allotted tax revenue program. Therefore, an easy way to identify the existence of the flypaper effect should be to compare \( \alpha_1 + \alpha_3 \) with \( \alpha_2 + \alpha_4 \) while in the period 1992-1999, \( \alpha_3 t_1 = \alpha_4 t_1 = 0 \); this is actually the comparison between \( \alpha_1 \) and \( \alpha_2 \).

The second question of this chapter deals with is the existence of the “additional” impact of the CATR as a result of the transformation of this program from a discretionary to a formula-based one in 2000, as stated in Hypothesis 2. Putting it in the null hypothesis:

\[ H_0^2: \alpha_4 = 0 \]

This null hypothesis is testing through t-test on the \( t_1 \text{CATR} \) variable. A rejection of accepting the null indicates that the transformation of the CATR program has essential additional impacts on the general spending, and vice versa. \( \alpha_4 = 0 \) indicates the transformation of the CATR program does not have significant impact on the general expenditure, \( \alpha_4 > 0 \) implies the formula-based CATR funds stimulate more expenditures than discretionary funds, and vice versa.

**Results**

Table 28 presents the coefficients of each explanatory variable as well as the robust standard errors. Model I presents results of the first-stage estimate, which is designed to instrument the CATR variable. In the first stage model, the instrumental variables have significant impact on the CATR variable — CATRpre is significantly recorded at 0.11 (p-value = 0.07) and OLD is significantly recorded at 90.86 (p-value = 0.06). These significances prove that they are good instrument to the CATR variable. In Model II, all but \( t1 \text{CATR} \) and \( t1 \hat{Y} \) are significant. Most of the other covariates are significant at the 99% confident interval (p-value \( <=0.01 \)). The variable of \( t1 \hat{Y} \) is significant (p-value = 0.1)
Table 28: Estimate Results of CATR Impacts (2SLS Estimates, Fixed Effect) with Robust Standard Errors

<table>
<thead>
<tr>
<th>Dept. Var.</th>
<th>Model I: 1st Stage</th>
<th>Model II: 2nd Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cons.</td>
<td>CATR</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>-625.69</td>
<td>-8801.571**</td>
</tr>
<tr>
<td></td>
<td>(1141.153)</td>
<td>(1587.49)</td>
</tr>
<tr>
<td>CATR</td>
<td>-</td>
<td>1.06**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.32)</td>
</tr>
<tr>
<td>t1CATR</td>
<td>-</td>
<td>-0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.07)</td>
</tr>
<tr>
<td>Ý</td>
<td>0.37**</td>
<td>0.83**</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.24)</td>
</tr>
<tr>
<td>t1Ý</td>
<td>0.01</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.08)</td>
</tr>
<tr>
<td>W</td>
<td>0.31**</td>
<td>0.74**</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.20)</td>
</tr>
<tr>
<td>OG</td>
<td>&lt; 0.01</td>
<td>0.47**</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.08)</td>
</tr>
<tr>
<td>OR</td>
<td>-0.22**</td>
<td>0.83**</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>BO</td>
<td>-0.07</td>
<td>0.76**</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.23)</td>
</tr>
<tr>
<td>CATRpre</td>
<td>0.11*</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td></td>
</tr>
<tr>
<td>OLD</td>
<td>90.80*</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(47.22)</td>
<td></td>
</tr>
</tbody>
</table>

1. Numbers in parentheses are standard errors.
2. **Indicates coefficients are statistically significant at 99% confidential level.
3. * Indicates coefficients are statistically significant 93% confidential level.

when using ordinary least square standard errors; however, the significance is not proven by the robust test.

Table 29 provides information about overall model performance. The first-stage estimate has a significant F-statistic as 18.74 (p-value < 0.01),\(^{66}\) which argues against the

\(^{66}\) The F-test is based on robust standard errors. With ordinary least square errors, the F-statistic is significant at 14.91 (p-value < 0.01).
Table 29: Model Performance

<table>
<thead>
<tr>
<th>Overall Model Performance</th>
<th>Model I</th>
<th>Model II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall $R^2$</td>
<td>$0.83$</td>
<td>$0.94$</td>
</tr>
<tr>
<td>Test for weak instrument</td>
<td>$F(8, 303) = 18.74$</td>
<td>-</td>
</tr>
</tbody>
</table>

use of weak instruments. The target mode has high $R^2 (R^2 = 0.94)$, which indicates the model fits data well, but high $R^2$ does not necessarily mean high forecasting power. The following description uses per capita New Taiwan Dollar (PCNTD).

**Detecting the Flypaper Effect**

Regarding the first hypothesis of the second research question of this dissertation:

- *Hypothesis 1: The allotted tax revenue funds have a flypaper effect.*

As presented earlier, the first hypothesis expects the existence of the flypaper effect for the CATR program. Through the results presented in Table 28, the expenditure impact of CATR funds on general spending is significantly recorded at 1.06 ($p < 0.01$), which means per dollar increase in CATR funds can stimulate an additional $1.06 on general spending. This stimulating level corresponds to the current empirical findings, which usually conclude that lump-sum aid stimulates an additional $0.5$-$1.7$ on local spending (Becker, 1996; Case, Rosen, & Hines, 1993; Gamkhar & Oates, 1996; Grossman, 1990; Knight, 2002; Helen F. Ladd, 1993; Strumpf, 1998). On the other hand, the private income variable $Y$ has significant expenditure induce power at 0.83 ($p$-value $< 0.01$). A per capita one-dollar increase in the taxable private income of residents may lead to an $0.83$ increase on general spending.

---

68 A rule of thumb of the strength test for instrumental variables of the first-stage estimation is that the F-statistic should be significant and larger than 10 to reject the null of weak instruments. The criteria have been widely used in empirical analyses, but issues still remain. For example, Stock & Yogo (2005) found that the critical value of F-statistics increase as the instruments increase. They also argued that it is not easy for a just identified first-stage equation to conclude $F$-statistics $> 10$. 

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The magnitude of the CATR coefficient is larger than the coefficient of $\hat{Y}$, while the test for the null hypothesis shows that:

$$H_0^1: \text{for the pre-formula period, } \alpha_1 = \alpha_2, \text{ for the post formula period, } \alpha_1 + \alpha_3 = \alpha_2 + \alpha_4$$

cannot be rejected ($F$-statistics $= 0.26$, $p = 0.61$ and $F$-statistics $= 0.01$, $p = 0.94$, respectively). $^{69}$ The expenditure inducing effect of taxable private income and CATR funds are found to be equivalent. This result indicates that the existence of the flypaper effect is not supported by the statistical tests.

Regarding the second hypothesis of research question 2:

- Hypothesis 2: The transformation of the distribution from a discretionary process to a formula-based process has an impact on local spending.

This hypothesis is the motivation for designing this quasi-experimental model. The treatment of the transformation of the CATR program is expected to change the way local governments use CATR funds. Although estimate results suggest that the use of a formula decreases the spending effect of the CATR program, this estimate is not supported by the statistical $t$ test. The testing null hypothesis: $H_0^2: \alpha_4 = 0$ cannot be rejected ($F$-statistics $= 1.28$, $p = 0.26$). The other interrupted factor, $t_1 \hat{Y}$ is recorded at 0.12 and is not significant ($F$-statistics $= 2.30$, $p = 0.13$). These results indicate that during the period 2000-2007, taxable income and the CATR program had no additional impact on the general spending. As previously mentioned, the treatment of “new tax structure” has an additional impact on local spending, but the treatment of “using formulas” of the CATR program does not affect local spending.

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$^{69}$ With non-robust standard errors, the $p$ values decline, but are still above the acceptable level of 0.1.
As a result, the two hypotheses are not proven to be true, and with regard to the research question 2: “How do local governments respond to the received CATR funds? In particular, does the Taiwanese CATR program lead to the appearance of the flypaper effect on local spending, and does the distribution formula enhance this effect or weaken it?”

Answers are: (1) there is no evidence to support the appearance of the flypaper effect; (2) the transformation of the CATR program does not change local governments’ spending behavior.

**Other Variables**

All other variables are significant at a high confidence level, with signs corresponding to the current literature. The proxy of basic level public service and local socioeconomic situation, $W$, has a significant marginal expenditure impact at 0.74 ($p < 0.01$). An estimate result of other grant, $OG$, shows that one per dollar of grants from the central government increases 0.47 extra dollars of general expenditures ($p < 0.01$). Although the portion is not large, $OG$ includes both lump sum and categorical grants. A matching grant is usually expected to have both income and price effects, while the lump sum grant is considered to have an income effect only. If data were available, these two types of grants would have to be distinguished. Non-tax own source revenue, $OR$, is estimated to stimulate $0.83$ in general expenditures ($p < 0.01$). Non-tax own source revenue includes fees, charges, and fines, which is not directly related to taxable income. Finally, the borrowed revenue ($BO$) has expenditure effects recorded at 0.76 ($P < 0.01$). Since 2000, $BO$ has not been reported as a revenue source in the current account, and the legal framework has limited the use of $BO$ to capital expenditures only. The high expenditure stimulus effect
of BO implies a heavy reliance on borrowed revenue in previous times, when local governments were considered not autonomous enough.

**Conclusion**

This chapter is organized around the second general research question — detecting the flypaper effect of the CATR program and the change of expenditure impacts (if any) due to the different distribution approach of the allotted tax revenue program. Current literature has provided several explanations regarding the existence of the flypaper effect, and several empirical studies also have found evidence to support the existence of it. Among the theoretical arguments, the fiscal illusion perspective lends the most support to the existence of the flypaper effect. This theory argues that a revenue sharing program can easily create an impression that tax burdens are shifted from people in other jurisdictions (R. M. Bird & Smart, 2002), while the funding pool is actually all residents’ tax payments. This misperception results in increased general expenditures. From the empirical perspective, CATR receipts are determined by the gap between basic financial needs and basic financial revenue. This determination process creates an incentive for local politicians to enlarge the financial gap by spending more — since under the current tax framework they cannot tax less. The theoretical argument and the special institutional arrangement of the CATR program both suggest the existence of the flypaper effect of this program.

This chapter adopts Nagamine’s (1995) institutionalized expenditure model to analyze the CATR program. The institutional factor refers to lack of a participatory mechanism on the budgetary process and that local governments have no discretion over tax rates. First, Nagamine argues that local budgetary decisions are made within government. He uses
local politicians’ behavior model rather than the median voter model to explain the expenditure choices at the local level government in Japan. Second, local governments in Japan do not have discretion over tax rates, and therefore the tax rate should be considered an exogenous factor, independent from the private income variable. Under these two institutional differences, Nagamine developed a Japanese-type (or institutionalized) flypaper effect model. Taiwan’s local finance shares the two above-mentioned features with Japan, and the CATR program is similar to Japan’s LAT program. Nagamine’s (1995) model provides a framework for the CATR program, but some revisions have been made to fit the model to Taiwan and the CATR program.

The first revision is the inclusion of two interrupted dummy variables that enable examinations of the different patterns (if any) of local government spending as a result of the 2000 CATR transformation. The second revision involves the use of the taxable private income variable in the equations. Nagamine uses the unadjusted private income variable in his model, and then he adjusts the estimated coefficient of the income variable with a fixed tax rate. His approach assumes the local tax rate is the same over the sampled year; however, this dissertation cannot accept this assumption since Taiwan’s (weighted) average local tax rates varied over the 16 years. The third difference between Nagamine’s model and the model used in this dissertation is the way the revenue sharing variable is utilized. This revision reflects the difference in the distribution process between the LAT and the CATR program. For example, Nagamine claimed that “land area per capita” is an important determinant of LAT distribution, but this variable is irrelevant to the CATR distribution. Instead, through the theoretical and empirical literature, the instruments for the pre- and post-formula CATR should be distinguished.
As suggested by the literature that discretionary transfers usually involves politics, while the formula-driven program can achieve equalization purposes, this dissertation use two instruments to explain the endogenous variable CATR. The elderly percentage variable is set to instrument the post-formula CATR funds, since the elderly pension is a component of the basic financial need in the distribution formula. The previous CATR level describes the incremental nature of a governmental budget; the politics of an incremental budget are suggested by Niskanen (1971). The estimated results also show that the instruments are significant (p-value = 0.06 of OLD and 0.07 of CATR<sub>pre</sub>).

The results on the substantive model (Model II in Table 28), however, show no statistical evidence to support the existence of the flypaper effect on the county (city) general expenditures in Taiwan. Although the expenditure induced effect corresponds to most of the existing empirical literature, taking institutional factors into consideration led to completely different results. This finding is contrary to most of current empirical findings. It also lends no support to Melo’s (2002) argument that the presence of the flypaper effect is associated with the level of dependence on the intergovernmental transfer of the local government. CATR funds comprised about 25 percent of county (city) total revenue, but the result indicates the flypaper effect is inexistent. This result, although contradictory to several existing findings, provides evidence that local governments treat received CATR funds as their own-tax revenue, which is actually the goal of the program.

70 Applying the same estimating process and techniques, using the unadjusted private income in the model, the result indicates that a per dollar increase in the private income stimulates only $0.01 of extra general spending. The statistical test on the equivalence text of CATR and Y concludes that CATR has a significantly larger stimulus effect than Y (p-value =0.03). Therefore, by using the unadjusted income variable, the flypaper effect would be easily discovered.
The intent of the CATR program is to reduce horizontal fiscal imbalance by increasing local governments’ available resources by shifting revenue from the richer to the poorer. The empirical findings show that CATR funds have essentially the equivalent expenditure effect as the taxable income variable. This suggests that the funds are treated exactly as what they should be, since local governments are required to report the received CATR funds as own-tax revenue. Neo-classical economics suggest that the existence of the flypaper effect indicates inefficiency, so from this perspective, local governments in Taiwan use CATR funds in an efficiently. However, this does not necessarily mean the current CATR program is the best it could be. The second finding of this dissertation indicates that the current distribution approach is no different from pre-formula program.

The measure of different impacts between the pre- and post-formulating allotted tax revenue program provides no evidence in support of the second. This finding indicates that while a distribution formula makes CATR receivables more stable and predictable, it does not change local governments’ spending behaviors. One possible reason could be because many local governments still do not have enough resources to spend more. With limited resources, the flypaper effect is not possible. The other reason could be because the grant distribution still involves political interventions, although the distribution formula is written explicitly in the regulation. The significance of the CATR_{pre} variable in the first-stage model (Model I in Table 28) proves that considerations other than equalization and efficiency remain. For example, although the CATR distribution has been made through a formula, the incremental nature of this program still exists. The evidence for this is the high correlation coefficient between the post-formula CATR_{pre} and t_{1}CATR (\rho =0.91). As noted by Niskanen (1971), the incremental budget implies
calculations and cooperation in the budgetary process, which make the process political. When the CATR distribution process involves political considerations, local governments do not have full discretion over the use of the funds, so the formula-based CATR ultimately does not differ from the discretionary program. The spending behavior is therefore unchanged.
Chapter Six: Local Financial Accountability

Background

Current literature indicates that local accountability is hard to achieve in unitary countries (Litvack, Ahmad, & Bird, 1998; J. A. Rodden, 2002; Seabright, 1996; Wade, 1997). The development of fiscal decentralization in these countries has also been reported as cultivating weak fiscal discipline and poor expenditure management (Baltaci & Yilmaz, 2007). The primary reason for this is that monitoring and auditing are more intense in the national government than in the local governments (Brueckner, 2000; Tabellini, 2000; Tanzi, 1996). Intergovernmental transfers are an integral part of the fiscal decentralization in unitary countries, but Khemani (2007) argues that the over-dependency on intergovernmental transfers of local governments undermines local accountability. A securitization on the accountability system is an important part of the evaluation of fiscal decentralization in unitary countries.

Legally, there is no overlapping responsibility between national and local governments in the arrangement of CATR funds. The national government is merely responsible for distributing funds to local jurisdictions based on the Distribution Regulations, and local governments take full responsibility for the use of funds. Although the accountability principal and agent are clearly distinguished, it is not possible to hold local governments specifically responsible for CATR usages. The primarily reason for this is that there is not a separate account for CATR funds in the budgetary documents. CATR receipts are considered local general tax revenue, and thus it is not easy to distinguish these funds from other general funds or to evaluate its efficiency and effectiveness individually.
Evaluating the accountability of local general funds is actually the same as evaluating the CATR funds. Therefore, in this chapter, the evaluation target is set as local general funds.

**Overview**

This chapter presents the results of the field study conducted in Taiwan on the mechanism used to ensure financial accountability in municipal and county (city) governments. The evaluation on that accountability mechanism is based on the IMF 2007 Code of Good Practices on Fiscal Transparency. IMF implemented these codes in 1999 to provide a comprehensive fiscal accountability assessment tool for member countries. As of today, more than 100 countries have completed their Reports on the Observance Standards and Codes (ROSCs) of fiscal transparency by using the IMF codes. The U.S. Treasury Department notes that IMF codes “help to ensure that a sufficiently complete picture of the structure and finances of government is available.” IMF codes specify four major aspects of financial accountability. First, the roles and responsibilities among different levels of governments and among different branches should be clearly stated and implemented. Second, the budget process, from start to finish, should be transparent. Third, financial information should be publicly accessible. Finally, the oversight mechanism should ensure its integrity.

The evaluation result presented in this chapter is implemented twofold — from the legal perspective and from the implementation perspective. Multiple methods were employed, including through semi-structured interviews, reviews on laws, regulations, governmental documents, and governmental websites. Interviewees from local DBAS, DOF, and audit offices participated.

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71 [http://www.ustreas.gov/offices/international-affairs/standards/code02.shtml](http://www.ustreas.gov/offices/international-affairs/standards/code02.shtml)
Twenty-three jurisdictions were classified into four groups based on relative financial dependency. Jurisdictions ranked in level one included Taipei M., Taichung C., Hsinchu C., Tainan C., and Taoyuan; level two included Taipei, Kaohsiung M., Hsinchu, Taichung, Keelung C., and Chiayi C.; level three included Kaohsiung, Tainan, Yilan, Miaoli, Yunlin, and Changhua; and level four included Pingtung, Chiayi, Hualien, Nantou, Taitung, and Penhu. Interviewees were 20 officials from local DBAS, DOF, and audit offices from the four jurisdictions levels; interviewee codes are presented in Table 30. Several interviews were conducted in person. Interviewees No. 4 and 14 were interviewed by phone, and almost all interviewees from the audit office (Interviewees No. 15 through No. 20) were interviewed through email or instant message software. Interviewee No. 21 is from a central agency under the Ministry of Audit. Early responses regarding participation were received in late November 2008. The interviews started in December 2008 and ended in March 2009.

Table 30: Codes of Interviewees

<table>
<thead>
<tr>
<th>Level</th>
<th>Jurisdiction</th>
<th>DBAS</th>
<th>DOF</th>
<th>Audit Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>A</td>
<td>1</td>
<td>7 and 8</td>
<td>14</td>
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<tr>
<td></td>
<td>B</td>
<td>2</td>
<td>9</td>
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<td></td>
<td>C</td>
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<td>15</td>
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<td></td>
<td>D</td>
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<td>16</td>
<td></td>
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<tr>
<td>Two</td>
<td>E</td>
<td>3 and 4</td>
<td>10 and 11</td>
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<td></td>
<td>F</td>
<td></td>
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<td>Three</td>
<td>J</td>
<td>6</td>
<td>12 and 13</td>
<td>20</td>
</tr>
</tbody>
</table>

72 Municipality is denoted as M. and city is denoted as C.; others are counties. The classification is based on financial dependency, defined as the share of total revenue that is from intergovernmental transfers. Financial data used to measure the dependency are from 1998 to 2007.
**Clarity of Roles and Responsibilities**

They are crucial as a basis for assigning accountability for the design and implementation of fiscal policy. Identification of all those entities that provide a public good or service provides the public with an understanding of the true scope of government. A legal and administrative framework that clearly assigns the roles and responsibilities of government in the collection and use of public resources promotes accountability and good governance.


In the legal framework, the responsibilities and relationships of different levels and branches of governments are generally specified. Local revenue management is governed by a clear and understandable legal framework. All major taxes have a corresponding law and the tax codes are accessible to the public. Local governments issue announcements when a new tax is implemented. However, in practice, some expenditures (responsibilities) of different levels of governments are not clearly defined. Although the integrity of local finances is insured by the Constitution and through laws, the heavy reliance on intergovernmental transfers makes the national government dominant over some local fiscal activities.

Institutional arrangements for undertaking fiscal activities are generally clearly defined in the legal framework. The coordination and management of fiscal activities are fairly effective, but in jurisdictions with disadvantaged financial conditions, the revenue agency (DOF) might be involved in expenditure plans. Further, compared to the numerous laws and regulations related to the national government’s budget and final account preparations, general rules and regulations for local governments are limited. Nevertheless, local governments claim that the annual directions for budget and financial statement preparations are enough to compile local budget and financial statement reports.
Three of the 23 counties (cities) have their own handbooks for preparing general budget reports. However, local financial accountability may be fragile if there are not comprehensive budgetary laws and regulations designed specifically for local governments.

**Among Different Levels of Governments**

Tasks and responsibilities of separate governmental institutions are defined in the Constitution and specific organizational regulations (see the Organic Act). The integrity of local finances is ensured by the Local Government Act. Intergovernmental fiscal relations are governed by the Law Governing the Allocation of Government Revenues and Expenditures (hereafter referred to as the *Allocation Law*) and Local Government Act. Revenue authority and expenditure responsibilities of different levels of government in relation to budgetary affairs are defined in the *Allocation Law*, which has resulted in a clearly defined taxing power but a relatively vague description of expenditure responsibilities. Intergovernmental transfers are governed by *Distribution Regulations of Centrally-Allotted Tax Revenue* and *Regulations for Subsidies from the Central Government to the Municipalities and County (City) Governments*. Under the current legal framework, responsibilities between the central government and local governments sometimes overlap. Additionally, the financial relationship between the central government and the county level government is one of dominance-dependency rather than assistance.

Tax authorities of different levels of governments are clearly defined in the *Allocation Law*. Most local taxes have related tax acts and enforcement rules for them. CATR and intergovernmental grants are stipulated in accordant regulations. The Local Tax Act
identifies the scopes, limitations, and administrative procedures of local discretionary taxes. Laws and regulations related to local tax collections are easily accessible, stable, clearly defined, and understandable. Non-tax revenue is also clearly stated in announcements issued by local jurisdictions in their governmental websites. In practice, from the perspective of implementation, all interviewees confirmed that those laws and regulations are easily followed.\(^\text{73}\)

In contrast to the clear description of local taxation power, current laws and acts do not provide local governments with well-defined expenditure responsibilities.

There have been a lot of problems with our budget and finances. The *Allocation Law* does not clearly distinguish expenditure responsibilities among the central, county, and township governments. Therefore, you should not feel surprised if one road is fixed three times in a year. Different levels of governments do the same thing, and the result is the waste of resources. The same problems occur with police and social welfare expenditures. Also, it does not make sense that we (county governments) have to share in the cost of national health insurance.\(^\text{74}\) The *Allocation Law* arranges revenue authority distinctly but defines expenditure responsibilities vaguely. I guess this is the biggest problem of local autonomy, and the *Allocation Law* is the problem.

—Interviewee No. 10

In the *Allocation Law*, local expenditures are categorized rather than itemized, and definitions of each expenditure category are in general terms. This results in the overlap

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\(^73\) All interviewees argued that the current *Allocation Law* is unfair to local governments and the *Local Tax Act* puts too many restrictions on local discretionary taxes. They contended that the two laws have negative impacts on fiscal decentralization, since the *Allocation Law* gives the central government absolute advantages in tax collections, and the *Local Tax Act* makes discretionary taxes the most difficult approach to increase local revenue.

\(^74\) There have been several debates on who should be responsible for the National Health Insurance (NHI) program in Taiwan. According to the Amendment of the Constitution, implementing NHI shall be considered a country/nation’s obligation. While municipal and county (city) governments argue the country or nation should refer to the central government, the Executive Yuan explains that a county or nation should refer to all public sectors, including both central and local governments. Besides, local governments argue that the implementation of the NHI program is approved in the Legislative Yuan as a responsibility of the central government rather than local level governments. The Executive Yuan then cited the explanation provided by the Judicial Yuan stating that taking care of residents is a major responsibility of local governments, and the NHI program should be used for this purpose.
between levels of governmental functions, which complicates local financial accountability.

In addition, local governments have autonomous power and their own responsibilities, except when money comes from the central government. The Regulations for Examining the Plans and Budget of County (City) Governments in Taiwan Province set the standards for the national government to inspect the usage of granted funds. All interviewees complained that the above regulation makes the lump sum grant (or general grant) a control mechanism rather than an assistance program. Intergovernmental transfers from the national to municipal and county (city) governments include CATR, general grants, and categorical grants. Unlike categorical grants, which need local governments to prepare some portions of the disbursements for a specific program, the general grant is considered a fund from the central government to subsidize anything. However, in practice, Interviewee No.2 argued that:

The central government does not intervene in our budget because the budget is considered our affair, except for the part that is funded by the central government. Intergovernmental grants include general grants and categorical grants. Theoretically, general grants, once received, are considered our general fund and can go to anywhere we think it should go. However, the central government attaches a memorandum with the general grant, which lists “expectations” regarding how they think the grant should primarily be used.

Moreover, although CATR funds are considered local government’s own source revenue, the central government distributes the funds. As stated in the fourth chapter, the definition of basic financial needs and estimates of basic financial revenue are made by the Ministry of Finance. In this sense, the central government takes an absolutely dominant role in the local finances it funds.

The central government views CATR funds as their bargaining chip, but
they never consider that the law only gives them the power to redistribute. CATR funds are our own source revenue. The program is justified on achieving horizontal equalization, but at least 14 counties (cities) can claim they have insufficient CATR funds to support basic financial needs. The reason behind this is simple — the central government does not want big counties to be unhappy.

—Interviewee No. 2

Some interviewees indicated that some of the policies made by the national government deteriorate local finances. Article 91 of the Budget Act states that any legislation that significantly increases expenditures or reduces revenue should report to the Executive Yuan\textsuperscript{75} and indicate the corresponding resources that compensate the loss of revenue. However, this stipulation is often ignored. The first reason is because “significant increases of expenditure or reduces of revenue” are not explicitly stated in the regulation. Additionally, the central government has absolute power over defining the basic financial needs of local governments.

For example, the Physically and Mentally Disabled Citizens Protection Act approved by the Legislative Yuan, and this legislation has actually increased our expenditures. In accordance with Article 91 of the Budget Act, the central government promised to increase its general grants to compensate local governments. If you bear in mind that the general grant uses basic financial shortage as the estimated basis, you should also remember the central government is also in charge of defining basic financial income and basic financial payments. Therefore, when the central government increases our expenditures, they (the central government) simply redefine more revenue as our own source revenue. In this situation, they can assert they do not need to grant us that much.

—Interviewee No. 10

Finally, there are some problems associated with categorical grants, as well. The central government in Taiwan usually submits those programs to the Legislative Yuan without specifying the required portions that local governments need to match. Once the

\textsuperscript{75} Yuan is the supreme government agency in Taiwan. Its administrative status is equivalent to the executive branch in the United States government.
Legislative Yuan passes the program, the central government then estimates the matching rate based on the central government’s available revenue.

If they (the central government) found their revenue being tight, they increase the matching rate and never consider the financial conditions in local governments… what we can do is to squeeze some money from anywhere to qualify for receiving the categorical grants. In addition, when estimating CATR or general grants, the central government does not take the matching portion local governments have to achieve into consideration, while it is a necessary expenditure and should be included in the basic financial need.

—Interviewee No. 5

This interviewee pointed out some problems associated with the categorical grant, although the argument that the matching portion should be considered as basic financial need is arguable.

**Among Institutions**

Tasks and responsibilities of separate governmental institutions are defined in specific organizational regulations (see the *Organic Act*). Two local agencies are in charge of local financial and budget reports: the Division of Finance (DOF) reports revenue collections, and the Department of Budget, Accounting, and Statistics (DBAS) organizes and integrates revenue and expenditures and compile general budget reports and final account reports.

DOFs are responsible for collecting and integrating revenue estimates made by each agency and making mid-term revenue plans\(^{76}\) in April.\(^{77}\) DBAS (sometimes with the Research, Development, and Evaluation, or RD&E, Commission) develops the of policy guidelines for the budgeted year based on the mayor’s annual plan. Each April, DBAS

\(^{76}\) Taking Taipei Municipality as an example, the mid-term revenue plan refers to the estimates of revenue for following four years.

\(^{77}\) The current fiscal year for Taiwan’s central and local governments is January-December.
integrates the total estimated revenue and expenditures and develops principles of expenditures for the budgeted year. The mayor then determines the cap on each agency’s requested level of spending adjusted by the predicted financial condition of the budgeted year. Each agency revises their unit’s annual estimated budgets in accordance with the cap and submits the estimated unit budget to the Budget Commission. The local budget commission is a temporary committee group that meets every year and reviews local estimated budgets. It is usually composed of 8-10 people, including deputy mayors, secretary-generals, deputy secretary-generals, DOF and DBAS directors, the RD&E Commission, and the Chief of Personnel Office. Sometimes directors of agencies involved in important annual policy plans are invited. The Budget Commission reviews and examines estimated unit budgets, followed by the mayor’s revision. All agencies submit their unit budgets to DBAS, and DBAS integrates them into a consolidated annual budget proposal. The budget proposal is submitted to the local legislature for deliberation; the mayor has the obligation to present in the legislative deliberation. Figure 12 depicts the budget preparation process of general budgets in municipal and county (city) governments.

While the framework of the budget preparation is generally clear, the division of labor between institutions in some jurisdictions is not always distinguished. Interviewees No. 12 and No. 13 indicated that:

According to the Budget Act, DOF provides information about available revenue for DBAS to consider expenditure needs based on available resources. However, in our county, the expenditure need always exceeds available revenue. In this circumstance, when the financial shortage is more serious, we (the DOF) are forced to control for expenditures. [Asked: What do you mean by “control”?] When we cannot find any more resources, we search for a reconciliation with DBAS and ask them to reduce the total spending scale. We know we do not have the authority to
control for expenditure arrangements, but if a county has no money, reconciliation becomes common in poor jurisdictions.

This situation does not apply to all local jurisdictions, for example, some interviewees from level 1 and level 2 jurisdictions said this has never happened in their budget making process. This situation at least points out that financial condition is relevant to clear responsibilities among governmental agencies. In addition, although DBAS is independent from the local government system, according to Article 18 of Statutes for Establishment and Management of Budgetary, Accounting and Statistics Agencies and BAS Personnel, personnel in county and city DBAS are handled through the local DBAS itself. In practice, county (city) mayors have essential “suggestion authority” for DBAS personnel. The integrity of BAS system is not as complete as the audit system.

**Discussion: Local Budget Act**

The *Budget Act* and *Final Account Act* are designed primarily for the central government to prepare its annual budget and final account reports. Currently, these
acts are also applied to local governments simply because the regulations to local
governments have not yet been made, although Article 96 of the Budget Act and Article
31 of the Final Account Act stipulate that the central government should enact locally
specific budgetary acts or regulations. The Direction of County (City) General Budget
Compilation and Direction of County (City) Final Account Compilation are regulations
made by the national government on an annual basis to provide apply-to-all guidelines
for counties (cities) to compile their budgetary reports. All interviewees from DOF and
DBAS claimed that those directions are enough to sustain the quality of local budgetary
reports. For example:

Currently, we follow thee directions prepared by the central government to
guide us through budget and final account reports compilations. Those
directions are more detailed than the Budget Act and the Final Account Act
in terms of providing a uniform format for budget documents. [Asked: It
seems those directions are revised annually, any inconsistence?) Not at all,
when the national government (Directorate-General of Budget,
Accounting, and statistics of the Executive Yuan) wants to revise
directions, we are invited to the meeting and are able to express our
concerns about the pros and cons of the prior year’s directions and our
suggestions. In general, the Budget Act and Final Account Act provide a
framework for those budgetary documents, and directions are detailed.
The current legal framework is enough to sustain the quality of budget and
final account reports.

—Interviewee No. 3

Current law reserves the right for local governments to compile their own budget
handbooks and final account documentation. Currently, Taipei Municipality, Taipei
County, and Kaohsiung Municipality develop their own handbooks. The three
jurisdictions believe each county (city) has its own features that cannot be captured by a
general regulation or direction, so a specific handbook is necessary to maintain the
accountability of local finances.
Although local practitioners do not consider a concrete budget and final account regulation designed specifically to local government are necessary, applying the laws and regulations of the national government to local governments generates some problems. For example, in the Budget Act, the operating budget and capital budget are distinguished, capital revenue cannot be used to support governmental operating activities, and the operating budget is required to be balanced. On the other hand, under Article 10 of the Budget Act, all intergovernmental transfers are considered part of the operating budget, since they are operating expenditures of the national government. This definition results in an overstatement of operating revenue and an understatement of capital revenue, since categorical grants are attributed to capital projects but are categorized as operating revenue in local budget reports. The overstatement of operating revenue due to misallocating categorical grants to the operating budget does not cause policy debates among local governments. It is considered a “convenient” way to reach the balanced budget requirement.

The gray area of the current Budget Act provides an opportunity for local governments. The problem you mentioned about grants and operating accounts is actually an advantage rather than a problem. Maybe this isn’t correct, but without this misallocation of categorical grants from capital revenue to operating revenue, we will have bigger shortages in our budgets. From our perspective, applying Budget Act to county or city budget compilations does not cause any inconvenience, the real problem for us (local governments) is we do not have money.

—Interviewee No. 11

However, empirically, this mis-categorization actually lowers local financial accountability, since the nominal balance of the operating budget does not mean the real balanced budget. Local jurisdictions may use some capital revenue, for example, the
county (city) bonds and borrows to support their operating expenditures, and those activities are not reflected on the budget and financial statement reports.

**Open Budget Process**

>The budget process and the information presented in the budget documentation are central to fiscal transparency. Almost without exception, the annual budget is the government's main instrument for setting fiscal policy. It is the occasion on which the government presents its expenditure proposals and the means by which it will finance them, within the context of explicit statements of its policy intentions. Alongside the formal set of line-item allocations of spending organized by administrative unit, which forms the core of information needed by the legislature to scrutinize and approve spending, the government uses the budget to detail its proposals for revenue collection and borrowing, placed in a historical framework, and explains how these proposals will help achieve its objectives.


Briefly, Taiwan’s budget formulation process is not open enough: descriptions of major revenue measures are available and clearly stated, but the descriptions of major expenditures are not clear enough. Further, revenue and expenditure contributions to policy objectives and the estimates of their impact on future budgets and economic implications are overlooked.

Laws and regulations related to budget execution indicate that timely mid-year budget execution reports should be submitted to the legislature and audit agencies, and frequent updates of budget implementations should be submitted to responsible agencies for review, but laws and regulations reserve the right for local governments to decide whether to disclose the information or not. In practice, most local jurisdictions choose to publish monthly or quarterly budget implementation summaries on their websites. Some counties also make their monthly accounting reports available, as well, but some counties do not actively provide any periodic budget updates. Those updates are often tables.
and/or figures without explanations and statements about the results of budget implementations. Mid-year budgetary reports are obliged to be published, but the forms of publication are not regulated. Most jurisdictions do not actively provide these data.

The *Budget Act* reserves the right for local governments to propose extra budgets during the fiscal year when necessary. In the legal framework, the completion, review, and implementation of extra budgets should apply all the procedures of the general budgets. In practice, administrative procedures of extra budgets are tightly monitored by the legislature, but the frequent use and scale of extra budgets often complicate locally financial accountability.

Finally, local audited final account reports are presented to the local legislature four months before the start of next fiscal year. Those audited reports are published after the legislature reviews are finished, but the accessibility of those reports is low.

**Budget Formulation and Annual Budget Report**

In Taiwan, budget formulation is a process that excludes residents’ direct participation. There is no public hearing on the budget proposal. The local legislature represents local residents on budget formulation. Although residents are permitted to attend the budget deliberation, the local legislature does not regularly release the deliberation schedule. Local residents learn about the policy target and budget issues through mass media *after* the budget proposal is deliberated in the legislature, and they can read the whole budget reports only *after* the proposal is approved by the legislature.

In budget reports, descriptions of revenue sources are much more detailed than expenditure descriptions. Budget reports are mostly presented in the form of tables rather than in figures or statements. Revenue tables are composed of operating revenue sources,
budget numbers, current year budget amounts, final accounts of the prior year, comparisons between budgeted and current amounts, and explanations of legal bases of revenue and estimates of receipts. Revenue sources are demonstrated first by type, followed by agency, and then by item. Laws and regulations related to each revenue source are articulated in the explanation column. However, there is no description about the forecasting process, and the budget report does not provide information about economic factors used to forecast the revenue. In practice, officials from local DOFs indicated that tax receipts forecasts are computed using software that has pre-built tax revenue formulas. The input economic variables used are released by the Directorate-General of Budget, Accounting, and Statistics of the Executive Yuan (DGBAS), and regional demographic information is surveyed by the local BAS. The forecast of non-tax revenue is based on current year numbers with adjustments for forecasted economic factors and important policy changes. However, these forecasting processes are not released along with the budgetary documents, and most interviewees claimed that it is not necessary to have the information published since “no one is going to care about that.”

Expenditure tables in budget reports are similar to revenue tables. However, expenditure items are integrated into general categories without detailed descriptions of the specific expenditure target. Not all expenditure tables have a statement column, and even there is a column of explanations, it contains only (1) itemized expenditures of each integrated expenditure; (2) summarized changes from current year to the budgeted year; and (3) details of those changes. In general, expenditures are described in a clear and understandable way, but those descriptions place more emphases on comparisons between the current and budgeted year. In other words, the description of expenditures
emphasizes the increments or reductions of the budget rather than the budget number per se, therefore people may find it difficult to understand how the budget numbers are estimated and what they stand for in terms of policy. There is no statement related to the contributions of the expenditure to any policy objective, and there are no estimated impacts on future budgets or economies.

**Extra Budgets**

Chapter five of the *Budget Act* states that there are two forms of extra budgets in Taiwan: the additional budget and the special budget. Local governments are permitted to propose an additional budget during the fiscal year when any expenditure increase is due to the revision of an existing law or the enactment of a new law, or when the expenditure exceeds appropriations due to accidental events. Local governments also may propose a special budget during the fiscal year when there are emergent needs for national defense or significant changes of national economy, serious calamities, and irregularly political events that require extra money.

Articles 82 and 84 of the *Budget Act* stipulate that extra budgets should use all the administrative procedures and restrictions that are applied to the general budgets; the only exception is when the special budget is proposed to respond to emergent national defense needs, national economy changes, and calamities. When one of the above conditions is met, part of the special budget may be appropriated in advance for legislature deliberation, called advanced payments. Any advance payment during the fiscal year should be covered by additional or special budgets in compliance with Article 4 of *Regulations for Handling Advance Payment*. Extra budgets are required to be compiled into the general municipal/county (city) final account reports in accordance with Article
82 of the Budget Act and Article 22 of the Final Account Act. A multiple-year special budget goes through legislature deliberation in the first proposed year, but the revenue and expenditure of each year should be recorded in the corresponding year-end final account report and reviewed by the audit agency and legislature.

Procedures for extra budgets are strictly monitored by the legislature, but the justification has been seriously distorted in recent years. Specifically, counties (cities) tend to abuse extra budgets, especially additional budgets. Additional budgets are justified on the ground that governments have to deal with unexpected needs during the fiscal year due to law changes or unexpected events. However, in the recent years, additional budgets have become common, and the size of the budgets in some jurisdictions has exceeded 20 percent of the general budget. In practice, extra budget proposals are presented to the legislature in the manner consistent with the general budgets, and legislature deliberations seldom focus on their legitimacy.

Having more than one budget proposed in a year would reduce financial accountability, since people may feel confused about the actual scale of the jurisdiction’s budget. Moreover, it might be possible that local jurisdictions reserve some portion of the budget when compiling their annual general budget, while proposing extra budgets to cover the reserved portion during the fiscal year. Reviewing an annual budget proposal is a major task for local legislatures, but interim budget proposal deliberations draw little public attention and are considered less important to the legislative agenda, as the opportunity for getting a full appropriation is higher than the general budget proposal. For local governments, extra budgets have become a convenient way to propose new expenditure needs.
Final Account Audits

According to the legal framework built under Articles 60 and 105 of the Constitution and Article 34 of the Audit Act, the executive department should submit their final account reports to corresponding audit offices within four months after the end of the fiscal year (in December), and audit offices should present the audited final account reports to the corresponding legislatures within three months after receiving the final account reports from the executive departments. Also, Article 34 of the Audit Act indicates that the director of the respective audit office should present in the corresponding legislature and respond to inquiries.

In practice, counties (cities) usually submit their final account reports in February and March to their respective audit offices for financial review. Starting in March, auditors from each decentralized audit office travel to local jurisdictions to conduct site reviews. In July, audited final account reports are sent to the legislature, and the director of each audit office presents in the legislature for inquiry responses in the next regular legislature session. Audited local final account reports of are published after legislature reviews, usually in November or December. The Ministry of Audit (MOA) publishes the integrated municipality/county/city audited financial statement report and makes the publication available on the MOA website. Individual county (city) final account reports are sent to each jurisdiction for their reference, but the MOF only makes audited reports of municipal governments available on the website. Other individual audited reports are in hard copy and are only available in public libraries or upon request. Overall, Audited Final Account Reports are not easily accessible, and audit agencies are conservative
about information disclosure. A more detailed introduction of the audit system is presented in the section “Assurance of Integrity.”

**Discussion: Citizen Participation**

The budget process is more open today than in the past, but citizen participation in the local budget process is uncommon. Citizen participation in Taiwan’s local budgetary events is passive rather than active. Local residents in Taiwan have access to budgetary information only after the budget proposal is submitted for legislative deliberation and when the media reports related news. Even if citizens are aware of budget issues, they do not have formal outlets to express their opinions.

This finding corresponds to Ebdon and Franklin’s (2004) observation on many cities in the United States. Although current literature advocates the public sector to utilize citizen input in budget formulation to increase the responsive accountability of local budgets (Ebdon & Franklin, 2004; King, Feltey, & Susel, 1998), the budget formulation is considered a fully governmental task in Taiwan. Interviewee No. 6 indicated that the process of expenditure estimates is conducted among governmental agencies:

> The whole process is implemented within government agencies. We submit the budget proposal to our legislature to get their approval. [**Asked:** How can your citizens obtain budget information at this stage?] I don’t understand your question. Our citizens know exactly what our mayor is going to do. They can check our websites, and they can read our revenue and expenditure tables from the website, too.

Budget formulation is done exclusively in the public sector in Taiwan. Several barriers for citizen participation in budget process are identified by the literature, including the lack of knowledge, the consciousness that their opinions are unimportant, citizen apathy toward politics, and insufficiency of time (Firsby & Bowman, 1996; King, Feltey, &
Susel, 1998). These are all true in Taiwan. Seniors in Taiwan have been taught to trust the government and not to challenge public authority. Although this situation has changed with the democracy in Taiwan, people do not want to spend time on public affairs (Lee, Huang, & Tu, 2007). Specifically, people criticize the results of public policies, but they are reluctant to participate in policy formulation. This is primarily due to Taiwan’s political culture. Miller and Evers (2002) argued that citizens are apathetic if the political culture tends to discourage citizen participation. Unlike most states in the United States which impose legal requirements on public participation on local budgets (Ebdon & Frankline, 2006), there is no participatory mechanism on the budget decision-making in Taiwan. So, it is not surprising that people in Taiwan do not have the necessary knowledge and are not interested in local budget making. 78 Therefore, the degree of an open budget process in local governments in Taiwan is not sufficient.

Public Availability of Information

Making fiscal information available to the public is a defining characteristic of fiscal transparency. 80 principles and practices in this regard concern the provision of comprehensive information on fiscal activity and government objectives and the presentation of such information in a way that facilitates policy analysis and promotes accountability.


Local budget documents cover all budgetary and extra budgetary activities of the government within the fiscal year. Information on the past is specified in all budgetary documents. In some jurisdictions, a simplified statement of existing or newly raised mid- and long-term fiscal projects is only provided in annual budget reports. On the contrary, a

78 However, a granted project conducted by Lee, Huang, & Tu (2007) indicated that through various participatory mechanisms, such as citizen conference and deliberative surveys, citizens’ interests on county level projects are increased.
A separate chapter for debt statement is presented in the final account report only. Periodic reports on debt financing are updated on local BAS or DOF websites in some jurisdictions; the frequency of updates varies from month to year. Article 7 of the Freedom of Government Information Act stipulates that publishing budget and final account reports is considered an obligation of all levels of government. This stipulation is completely implemented, although not all local governments provide the full content of their publications on their websites. All municipalities and counties (cities) publish periodic reports of budget implementations at least on a quarterly basis, and most jurisdictions provide monthly statements, although some merely provide summarized tables for budget outturns. An advanced data release calendar for statistical updates is a legal obligation for governments, but whether or not statistical data include fiscal data is not specified in the law. In practice, 16 out of 23 jurisdictions release advanced calendars that include fiscal data updates.

**Coverage of Budgetary Documents**

Budgetary documents provide comprehensive coverage of financial activities of the general government, including both operating and capital accounts. Subsidiary agencies’ budget and final account reports provide information about the financial conditions and plans of local subsidiary agencies. Extra budgets are compiled into the final account reports at year-end. Disaggregated revenue and expenditure data for the general account and special accounts are included in budgetary documents, and summarized tables for consolidated data are also provided. Detailed and aggregated revenue and expenditure data are compared to the outturns for previous years — the budgeted number for the
current year and the final account number for the previous year. Some jurisdictions also provide a comparative table of revenue and expenditure for the last five years.

Prospective fiscal activities are not described in budgetary documents, except for the mid-run and long run capital budgets. A mid- and long-term budget plan was implemented in Taiwan in 2002, mid- and long-term fiscal projects are specified in the annual general budgets as a separate chapter, such as continuing capital plan. The mid- and long-term projects are listed as yearly plans, including the allocation of revenue and expenditures for each year (up to four years). There are no prospective fiscal plans for the general budget. As previously stated, the budget reports describe revenues and expenditures as numbers that need more explanation instead of numbers that need further analysis. The information for future policy targets is not explicit enough.

**Statement of Government Contingent Liabilities**

Governmental fiscal activities should not be considered merely reported revenues and expenditures, rather, there have been more and more countries facing the problem of increasing contingent liabilities (Brixi & Schick, 2002). This happens when the government adopts unbudgeted resources or debt to pay for obligations, and only a few people know the off-budget obligations are accumulated. Brixi (2006) argues that the conventional mechanism on governmental financial accountability devotes weaker scrutiny to non-cash fiscal support and longer term projects, and that provides the opportunity for off-budget activities. Kharas and Deepak (2001) indicate that the use of debt issuance to support current government activities creates “hidden deficits” (p. 32), which have been found to be larger than conventional budget deficits in some countries,
especially in developing and transitional countries. Kharas and Deepak point out that understanding governmental contingent liability is as important as understanding the conventional budget deficits, because conventional budget deficits do not take into account the “future” figures of fiscal situations.

Brixi (2006) argues that the accountability problems associated with contingent liabilities are mainly due to inadequate limitations, procedures, approval processes, and reporting requirements of institutions. In Taiwan, the *Public Debt Act* stipulates that municipality/county (city) can use debt financing when available resources are not able to meet expenditure needs, but restrictions are imposed, as well. Local governments can issue debt when the forecasted revenue cannot cover estimated expenditures, but the new debt shall not exceed 15% of the total expenditures included in the general and extra budgets. Debt financing is adopted to maintain the budget balance in general funds, and proposals of debt issuance are subject to the legislative deliberation. In practice, many jurisdictions issue debt to support general expenditures, and some of them have been at the 15% cap for many years. Interviewees argued that the 15% cap restriction is not reasonable since their obligations have long exceeded their available sources. Some interviewees even claim that the debt cap restriction is evidence of fiscal control from the national government.

In local budget reports, debt related information is scattered in different tables based on their characteristics. Interest expenses on outstanding debts (named *debt expenditures*) are listed as the general current expenditure in the general budget reports. Newly issued debts are listed as receipts, and debt repayments are listed as payments in the table of

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79 According to their survey on 32 countries from 1980-1997, contingent liabilities in developing and transition countries have contributed to 2% of their GDP.
consolidated receipts and payments comparisons. General budget reports only have budgeted year debt information, while a statement of long-term local public debts is included in the final account reports as a separate chapter. In the debt statement in final account reports, newly issued debts, accumulated outstanding debts, debts payable and repayable are explicitly presented as appendix information. A statement of finance-based scheduling in final account reports also describes financing tools adopted during the past year, and these tools include debt financing and the use of surplus prior year funds.

In addition to budgetary documents, eight out of 23 jurisdictions also provide detailed information about their public debt on their DBAS or DOF websites, including newly issued debts (one-year and longer term), accumulated debt obligations, payments of debt principles and interests, and a statement of financing activities related to the debt. The eight jurisdictions update extra information about their public debts on the website on an annual basis. Three jurisdictions of out of the eight also update debt information on a monthly basis, but only Taipei Municipality provides detailed monthly public debt statements.80

Overall, final account reports address more information on the financial conditions of local jurisdictions, since budget reports provide only current year debt information. Borrowing is an indicator of the financial health of a jurisdiction, and budget reports should provide detailed information on financial conditions for residents to review. Laws and regulations related to public debts do not specify the degree and approach of debt information disclosure; in practice, this information becomes available to the public after the fiscal year ends. Since the general budget report is the main budgetary document to

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80 The other two jurisdictions, which update their debt expenses and accumulated debt outstanding in their monthly accounting reports, are Kaohsiung County and Hualian County.
state the policy targets for next year, the financial condition of the county (city) from a longer-term view should be addressed.

**Timely Publication of Fiscal Information**

Article 7 of the *Freedom of Government Information Act* stipulates that publishing budget and final account reports should be an obligation of all levels of government. This stipulation is completely implemented. All level governments have published their annual budget reports, extra budget reports, and final account reports as hard copy publications. Municipal, county, and city governments have also made their general budgets, additional budgets, and final account reports (audited or non-audited) available on their websites. Special budget reports are published as hard copy and are available in public libraries or upon request. Not all counties (cities) upload the full contents of their budget/final account reports, but at least the summarized consolidated tables, detailed revenue and expenditure tables, and comparison tables are provided.

Article 7 of the *Freedom of Government Information Act* also indicates that the government policy plan should be published by governments. In practice, local governments publish their policy targets in the form of a news announcement, and the announcements are also available on government websites. This information is updated frequently, and some jurisdictions also indicate the relationship between the policy targets and projected budgets. The law does not specify that timely information about the implementation of targeted policies is a government’s obligation, but all municipalities and counties (cities) publish periodic budget implementations reports at least on a

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81 Only Taichung County, Taipei Municipality, and Kaohsiung Municipality make the full text of their budget reports available on their websites and only Taipei Municipality provides the full text of their final account reports (audited and pre-audited) on their website.
quarterly basis, and, most jurisdictions provide monthly statements. Chia-Yi, Kaohsiung, and Hualian counties also provide monthly accounting reports about their revenue and expenditures. Twelve jurisdictions update monthly or quarterly tax revenue collection tables. Although producing mid-year budget execution reports for the legislature is a government obligation, regulations and laws do not indicate this information needs to be released to the public. Two of the 23 jurisdictions provide mid-year budget implementation information on their websites, but not all of the governments make this information available.

An advanced data release calendar is a legal obligation for governments. Article 6 of the *Statistical Data Dissemination Directions of Government Agencies* stipulates that governments should publish the schedule of statistical data releases at least twice a year. It is not explicit about whether timely fiscal information is included in statistical data — some counties (cities) categorize expenditure and revenue updates as statistical data, some counties (cities) include the updates in their accounting reports, and still some counties (cities) include the updates of budget execution in the list of updates of final accounts. In practice, the calendar of statistical data release is announced on the government websites in all 23 jurisdictions, but seven of them do not announce the schedule for fiscal data releases.

**Discussion: The Freedom of Public Fiscal Information**

The concept that people have the right to access governmental information has been confirmed by international standards. Existing literature has argued that the degree of freedom of governmental information is associated with better financial accountability.

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82 Article 19 of the *Universal Declaration of Human Rights*, UN General Assembly Resolution 217A (III), 10 December 1948, has declared that people have the right to freedom of expression and information.
For example, Diamond (2008) indicated that “in the fight against corruption, the public availability of information on government finance, procurement, and contracting is particularly important… such information would ideally be posted on the Internet” (p. 304). Although many countries have promulgated acts related to the freedom of information, some countries have been conservative about sharing information with their citizens (Ali, 2003).83 Taiwan’s Freedom of Government Information Act (FGIA) was enacted in 2005, but overall governmental information freedom in the status quo in Taiwan is not transparent enough.

In general, formal commitments for more regular publications of local fiscal data have not been made, and the requirement of a schedule for a fiscal data release is not stipulated in any regulation. However, in practice, local governments are proactive about fiscal information disclosure, although with significant differences on the practices of e-government policy. In the context of public availability of information, the practical side is more advanced than the legal side, but the degree of financial transparency is still not sufficient. Some local jurisdictions have the traditional perception that the public does not need to know and is not interested in local fiscal conditions.

We update periodic budget information on the DOF and DBAS websites, but those are statistical data rather than accounting reports. The statistical data are composed of receipts and payments recorded by the County Treasury. We do not make the accounting reports publicly accessible because those reports may not correctly reflect our financial conditions and people may not have enough knowledge to understand what the reports mean.

—Interviewee No. 9

We have done what the Freedom of Government Information Act requires us to do, and this is enough. Our administration (note: internal auditing

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83 Ali (2003) indicates that in some south Asian countries, such as India, Pakistan and Bangladesh, there used to be laws and acts that imposed controls on information sharing of the public sector.
administration) is irrelevant to the citizen’s rights, so people may not be interested in knowing this information. Only scholars want to understand some details because of their research. Fiscal transparency is a governmental responsibility, and I think we have open enough information on our websites.

—Interviewee No. 13

Some local jurisdictions have perceived that budgetary transparency in Taiwan is not enough to secure local financial accountability. Interviewees No. 10 and No.11 indicated:

Fiscal transparency in Taiwan is not sufficient. Even though there is a lot of information available on the governmental websites, more data are hidden. Not only in local governments, even the central government hides more than it has released. The information that is made publicly available is in general term or consolidated category. For example, any report about the expenditures on water conservancy will not tell you which river. People can only have the information on “10 billion on water conservancy,” but no one knows why this expenditure is relevant to their life. Under restricted internal controls, our revenue is pretty transparent because you have to provide a detailed procedure about how we get money from our citizens, including the debt information. As for expenditures, we (DOF) don’t even know how other agencies spend their money.

The information provided is not enough for citizens to monitor the government’s activities. Specifically, although Interviewees No. 10 and No. 11 pointed out that the revenue information is transparent, non-tax revenue is reported in the form of “other total” rather than itemized. Additionally, expenditure information is as important as revenue information, and financial accountability can be sustained only when both revenue and expenditure information is transparent enough to enable monitoring from the outside. From this perspective, local finance in Taiwan does not meet international standards of financial accountability.

Assurances of Integrity

It is essential for fiscal transparency that fiscal data reported to the government meet basic criteria that attest to their quality, and that mechanisms be in place that provide assurances to the legislature and the public about data integrity. Internal
oversight mechanisms are necessary for the conduct of public officials, public service employment, internal audit, procurement, purchases and sales of public assets, and national revenue administration. External oversight mechanisms also provide assurances through an independent national audit body, a national statistical body, and engagement with external independent experts.


The legal framework intends to develop reliable revenue forecasts and expenditure estimates, while in practice expenditure estimates are not reliable enough. The national government has been attempting to enforce governmental accounting for all levels of government in recent years. The Taiwanese GASB, called GASRB, the Governmental Accounting Standards Reviewing Board, has been organized, and the Taiwanese GAAP has been issued. However, budgetary documents do not specify the accounting basis used in compilation, and interviewees seem to ignore the importance of consistent accounting.

An internal audit is conducted by accounting staff within each individual agency. A uniform regulation related to the internal audit is applied to all levels of government, and some local jurisdictions also create their own internal audit principles. The internal audit is mainly focused on financial auditing — the comparisons between the planned allocation of the budget and actual budget implementation. Local governments emphasize overspending while sometimes ignoring the problem of under spending. The local DBAS is responsible for final account report examinations but merely focuses on material misstatements.

External auditing is conducted by an independent audit office, which is ensured its independence and integrity by the Constitution. Taiwan’s audit system is directly responsible to the Control Yuan, and audited reports of each level of government are presented to the respective local legislatures. An external audit occurs at the early stage of budget implementation. Although the legal framework distinguishes internal from
external audits, in practice, the external audit influences the quality of the internal audit. The implementation of auditing authority is mostly focused on voucher examination rather than performance auditing. All interviewees from audit offices claimed that the current audit administration needs to be improved and should have more emphasis on performance examinations.

Quality of Budget Data: Revenue Forecasts and Expenditure Estimates

Taiwan’s laws and regulations aim to develop reliable revenue forecasts and expenditure estimates for central and local budgets. *Directions for the County (City) General Budget Compilation and Principles for Preparing Central and Local Government Budget* indicate that revenue forecasts should be derived from figures for final collections of the prior year and actual collections of the current year, and checked against significant policy and legal changes, macroeconomic data announced by the Directorate-General of BAS (DGBAS), and residents’ income data as submitted by corresponding BAS offices. Expenditure estimates should not be estimated on an incremental basis. Article 13 of the *Directions* states that expenditure estimates should be made upon the applicability of policy targets rather than previous budget information.

In practice, revenue forecasts generally follow the legal requirement. Each local agency (the revenue collector) forecasts their revenue receipts based on the prior year’s actual collections and the executed portion of the current year. DOF adjusts the total forecasted revenue with policy and law changes and economic factors. Economic variables are provided by the central and local BAS agencies. Receipts from intergovernmental transfers, including grants and CATR funds, are announced in advance by the granted central agencies. The sale of public properties are also estimated based on
the prior year’s collections and checked against predicted economic factors of the budgeted year.

However, the implementation of expenditure estimates is not as reliable as revenue forecasts. Although related regulations and acts stipulate that expenditures should not be estimated based merely on prior year information, local DBAS indicates that the expenditure estimates are actually not implemented as a zero budget. Officials from local DBAS’ confirm that the mayor set spending caps based on the current year’s initial budgets and the prior year’s final accounts for each agency, and the rule of thumb is “zero increment” in local jurisdictions where financial conditions are bad. The implementation of expenditure estimates is against current regulations and acts, and the estimates, if deemed to be equal to previous year’s estimates, are not reliable. In addition, the heavily reliance or even the abuse of additional budgets in counties (cities) have undermined the expenditure estimates of initial budgets, since estimated results derived from initial budget numbers of the current year may not reflect the total expenditure needs.

Finally, although there are some issues with expenditure estimates, local budget reports and final account reports have some positives regarding quality revenue and expenditure information. For example, those reports provide comparisons of the proposed receipts and outlays with current year budget and prior year final account amounts. Comparisons are not made only for aggregated budget data but also for detailed revenue and expenditures, and those comparisons are believed to improve the reliability of budget data.
Quality of Budget Data: Accounting Information

In the recent years, the Taiwan government has considered enhancing financial and accounting information an important part of reinventing government. Through 10 years’ research, the DGBAS organized a Governmental Accounting Standards Reviewing Board (GASRB) in 2002, which provides standards and guidance for governmental accounting and financial reporting. Article 19 of the Amendment of Accounting Act regulates that except for the Accounting Act, governmental accounting should follow the GASRB. The primary mission of Taiwan’s GASRB is to create a comprehensive set of standards and develop a new reporting model for the government accounting profession. Currently, the GASRB has issued three volumes of Concepts Statements of Government Accounting Standards (CGAS) and 10 volumes of Generally Accepted Accounting Principles (GAAP). The CGAS indicates the scope and the goals of governmental accounting. The GAAP was developed to guide users through governmental financial reports, and thus to enhance financial accountability of the public sector. According to the CGAS, the definition of users of financial reports is anyone who wants to understand governmental financial information. This is contradictory to the traditional perception that only professional accountants, auditors, and legislators (or members of local councils) have to understand how to read governmental financial reports. In the framework built by the GASRB and the Accounting Act, both central and local governments shall respond to the GAAP and compile their financial reports following these principles.

According to the Taiwanese GAAP, there are four type of accounting bases generally used to compile accounting reports, i.e., accrual basis, cash basis, modified accrual basis, and modified cash basis. GAAP Volume 1 indicates that agencies should prepare their
accounting or fiscal reports using these four accounting bases, contingent on the focus and the traits of the reports. However, indicating the adopted accounting basis in published fiscal information is not currently a legal government obligation in Taiwan. In practice, most interviewees from each local DGBS claimed that GAAP merely reflects those *consensuses* that have been done for a long time, but through the interviews it was found that managerial level officials do not know the contents of GAAPs. Further, the traditional perspective that governmental reports are *not* deemed necessary for the public still exists in local level governments, but some improvements on this traditional concept have also been found. Interviewee No. 9 claimed:

> It never occurred to me that our citizens would want to know about accounting information until you asked this question. If you are interested, maybe you can consult with our IT staff about the frequency of data downloaded by people; my guess is that it would be very low. I agree with you that we should address bases of accounting in those budgetary reports, though, to monitor if governments compile those reports compliantly with general principles such as GAAP. Although I still doubt our citizens are going to be more interested in understanding this information, I admit that we (the public sector) have to prepare the information for future reference.

In conclusion, Article 19 of the *Amendment Accounting Act* is not enacted strictly. However, since accounting is not merely a tool of measure but also a tool of communication, enhancing GAAPs on governmental budgetary documents is an important mission in Taiwan, in the central government and in the local governments.

**Internal Oversight of Fiscal Activities**

Internal auditing is conducted by the accounting staff of each agency and is monitored by the local DBAS in accordance with the *International Auditing Principles*. The *Principles* clearly define the three objectives of a governmental internal audit — financial auditing, property auditing, and working auditing. Financial auditing refers to
investigations on budget implementations and budget controls, including budget proposal examinations, revenue and expenditures controls, and accounting.

The budget proposal examination refers to examinations on legitimacy, importance, and feasibility of budget proposals in the budget formulation stage. The local DBAS is responsible for it. For the legitimacy examination, the proposed projects are carefully scrutinized for their compliance with laws and regulations, and social perspectives sometimes are taken into consideration. For the importance and feasibility examination, agencies are asked to rank their projects by priority. DBAS then seeks available resources and examines if the projects are worthwhile and affordable.

Controls of budget executions are done by the accounting staff of each agency based on the assigned allocations of monthly revenue and expenditures. Some jurisdictions have their own internal audit guidelines, but most simply follow the national regulation. Controls of budget implementations, which aim to investigate the efficacy of budget operations, are in the form of daily and monthly accounting reports. Daily accounting reports reflect daily receipts and outlays by collecting original vouchers for every spending activity. Monthly accounting reports not only accumulate the above daily reports, but also examine the efficiency of budget executions by comparing the monthly total to the monthly-allocated budgets. Although both overspending and under spending are considered inefficient, in practice, some local governments tend to control overspending only:

In our financial situation, we would never force the agency to spend the money they should have spent, even if there are non-executed budgets. In practice, we think having surplus is more important than perfect budget execution. Even though the unexecuted portion of budgets will be cut from next year’s budget proposal, we do not think it is a bad thing — to slow down the growth of our budget.
When we leave some budgets (not executed), the audit office will say our budget execution degree is too low. However, audit offices also know that some budgets are difficult to execute, for example, the legislature might be concerned about public opinion and ask us not to implement some projects. From our (DBAS) perspective, we would consider if the non-executed budget is due to special situations and if it is important. If it is important, we (DBAS) will still put it in our next year’s budget, and try to convince the legislature. But overall, we do not exactly perform oversights on under spending.

—Interviewee No. 5

What Interviewee No. 5 indicated is true in some local jurisdictions, but this is not true for all. For example, Interviewee No. 1 pointed out that it is not possible to ignore the non-executed budgets since they also imply inefficiency in financial management. Therefore, one might be able to conclude that financial condition is associated with the quality of internal auditing, since Interviewee No. 1 represented officials from a richer jurisdiction.

When compiling final account reports, the local DBAS uses the information derived from the monthly accounting reports of each agency and examines the efficiency of budget implementation of the whole general government. The examination on final accounts conducted by the DBAS focuses on the relevance, accuracy, and completeness of financial statements. First, the local DBAS is responsible for checking material misstatements. For example, DBAS notes that revenues and expenditures should not be mis-categorized, numbers reflected on the reports should be accurate, and explanations for differences between budget numbers and final account numbers should be clear, reasonable, and understandable. The DBAS examination of final account reports also emphasizes the efficiency of budget implementation. However, Interviewee No. 5
indicated that the only criterion the DBAS looks at is the degree of the completion of the budget execution:

It is technically impossible for DBAS to check for all spending activities of all agencies in the year, because we do not have time to trace back to every original voucher and ask the agency why the amount is so low/high. The data sent to us from each agency are categorized rather than itemized. Even if agencies can give us itemized statements, we will not read them in detail. It just takes too much time.

Although most interviewees argue that the internal control of fiscal activities in the local level is improving, internal auditing of local governments in Taiwan is in general not well developed. First, internal financial auditing should focus on whether or not spending is within budgeted caps and on designated items (Glaser, 2007), while some local jurisdictions claim that their internal auditing is mainly concerned with the former. Also, the local DBAS is more concerned about the completion of budget rather than where the money has been spent. Second, Glaser (2007) argued that good internal auditing shall be conducted by independent agencies within local governments. However, the internal audit function of local governments in Taiwan is conducted by the accounting staff within each agency, although monitoring is implemented by an independent DBAS. Those who are responsible for agency internal audits are neither auditors nor are they supervised by the independent DBAS. Therefore, it is not certain that the internal audit function of local governments in Taiwan is not influenced by executive agencies.

**External Auditing: Legal Framework**

An external audit is independent from the executive branches at all levels of government, and its independence is assured by the Constitution and other laws or acts. Article 3 of the Auditing Act (or Law of Auditing) stipulates that governmental audit
duties and functions should be conducted by audit agencies. Article 90 of the Constitution indicates that audit power is considered one of three major functions of the Control Yuan. Article 104 of the Constitution stipulates that the Auditor-General is directly subject to the Control Yuan, and mandated by the President and approved by the Legislative Yuan with a six-year tenure period. The Auditor-General chairs the Ministry of Audit, which is in charge of the national auditing administration. Article 5 and Article 7 of the Auditing Act indicate that each jurisdiction should have either an independent audit office or an assigned nearby audit office supervise the implementation of budgets. Municipal, county, and city audit offices are subordinate to the Ministry of Audit. A simplified chart presenting the audit system is shown in Figure 13.

Article 2 of the Auditing Act enumerates the major duties of financial auditing as (1) to supervise the implementation of the budget; (2) to certify receipt and payment orders; (3) to examine financial activities and certify annual financial reports; (4) to inspect irregularities and dereliction of duties concerning the financial activities; (5) to evaluate the performance of financial activities; (6) to judge financial responsibilities; and (7) to perform other audit works stipulated by other laws. In other words, the legal responsibilities of audit agencies are to examine the effectiveness and efficiency of governmental operations; to enhance the reliability of governmental financial documents; and to ensure governmental financial activities comply with laws and regulations.

External audits start with the examination of local line-item allocations of budgets. After the approval of budget bills, agencies break down the budget to monthly allocations, and the allocated budgets are sent to the audit office for an efficiency and legitimacy

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84 Twenty-two studied jurisdictions have independent audit offices; only Penghu County’s audit administration is governed by Tainan City’s audit office.
review. The most important output of the audit office’s supervision on financial activities is the *Audited Final Account Report*. Article 105 of the *Constitution* and Article 33 of the *Auditing Act* explicitly state that audit offices should complete the auditing of the general government’s final account reports within three months after receiving the final account reports submitted by the local DBAS, usually in March or April.  

*Audited Final Account Reports* should be submitted for legislature deliberation. The head of the local audit office should present to the legislature and provide requested information. Approved local audited final account reports are submitted to the Ministry of Audit and the Control Yuan and published by the Ministry of Audit. The more detailed process of local final account report auditing is presented in Figure 14.

The functions of auditing a government’s final account report are listed in Article 68 of the *Auditing Act*, including examining and explaining the degree of budget

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85 According to Articles 60 and 105, the executive chair should submit the final account reports to the audit party within four months after the end of the fiscal year. In practice, most local governments submit final account reports earlier, usually in March.
implementation; investigating the difference between total revenue and total expenditures, and explaining any differences; noting if final revenue and expenditures accounts correspond to the economic situation and expected policy targets; and providing recommendations for improvements to executive departments.

There are some gray areas between internal and external audits. Article 95 of the *Accounting Act* indicates that an internal audit is conducted by the accounting staff of each separate agency, and auditors from local audit offices shall not participate in an executive agency’s internal audit. Article 41 of the *Auditing Act* specifies that the degree and scope of the external audit are contingent on the performance of an agency’s internal audit. Therefore, audit agencies are actually involved in controlling the quality of the executive agency’s internal audit function by providing improvement recommendations and enhancing the degree of external auditing.
External Auditing: In Practice

There are four types of auditing activities conducted by the audit agencies: on-site auditing, documentary auditing, ad hoc auditing, and entrusted auditing. The most commonly used auditing approach is documentary auditing, which requires the executive agencies to submit their budgets and financial reports or vouchers to audit agencies to do efficiency, appropriateness, and accuracy investigations. On-site auditing is also conducted regularly to capture detailed information about governmental financial activities. Ad hoc auditing and entrusted auditing are used less frequently in local governments in Taiwan.

Related regulations indicate that audit agencies should perform financial auditing, performance auditing, and special project auditing. In practice, the current focus of governmental audit is primarily the financial audit. Compared to the DBAS, which conducts a pre-audit on expenditure activities regarding the availability of corresponding resources, the audit system provides audits on the legitimacy and appropriateness (effectiveness and efficiency) of fiscal activities and the accuracy of fiscal documents. When there are differences between audited accounts and accounts provided by executive agencies, auditors inform the DBAS, and the DBAS informs the agency. Executive agencies are allowed to appeal rectification mandate raised by the audit office. In the legal framework, the audit office makes the final decision on audited final accounts, and in practice they are open to compromise.

If there is a gray area of the legal framework but the audit office thinks something needs to be rectified, we will have to explain the efficacy of the expenditure. Since there is not an explicit regulation, it is often interpreted differently. Since the final audit is time sensitive, we have to reach a consensus. In some circumstances, the audit office knows that money is unable to be credited, so even if they do not agree with us, sometimes they
will compromise. In return, we will not appeal if their corrections relate to only small amount of money.

—Interviewee No. 4

In addition, as stated in the previous section, the degree and scope of external oversight depends on the quality of the executive agency’s internal audit. Accounting staff in agencies conduct accounting reports and collect original vouchers as supplemental information for internal control for corruption and resources misuse. This information is submitted to the local audit offices for review in accordance with Article 36 of the Auditing Act. The purpose of Article 36 of Auditing Act is to enhance both internal and external auditing by carefully examining governmental disbursements. However, all of the eight interviewees from local audit offices noted that voucher auditing increased their workloads and became an obstacle to a more comprehensive and performance-oriented audit. In the United States, voucher examination was shifted to executive agencies in the early 1950s due to the expectation for a comprehensive GAO audit. Interviewees from local audit offices indicated that their time has been wasted checking vouchers all day. Interviewee No. 14 noted:

It takes a lot of time and labor to examine original vouchers. We do not have corresponding bookkeeping and related information to compare with those vouchers, which make our voucher examination ineffective and inefficient. The time and resources becomes an obstacle to promote performance audit. The principles of a governmental audit in most countries are to avoid voucher examinations, to focus on policy assessments, to develop comprehensive performance audit, to be able to respond to legislature’s requests, and to build up its professional status. Examining original vouchers does not contribute any added value to governmental accountability; on the contrary, we have no time to evaluate special projects. This can be a major gap of a governmental audit between Taiwan and other developed countries.

Finally, the implementation of the audit function is insured its independence by the Constitution and other laws. Most of the time, the audit system conducts audits without
executive branches’ intervention, but some interviewees from audit office expressed concern about the relationship between the audit system and the legislative system. The audited final account reports are submitted to the legislature for deliberation, and the head of the audit office has to present to the legislature and provide information upon request. This process, although deemed to enhance the transparency of governmental financial activities, makes some auditors feel that they are subordinate to the legislative system. However, to enhance the checks and balances mechanism, this arrangement is necessary in a democratic country.

Conclusion

Current literature has considered financial accountability a major danger of fiscal decentralization in institutional centralized countries (Litvack, Ahmad, & Bird, 1998; Prud'homme, 1995; J. Rodden, 2002). This chapter aims to examine local financial accountability in Taiwan — a typically unitary country, using the framework of good fiscal accountability developed by IMF to identify objects and contents of local fiscal accountability. With respect to accountability linkages suggested by Schaeffer (2005), in Taiwan’s local governments, the bottom-up financial accountability is improving but still insufficient, the horizontal financial accountability is well-shaped but the internal audit function is not well-developed, and the vertical financial accountability shows a financial dominance by the central government.

Bottom-up financial accountability refers to the openness of the budget process and the freedom of governmental information. The public information availability in local governments in Taiwan has improved significantly in the recent decade, but the degree of transparency is still insufficient when compared to international standards. Local
governments establish their own websites and provide a lot of information about budget data and statistics. People can find summarized information about local finances, and the information is frequently updated — either by month or by quarter. However, the degree of information available varies among the jurisdictions, and the quantity and quality of information disclosure are not necessarily correlated with the fiscal conditions of jurisdictions. Even though the bottom-up accountability is progressing, some aspects need to be addressed further.

First, the lack of citizen participation on budget formulation could generate problems associated with responsive accountability — public policies do not correspond to people’s needs. Previous literature has argued that the most effective citizen participation should occur in the early stages of policy making and should encourage two-way deliberative communication rather than one-way information sharing (Kathlene & Martin, 1991; King, Feltey, & Susel, 1998). Citizen participation on local budgets in Taiwan, however, occurs in the policy evaluation and is in the form of one-way information sharing. The insufficient open budget process can be attributed to the lack of a participatory mechanism. The establishment of a participatory mechanism on the local budget process should be considered as a contemporary policy target in Taiwan. Moreover, the one-way information sharing is inadequate. Diamond (2008) has argued that citizens should have a legal right to request and receive information about governmental operations that are not relevant to national security or violate an individual’s right to privacy. The field study of Taiwan found that people are passive in receiving public information: although people are able to apply for access to official data, the final decision on whether or not to release the requested information fully depends on
the local government. A formal commitment of governmental information disclosure should be promoted. The quality of information sharing should also be improved, as well. Complete information on contingent liability should be provided in all budgetary documents and should be updated more frequently. Accounting policies should be specified in all fiscal documents rather using a consensus among governmental agencies. The establishment of Taiwan’s GASRB and issuances of Taiwan’s GAAP should be encouraged, and the regulations should make the compliance of GAAP a governmental obligation at all levels of government. Also, updates of accounting reports should contain instructions about how to read the reports, so people who are not public finance professionals can follow the accounting statements.

Horizontal financial accountability, which refers to the clarity of responsibility among institutions and effective internal and external audits, is generally held. Nevertheless, the quality of internal audits needs improvements, and the external audit function needs to be more focused on performance auditing. The checks-and-balances mechanism among executive, legislative, and audit branches is well functioning. The budget process, from formulation to evaluation, is composed of interactions among the executive agencies, the local legislatures, and the local audit offices. These three branches take their own responsibilities independently, and the oversight mechanism is imposed tightly to ensure that fiscal accountability is held. Executive agencies are responsible for budget formulation, and local legislatures scrutinize the efficiency of budget proposals. Executive agencies conduct their internal audits on the implementation of allocated budgets, while external inspections are conducted by individual local audit offices. The audit system is independent from the executive and legislative systems. Final account
reports are audited by the audit office and presented to the local legislature for deliberation. Within the executive branch, DBAS and DOF deal with expenditures and revenues, respectively. Although in some jurisdictions DOF is also involved in expenditure controls, this is not common.

There are some issues associated with internal and external audits. The internal audit function in local governments in Taiwan is mainly implemented by the accounting staff within each agency, and those staff are not directly subject to the DBAS. In other words, those who primarily conduct internal audits are not separate from the executive agencies. The internal audit is therefore not independent and neutral. The supervising agency of the local internal audit, the DBAS, is independent from other executive agencies, but it only monitors the degree of budget execution, and in some jurisdictions, under execution of the budget is not penalized. The internal audit is merely procedural in local governments in Taiwan. The external audit function is independent, but the redundant duty of voucher examinations makes performance auditing difficult. A performance audit emphasizes the quality of the management of public resources. Dye (2007) argued, “they assess the economy, efficiency, and effectiveness of the management of public sector entities by examining resource use, information systems, delivery of outputs, and outcomes, including performance indicators, monitoring systems, and legal and ethical compliance” (p. 316). A performance audit can be a more comprehensive and useful way to monitor governmental financial activities and secure local financial accountability. The policy recommendation is that the external audit in local governments (or even the central government) in Taiwan should be more focused on a comprehensive and performance-
oriented audit and shift the task of voucher examination to agencies that are responsible for internal audits.

Vertical financial accountability, the clarity of roles and responsibilities between the central and local governments, is assured but shows a tendency toward financial dominance of the central government. From a legal perspective, the central government sets regulations and supervision guidelines that ensure a uniform standard is applied to all local jurisdictions to hold them accountable for fiscal outturns. Schaeffer (2005) indicated in his essay that local governments shall have the responsibility to report the use of intergovernmental transfers to the grantee, the central government. However, in the context of Taiwan, the central government not only is involved in the supervision of the use of transfer resources, but also in the decision on how to use the money. This finding corresponds to what Khemani (2007) predicted about the fiscal decentralization in non-federations, a dependency on the central government. A basic criteria of evaluations on fiscal accountability is to examine whether or not the budget corresponds to regional preferences (R. T. Meyers, 1996). The predominance of the central government in the arrangement of intergovernmental transfers, which compose a significant part of local revenue in most local jurisdictions, may hurt local financial accountability.
Chapter Seven: Implications and Limitations

Findings

This dissertation is composed of three independent but linked research studies related to important issues of fiscal decentralization in Taiwan, including an examination of the equalization function of the revenue-sharing program, the CATR, in Taiwan; the detection of the expenditure impacts of this program; and an evaluation of the current accountability mechanism of Taiwan’s local financial system. They are linked in that they provide a more comprehensive evaluation on the quality of fiscal decentralization in Taiwan’s second level governments, municipality and county (city) governments.

Chapter Four and Chapter Five focus on the influences of the CATR program. In particular, they explore the different impacts caused by the transformation of CATR from a discretionary to a formula-driven program in year 2000. Chapter Six evaluates the quality of the financial accountability of Taiwan’s second-level governments based on the international standards of governmental fiscal accountability. Major findings are presented below.

Chapter Four: The Equalization Function of the CATR Program

The first research question of this dissertation addresses the issue related to the effectiveness of the equalization function of Taiwan’s allotted-tax revenue program. Specifically, it examines whether or not a formula-driven fund distribution system enhances inter-jurisdictional fiscal equalization compared to a discretionary fund distribution. The theoretical argument is based on the concept that discretionary transfers create incentives for local governments to negotiate for more transfers, since it is more
likely to involve incentives in non-transparent fund distribution. See Grossman (1994) for detailed arguments. In contrast, a formula-based transfer program encourages transparency and predictability, which eliminate political negotiations in the fund distribution process (Louis, Jabine, & Gerstein, 2003).

A review of the distribution regulations found that the current CATR program is not a purely formula-determined program. The distribution is first by fixed and pre-determined ratios to municipality, county (city), and township governments. Those ratios reflect the compensation of the lost sales tax revenue as a result of the implementation of the new tax structure and the new CATR program. It relates less to interregional equalization. Further, six percent of the CATR funds are reserved as a discretionary fund of the national government. And special CATR funds could be another source of non-transparency.

The second finding of Chapter Four is that the current formula does not significantly improve inter-jurisdictional equalization. Financial gaps between municipal and county (city) governments become smaller, but neither municipalities nor counties (cities) are better off. With regard to the county (city) distribution formula, the findings lent no support to the argument that a formula-driven revenue sharing program is superior to the discretionary program.

Findings for the third empirical question point out the basic problems of the current CATR program — it does not include [enough] poverty indicators in the distribution formula. Only two of the six selected poverty indicators show significant relations to the receipt of CATR funds, and only one correlation coefficient is considered strong.
Chapter Five: Expenditure Impacts of the CATR Program

Chapter Five examines the expenditure impact of the CATR program. Much literature has found that revenue sharing or lump sum transfers may stimulate targeted expenditures more than the classical economic theory has predicted. The detection of this “flypaper effect” had gradually become a normal finding in empirical literature until the last two decades. Bird & Smart (2002) argued that taxpayers tend to think that intergovernmental transfers are their “free lunches” and are paid by other taxpayers. Current literature also identifies several theoretical and empirical reasons for the appearance of the flypaper effect.

Adopting Nagamine’s modified expenditure model, empirical findings shown in Chapter Five lend no support to the existence of the flypaper effect on the CATR program. The funds are found to have the equivalent expenditure effect as the taxable income variable. This result, although contradictory to several existing findings, provides evidence that local governments treat received CATR funds as their own-tax revenue, which is actually the goal of this program. Since neo-classical economics indicates that the existence of the flypaper refers to inefficiency, local governments in Taiwan use the CATR funds in an efficient way. However, this does not necessarily mean the current CATR program is the best.

The second finding of this chapter indicates that the expenditure effect of the current distribution approach is not different from pre-formula program. The measurement of different impacts between the pre- and post-formulating allotted tax revenue program provides no evidence in support of the second hypothesis of this chapter. This finding indicates that while distribution formula enhances the stability and predictability of
CATR, it does not change local governments’ spending behavior. One possible reason could be because many local governments still do not have enough resources to spend. With the limited resources, the flypaper effect is impossible. The other reason could be because the grant distribution still involves political interventions, although the distribution formula is explicitly written in the regulations. When the CATR distribution process involves political considerations, local governments do not have full discretion over the use of the funds. And the formula-based CATR is not different from the discretionary program. The spending behavior is therefore unchanged.

**Chapter Six: Local Financial Accountability**

*Chapter Six* evaluates the financial accountability mechanism implemented in all second level governments. The evaluation is based on four IMF standards of financial transparency. The evaluation has two focuses: (1) it reviews the legal framework that has been established in Taiwan to secure financial accountability; and (2) it evaluates the practical respects of local governments’ implementations on financial accountability. Through the IMF criteria, this chapter found that there are still some aspects that need to improve to attain the international standards of a good financial accountability mechanism.

Bottom-up accountability, the accountability to citizens, has gotten better in recent years, but there is still huge room for improvement. People in Taiwan have little chance to participate in budgetary decisions. The current participatory approach is through one-way information sharing instead of a two-way deliberative communication, and the latter is considered more democratic. People get used to passively waiting for released information, and local governments have full discretion over the information disclosure
policy. Released data are not consistent across all second level governments. For example, for periodic budget implementation information, some jurisdictions have separate monthly budget reports, some update the total numbers in their monthly statistical reports, and some include the information in accounting reports. The Taiwanese GASRB has set a series of GAAP, but local governments are in general ignoring those principles. Also, accounting policies are not attached to any accounting report.

Horizontal accountability, the accountability to other governmental agencies, is generally held. The separation of labor among executive, legislative, and auditing systems is clear and functioning well. The separation of labor between the local DOF and DBAS is also well implemented. The primary issue of horizontal accountability is related to internal oversights and external auditing. Internal oversights are implemented by accounting staff in each local agency and are not independent from the executive organizations. This may generate issues regarding objective and neutral oversights. Local officials consider internal auditing a process rather than a necessary function. The main concern regarding external auditing is that the redundant duty of voucher examinations weakens performance auditing, while the latter can bring more comprehensive, efficiency-based, and critical thinking of government operations.

Finally, vertical accountability is moderately held, but there is still a tendency toward financial dominance of the national government. Local finance is independent from the national government, and the latter only sets regulations and supervision guidelines to ensure a uniform standard is applied to all local jurisdictions and holds them accountable for fiscal outturns. In practice, the national government also is involved in local finances through intergovernmental transfers. This finding, together with the finding that citizen
participation in the budgetary process is weak, may hurt the responsive accountability of local governments in Taiwan.

**Implications and Suggestions**

The empirical work done in this dissertation not only addresses the current issues of the CATR program and local financial accountability, but also contributes in several ways to existing literature on equalization transfers, the flypaper effect, and the establishment of local financial accountability in unitary countries. This dissertation also offers insights into the design of an objective equalization program and an efficient local accountability system. Theoretical and practical implications for each of the three studies are presented below.

**Implications and Suggestions to Equalization Transfers**

Through the analysis done in *Chapter Four*, three implications for policy makers in Taiwan and one for the current literature on equalization transfers are provided.

First, policy makers should be more focused on the goal of the revenue sharing program. In Taiwan, there have been many debates about whether or not to include an index of “contribution” and “tax efforts” in CATR distribution formulas. It is important that an intergovernmental transfer program does not distort local tax policy, but this statement is true only when local governments have taxing power. In many unitary countries such as Taiwan, local governments do not have discretion over tax rates — new tax levying and tax rates adjustments are restricted. Therefore, if the distribution formula focuses heavily on tax collections, rich jurisdictions will be beneficiaries simply because of the mandatory tax scheme that is applied to all local governments. An index of
contribution, which means the amount the jurisdiction contributes to the CATR divisible pool, is not relevant to the equalization purpose. Policy makers should bear in mind that the central principle of an equalization transfer program is to ensure horizontal equity rather than encouraging tax competitions or rewarding fund contributors. An index of contribution is more likely to be an index of political expediency. In Taiwan, the encouragement of tax efforts should start from a revision of the Local Tax Act instead of revisions on the CATR distribution regulation.

Second, the distribution approach should be made transparent. The distribution — first by ratio, then by formula — is not considered transparent enough. Compared to the past, the current gap between municipalities and counties (cities), in terms of financial conditions, is significantly smaller. However, municipalities still have relatively more resources to support public services, while some counties and cities cannot even afford their basic level services through own-source revenue. One suggestion is to rethink distributing ratios. Current ratios are a result of historical shares of sales tax collections, but this factor has little to do with the goal of the CATR program — to achieve equalization on basic public service provisions among local jurisdictions. The other suggestion is to distribute CATR funds directly by a formula without distinguishing municipalities from counties (cities). Municipal governments were an administrative level higher than counties (cities), but since 1999, both municipal and county (city) governments are directly supervised by the national government. The differences in administrative status, governmental functions, and responsibilities diminished. The ratio, 43%, serves as a special guarantee to municipal governments that they will always be richer than counties (cities). In 2010, four more counties will be upgraded to municipal
governments, and the debates regarding the distribution ratio will only increase. Ultimately, policy makers need to bear in mind that a fully opened distribution process is necessary to secure the goal of transparency.

The third policy implication is that the distributing formula design should include poverty indicators and avoid “reward” factors. Taking the CATR program as an example, the current distribution formula uses financial variables rather than variables that highlight differences of counties and cities in history, demographic characteristics, and dominant industries. Although financial indicators directly represent existing local financial conditions, these socioeconomic and demographic variables reflect macro and local economic conditions more rapidly. In addition, the use of financial variables creates room for both the central and the local governments to game for distribution decisions. However, the objectiveness of the distributing formula needs to be emphasized, and financial variables simply cannot attain that goal. Further, the definitions of “basic financial need” and “basic financial revenue” must be stable and clearly stated. The calculation of “basic financial revenue” should include more poverty indicators to reflect financial disadvantages of poorer jurisdictions.

Finally, current literature states that a more stable, transparent, predictable, and objective formula-driven equalization transfer program is better than a discretionary one in achieving equalization. To achieve equalized inter-regional fiscal balance, formulas should be stable, transparent, predictable, and objective to higher standards than the CATR program. In the extreme case, the objective principle might need to be exactly followed. Also, the transparency principle should not only be followed throughout the distribution process, but in all distribution decision stages, as well.
Implications and Suggestions to Expenditure Impacts

Expansion of the CATR pool should be immediate. Through interviews with local DOF officials about their attitudes toward CATR funds, one interviewee indicated that there has been a continuing issue about expanding the funding pool to subsidize poor jurisdictions. The interviewee noted that the central government usually claims that the fund is not sufficient because “locally elected officials need more money to honor their election commitments.” However, the findings show that CATR funds are just used as they should be, and the increase of CATR receipts would increase financial ability. Sufficient financial ability is important in ensuring fiscal decentralization and avoids fiscal indiscipline, and therefore it is recommended that the CATR funding pool expand.

The finding that post-formula CATR funds do not change local government’s spending behavior implies that the current formula is no difference from the old discretionary decision. This finding leads to an empirical question: how is the formula made? The findings in Chapter Five provide supplemental evidence to the argument made in Chapter Four: the formula is not objective enough.

Additionally, findings may have an implication on the literature regarding the flypaper effect. Arguments about the estimation bias of measuring this effect have risen in recent decades, and empirical studies have found evidence on the inexistence of the flypaper effect after revising estimating equations. For example, Amusa, Mabunda, & Mabugu (2008) found no evidence in the case of South Africa, Worthington & Dollery (1999) claimed that flypaper effect disappeared when the endogenous problem was controlled, and Espinosa (2008) concluded there was no flypaper effect on the revenue sharing program in Mexico. A growing amount of literature indicates that the existence of the
flypaper effect, *the abnormal finding from the perspective of theory*, should not be viewed as normal in empirical works. This dissertation adopted Naganime’s institutionalized expenditure model and found that specifying the limited taxing power of government can really change the result. Without considering this institutional limitation of local governments in Taiwan, the estimate results would easily conclude the existence of the flypaper effect. Some of the current literature concludes the flypaper effect is a result of estimation bias, but this dissertation argues that the institutional factor should be another issue that needs to be addressed.

**Implications and Suggestions to Local Financial Accountability**

The evaluation conducted to assess accountability mechanism in local governments in Taiwan has two major policy implications for local financial accountability and for policy makers in Taiwan. First, through the investigation on how local financially accountability is ensured, local policy makers, program directors, and the central government are able to develop a better mechanism that encourages fiscal transparency in local governments. There are some aspects that need further emphasis. The internal oversight mechanism needs to be implemented independently, and external audits need to be focused more on performance auditing rather than traditional financial audits. Further, citizen participation in budgetary process should be improved. Freedom of governmental information needs to be increased, and citizens should be able to participate in budgetary decisions and evaluations actively through two-way deliberations.

The issue of central dominance can hurt responsive accountability. Many countries have embarked on fiscal decentralization reforms, but the traditional “centralized” process still hurt local financial accountability. Literature has identified the dangers of
soft budget constraints in unitary countries’ fiscal decentralization processes. *Chapter Six* found that Taiwan has this potential problem, not only because local finance depend heavily on transfers from the national government, but because the national government is also involved in the arrangement of fund use, as well. The overlapping responsibilities on the use of local resources could threaten fiscal accountability.

Finally, through the evaluation process, this dissertation found that a set of standards of local financial accountability is necessarily. The IMF codes are actually the guidelines for fiscal transparency, but transparency is only one of major parts of accountability. For example, interviews conducted in this dissertation found that auditors argue that the current external audit extends only to voucher examinations rather than performance auditing. However, the IMF codes do not specify the importance of holding governments accountable for financial performance. Further, the IMF codes are designed for all levels of government, but local finance is different from national finance in several ways. An applied scheme for evaluating local financial accountability is needed.

**Limitations**

Three studies in this dissertation have offered theoretical and empirical contributions to the current literature and the implemental aspect of local finances. Nevertheless, there are some limitations of this dissertation, both in applications of theories and in the methodology.

The first limitation is in the application of the analytical framework and models. In *Chapter Four*, this dissertation adopted two commonly used measurements of inter-jurisdictional financial disparities: coefficients of variations (CVs) and maximum to minimum ratios (MMRs). In a longitudinal study, these two measurements offer a broad
picture of the dynamic of inter-jurisdictional disparity. However, these measurements have drawbacks. First, CVs and MMRs do not reveal the information regarding financial conditions of whole jurisdictions. For example, a more equalized result could be due to a financial downturn in a richer jurisdiction. In addition, MMRs are very sensitive to outliers. The interpretation of these two disparity measurements need to be considered carefully, and descriptive statistics should also be used to provide additional information.

Chapter Five adopts Nagamine’s institutionalized flypaper effect model. This model deals with the budgetary institutional difference between Japan and other countries, but it does not take political institutions into consideration. Public choice theories have identified that governmental spending behavior is politically motivated, and thus the lack of a political factor would make the model incomplete. In particular, the relatively closed budgetary process in Japan might offer more opportunities for political intervention, but the model does not provide a framework to analyze this potential influence. Overall, Nagamine’s model fits contexts of local finances of Taiwan better than conventional expenditure models, but revisions are needed to make this model more reasonable, appropriate, and applicable to more countries.

The other issue related to the application of existing analytical scheme is, as mentioned in the previous section, the application of the IMF codes to evaluate local financial accountability in Taiwan. The codes are developed for each country’s self-evaluation purpose, and it addresses financial transparency at the national level more than at the local level — although it does not specify that the usage of the codes should be limited to the national level. Applying this evaluation scheme, many locally specific features are overlooked. For example, further definition of vertical accountability may be
needed to identify if the national government is overly dominant in the local financial accountability mechanism.

The second limitation relates to the inconsistency and the low availability of data. As mentioned in Chapter Five, the data of county (city) personnel expenses for the period 1992-2001 are un-audited. Although there should be very minor differences between audited and un-audited personnel expenses, since it is regulated by law, accurate and consistent data are always a goal for quantitative research. The limited availability of demographic and socioeconomic data for Taiwan’s local governments could be another limitation in examining the expenditure effect of the CATR program. Earlier empirical works on the flypaper effect have been criticized for the lack of demographic, social, and economic parameters, and the results could overestimate the grant variable. Although Nagamine’s model assumes local general expenditures are irrelevant to local social and economic status, it is still desirable to include some of these variables to see their interactions with the dependent variable.

The sampling could be another source of data limitation. The interviewee localities may not represent all 23 jurisdictions. The recruiting process of interview participation is depressed. Local officials in Taiwan are more conservative in facing the public and expressing their thoughts, although local DBAS are relatively open to the public and officials from DBAS are more willing to participate in interviews. Most interviews with local audit officials are conducted through instant message software or email exchanges, and only four local DOFs participated in the accountability research. Although it could be problematic to say that the sample represents the whole population, this is what this dissertation can do for now.
Finally, the estimate model presented in Chapter Five has some limitations. The model may have a concern of collinearity. Since collinearity can reduce the significance of individual explanatory variables and could probably cause unexpected change of the coefficients (Hamilton, 2003), the pursuit for the elimination of the collinearity concern is always preferred. Currently, the multicollinearity of the model is tolerant under the rule of thumb of VIF=10 and tolerance =0.1, while the variables W and CATR are close to the cutoff value of 10 (and 0.1). Traditional approaches to reduce the collinearity include amplifying the sample size, employing some forms of data transformation, or dropping some variables. With respect to the current model, this dissertation has included the latest data. The transformation of the variable may make the interpretation of the CATR and Y variables difficult, but the variables are too important to be dropped from the current model. With better data availability, efforts for reducing collinearity should be taken in the future.

Directions for Future Research

Overall, this dissertation contributes to current literature of local finance, fiscal decentralization, local financial accountability, and equalization program in several ways. However, additional work is needed to improve and refine the theoretical framework and empirical investigations. In this final section, some suggestions are given to direct potential paths for future studies.

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86 The latest audited financial data are up to year 2007. As such, this dissertation has tried to include as many observations as it could. Since only eight years of data of the post-formula CATR period program are available, this dissertation includes eight-year per-formula data to construct the model. However, the CATR program is going to have another significant reform in 2011 due to the readjustment of administrative jurisdictions in 2010, so a modification has to be made in the future if the study on CATR’s expenditure impact is extended further.
First, this dissertation found a gap between the expectations and realities of the equalization function with respect to lump-sum transfers. However, this dissertation has not researched the factor that causes this gap. “What makes formula-driven equalization programs not equalizing?” is an interesting topic for future research. For empirical research, more evidence is needed to address this issue. For theoretical arguments, a framework is needed to analyze elements that may decrease the objectiveness of a formula-driven equalization program. The political expediency hypothesis might be a good start for building the theoretical framework.

The second potential path for future research is the study on the design of good formulas for equalization programs. There has been significant amount of literature on the design of equalization aids in the United States. For example, Louis, Jabine, & Gerstein (2003) suggest several applications of appropriate formula elements, the important data sources, and the use of official or second hand statistics. Many current state aid programs for school districts also adopt variables that reflect demographic differences across recipient jurisdictions. Another group of literature argues that formulas of equalization programs should be based on the gap between expenditure needs and revenue capability (Downes & Pogue, 2002; Helen F Ladd & Yinger, 1994; Martinez-Vazquez & Boex, 2006). As was introduced in Chapter Four, the distribution formula of CATR for counties (cities) is composed of the relative sizes of (1) the gap between financial needs and financial revenue; and (2) business sales. However, this distribution formula has not brought a more equalized financial result across the 23 jurisdictions in Taiwan — in contrast to some literature. Future research on the CATR program may investigate how to design a better distribution formula. Simulations of different formulas
may discover the most appropriate one, and state aid programs for equalization education in the United States may provide several models or modules for simulation.

The third suggestion is on the modification of flypaper effect models. The Japanese and Taiwanese cases have shown that institutional differences may lead to different interpretations of estimated coefficients. Most Asian countries use revenue-sharing programs similar to the CATR or the Japanese program to eliminate interregional fiscal disparities, but there is not an appropriate model to examine how recipient governments use those funds. Since Nagamine’s model has some potential limitations, the development of a modified flypaper effect model can provide more accurate examinations on expenditure impacts of those programs.

Further, by using the panel data, this dissertation finds no evidence of the existence of the flypaper effect. However, it is possible that CATR’s expenditure impacts vary across jurisdictions because each jurisdiction has a unique fiscal structure. An initial test of the flypaper effect for all 21 counties and cities is presented in Appendix 9, with OLS estimates and only $W$, $Y$, and $CATR$ as independent variables.\(^{87}\) The results show that substantial differences in the CATR coefficients exist across counties and cities. Future research may be able to explore further the different expenditures (if any) and find the reasons for the difference. A possible path would be to “nest” local jurisdictions with some financial or economic characteristics, by doing so it may be possible to identify whether or not there exists some political considerations in the distribution formulas.

This dissertation also found potential paths for future research on local financial accountability, especially in eastern Asia. Most countries in eastern Asia have insufficient

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\(^{87}\) The sample year is only 16 years, while the original model has eight explanatory variables. To simplify the regressions model, the test for individual flypaper effect only uses $W$, $Y$, and $CATR$ as the right hand side variables.
experience in holding local governments accountable for financial outruns. Also, the participatory mechanism is still a “mysterious” part of the local finances in those countries. Although there has been a lot of literature on budget participation in the United States, very little is related to the model of participating in budgeting in Asian countries. In general, people in these countries are taught to be passive on public affairs, and the participatory mechanism is more often one-way information sharing. Future research could focus on studying of citizen participation in budgeting in Asian countries and its impact on financial accountability.

Governmental accounting has been overlooked in Taiwan’s public finances for a long time, but in the last decade, the establishment of GASRB and the issuances of Taiwanese GAAPs have raised some interest. The quality of financial reports has been criticized on several aspects, and some criticism is related to the lack of accounting policy in financial and budgetary documents. Future studies on this topic could borrow the experience of the United States for their applications of GAAP in governmental financial reports. This kind of policy research may have an essential contribution to Taiwan’s local financial accountability.

Finally, future studies may also address issues related to the audit function. Taiwan’s external audit is conducted by the independent audit system, and the integrity of the oversight is assured. However, it is more often traditional audit, and primarily voucher examinations. A comparative case study of performance versus traditional audits may give policy makers some information about establishing an efficient auditing system that can carry out quality financial accountability.
References


Chao, Y.-c. (2002). Problems of local finances and the distribution of CATR funds.
National Policy Forum, 2(1), 76-80.


Jacobs, C. (2007). *Community Capitals: Political Capital.* South Dakota: South Dakota State University College of Agriculture & Biological Sciences (Community Capitals Series No.06)


■ Clarity of Roles and Responsibilities

1. The responsibility of different levels of governments, and the relationships between them, should be clearly defined. (IMF: 1.1.3).
2. The collection, commitment, and use of public funds should be governed by comprehensive budget, tax, and other public finance laws, regulations, and administrative procedures. (IMF: 1.2.1).
3. Laws and regulations related to the collection of tax and non-tax revenues, and the criteria guiding administrative discretion in their application, should be accessible, clear, and understandable. Appeals of tax or non-tax obligations should be considered in a timely manner. (IMF: 1.2.2).

■ Open Budget Process

4. A description of major expenditure and revenue measures, and their contribution to policy objectives, should be provided. Estimates should also be provided of their current and future budgetary impact and their broader economic implications. (IMF: 2.1.3).
5. A summary of relevant accounting policies should accompany all reports. These should describe the basis of accounting applied in preparing the reports and disclose any deviations from generally accepted accounting practices. (OECD: 3.1).
6. A timely midyear report on budget developments should be presented to the legislature. More frequent updates, e.g. monthly or quarterly reports, should be published. (IMF: 2.2.3; OECD: 1.3).
7. Extra revenue and expenditure proposals during the fiscal year should be presented to the legislature in a manner consistent with the original budget proposal. (IMF: 2.2.3).
8. Audited financial accounts and audit reports should be presented to the legislature and released within one year of the end of the fiscal year. (IMF: 2.2.4).

■ Public Availability of Information

9. The budget documents, including the final accounts, and other published fiscal reports should cover all budgetary and extra-budgetary activities of the government. (IMF: 3.1.1).
10. Receipts from all major revenue sources should be separately identified, and expenditure should be classified by economic, functional, and administrative category (IMF: 3.1.4; IMF: 3.2.2; OECD: 1.1).
11. The timely publication of fiscal information should be a legal obligation of the government, and the advance release calendar for the fiscal information should be announced publicly. (IMF: 3.3.1 & 3.3.2).
12. The annual budget and final accounts should indicate the accounting basis used in the compilation and presentation of fiscal data. Generally accepted auditing practices should be specified and followed. (IMF: 4.1.2; OECD: 3.3).

13. Government activities and finances should be internally audited, and the audit procedures should be open to review. (IMF: 4.2.5; OECD: 3.2).

14. Public finances and policies should be subject to scrutiny by a national audit body that is independent of the executive. (IMF: 4.3.1; OECD: 3.3).

15. The national audit body should submit all reports to the legislature and publish them. Mechanisms should be in place to monitor follow-up actions. (IMF: 4.3.2; OECD: 3.3).
### Appendix 2: Translations of Names of Counties and Cities

<table>
<thead>
<tr>
<th>Chinese Name</th>
<th>English Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>臺北縣</td>
<td>Taipei</td>
</tr>
<tr>
<td>臺北市</td>
<td>Taipei M.</td>
</tr>
<tr>
<td>高雄市</td>
<td>Kaohsiung M.</td>
</tr>
<tr>
<td>新竹縣</td>
<td>Hsinchu</td>
</tr>
<tr>
<td>嘉義市</td>
<td>Chia-I C.</td>
</tr>
<tr>
<td>新竹市</td>
<td>Hsinchu C.</td>
</tr>
<tr>
<td>臺南市</td>
<td>Tainan C.</td>
</tr>
<tr>
<td>臺中市</td>
<td>Taichung C.</td>
</tr>
<tr>
<td>臺南縣</td>
<td>Tainan</td>
</tr>
<tr>
<td>苗栗縣</td>
<td>Miali</td>
</tr>
<tr>
<td>花蓮縣</td>
<td>Hualien</td>
</tr>
<tr>
<td>臺中縣</td>
<td>Taichung</td>
</tr>
<tr>
<td>屏東縣</td>
<td>Pingtung</td>
</tr>
<tr>
<td>彰化縣</td>
<td>Changhua</td>
</tr>
<tr>
<td>桃園縣</td>
<td>Taoyuan</td>
</tr>
<tr>
<td>南投縣</td>
<td>Nantou</td>
</tr>
<tr>
<td>基隆市</td>
<td>Keelung C.</td>
</tr>
<tr>
<td>雲林縣</td>
<td>Yunlin</td>
</tr>
<tr>
<td>嘉義縣</td>
<td>Chia-I</td>
</tr>
<tr>
<td>澎湖縣</td>
<td>Penhu</td>
</tr>
<tr>
<td>宜蘭縣</td>
<td>Yilan</td>
</tr>
<tr>
<td>高雄縣</td>
<td>Kaohsiung</td>
</tr>
<tr>
<td>臺東縣</td>
<td>Taitung</td>
</tr>
</tbody>
</table>

**Source:** *Principles of Translations, Decree No. 0910042331*, issued by the Executive Yuan on August 22, 2002.

**Note:** C. is the short form of city. M. is the short form of municipalities. Although Taipei County has been ungraded to semi-municipality in 2008, I do not specify it in this table. Others that do not have a C. or M. are counties, except for Taipei and Kaohsiung.
Appendix 3: Letter for Invitation of Participation

Dear Sir/Madam,

My name is Nai-Ling Kuo, and I am a Ph.D. candidate at the Rockefeller College, State University of New York at Albany. I am writing to invite you to participate in my doctoral dissertation. My doctoral dissertation will be examining the fiscal decentralization in Taiwan. Specifically, I am concerned the change of CATR funds distributions happened in 1999, the enactment of Regulations of Distributions of Centrally-Allotted Tax Revenue and the adequacy of local financial accountability in Taiwan. The purpose of my dissertation is to provide a comprehensive evaluation of the current CATR program and Taiwan’s local fiscal accountability.

I am requesting your involvement in this project. Any information you provide will be confidential and will be used for this research only. This will be a face-to-face interview about your perceptions of decision-making on spending/processes of preparing the final settlement reports/application process of special CATR funds\(^88\). The interview question(s) will be loosely structured, and you do not need to answer all of the questions. The interview will be conducted in your office or anywhere you prefer and will last approximately 30-45 minutes.

Your participation in this interview will be an important component of my dissertation, and your assistance in answering these questions will provide insights into Taiwan’s fiscal decentralization and have significant policy implications for the future enhancement of local finances. Your agreement and participation are eagerly requested and greatly appreciated. If you would like to participate in this project, please sign your name on the consent form attached with this letter and send/email it back to me. After receiving your consent form of participation, I will contact you with further information about this project.

If you have any questions about this project, please feel free to contact me. Should you have any question regarding your rights as a subject, please contact the Compliance Office, Office for Sponsored Programs, University at Albany, SUNY at 518-4374550 or visit their website at http://www.albany.edu/research/OSPindex.htm.

Thank you for your time considering my request.

Nai-Ling Kuo  
Ph.D. Candidate  
University at Albany, SUNY  
(Address)

\(^88\) This is subject to the theme of each interview.
Appendix 4: Consent Letter

Nai-Ling Kuo  
Ph.D. Candidate, Department of Public Administration and Policy  
University at Albany, SUNY  
xx-xxxx-xxxx  
xxx@xxx.xx

Consent to Participate

Your participation in this research, titled *Fiscal Decentralization in Taiwan: A case study for the Centrally-Allotted Tax Revenue (CATR) program*, conducted by Nai-Ling Kuo, the Ph.D. candidate of the University at Albany, SUNY, is completely voluntary. Please be informed that refusal to participate will involve no penalty, and you are free to skip any question that causes discomfort. Your personal information will not be revealed and you will not be asked questions that are able to identify you.

This dissertation is an overview of Taiwan’s CATR program, and the interview you will be participating in involves in an evaluation of Taiwan’s local financial accountability mechanism. The purpose of this dissertation is to provide policy recommendations for the government to consider future improvements of the CATR program and local financial accountability mechanism, as they are considered contemporary issues of Taiwan’s current local finances.

You will be participating in a 30-40 minutes semi-structured interview, which composes of four general questions and possible following questions in corresponding to your answers to the general questions. I reference you to the appendix for the four general questions. Interviews will be tape recorded or note taken, and all recorded data will be locked in a secured box after translations are done by the research principal. The translations will be done in an independent individual room. The manuscripts will also be locked in a secured box after the results of the research come out. No one will have access to those records and manuscripts except for the research principal. You are able to read the manuscript of your interview only. All responses will be held in strict confidence, and used only for research purposes. Results of this study may be disseminated or made publicly available, but they will only be presented in an aggregate form to ensure that no individual participant can be identified by their answers. This dissertation prospectus has been approved by the Institutional Review Board of University at Albany, SUNY on 10/21/2008. Approval of this project signifies that the procedures may adequately protect the rights and welfare of the participants.

There is no risk involved in participating in the interview, and your participation contributes to a further understanding of Taiwan’s current local financial accountability system, which has been under-researched for several decades, and to developing improvement plans for local financial transparency. The results of this study may also
help you to know about the implementations of local financial accountability system in other local governments.

Questions or concerns about the research study should be addressed to the research principal, Nai-Ling Kuo at (886) 912-445919 or knl0713@gmail.com. If you have any questions concerning your rights as a research participant that have not been answered by the investigator or if you wish to report any concerns about the study, you may contact the University at Albany Office of Regulatory Research Compliance at 1-518-442-9050 (U.S. toll-free 800-365-9139) or orrc@uamail.albany.edu.

I have read, or been informed of, the information about this study. I hereby consent to participate in the study. I have given my permission to the research principal to tape record note take the interview (please indicate one or both).

To indicate your informed consent to the interview, please send this form back to the research principal.

Note: This consent letter has been approved by the University at Albany IRB on October 21st, 2008.
Appendix 5: Interview Protocol

1) Could you tell me the process of preparing the Budget Settlement Reports/ Audit Reports/ applications for special CATR funds?

2) Do you apply internal audit/control during the preparation of the Budget Settlement Reports/ Audit Reports? If so, is this information publicly accessible?

To DBAS:
2a) DBAS is responsible for pre-auditing of county (city) spending, rectifying the budget numbers reported by each agency. Could you please tell me how do you reach a consensus if you have different numbers with agency’s self-report?
2b) I know DBAS also assists county (city) internal auditing activities. Could you please tell me the process or practices of your internal auditing?

To OA:
2c) I know OA is responsible for assisting county’s (city’s) internal auditing. Could you tell me the process and steps you take to ensure the current and appropriateness of county (city) spending?
2d) OA is also responsible for post-auditing of county’s (city’s) final account reports. Could you tell me how do you reach consensus with each agency when you have different opinions about a payment?

3) Do you prepare any regular and timely report of budget and extrabudget outturns during the fiscal year?

Questions 4) through 6) only to DOF

4) Do you require the recipient government to report the use of special CATR funds?

5) Can other local governments (which mean those who do not apply for the fund or do apply for but are rejected) acquire the information about the distributing procedure and results?

6) Is there any (punishing) mechanism to prevent local government from abusing special CATR funds?
Appendix 6: Scatter Plot, CATR Receives vs. General Expenditure, 23 jurisdictions
Appendix 7: Taxable Base for Four Major Local Tax Revenue (Allotted Tax Revenue excluded)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Land Value</th>
<th>Land Value Increment</th>
<th>house value</th>
<th>Deed Value</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>3,322,568,035</td>
<td>429,700,398</td>
<td>1,988,081,266</td>
<td>135,827,582</td>
<td>5,876,177,281</td>
</tr>
<tr>
<td>1993</td>
<td>3,345,589,812</td>
<td>527,045,845</td>
<td>2,108,585,512</td>
<td>147,418,648</td>
<td>6,128,639,817</td>
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<tr>
<td>1994</td>
<td>3,939,800,491</td>
<td>428,059,079</td>
<td>2,370,302,008</td>
<td>190,695,469</td>
<td>6,928,857,047</td>
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<tr>
<td>1996</td>
<td>4,017,101,869</td>
<td>325,921,570</td>
<td>3,233,980,785</td>
<td>233,267,303</td>
<td>7,810,271,527</td>
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<tr>
<td>1997</td>
<td>4,461,054,589</td>
<td>524,754,104</td>
<td>2,833,186,397</td>
<td>212,333,002</td>
<td>8,031,328,092</td>
</tr>
<tr>
<td>1998</td>
<td>4,595,341,239</td>
<td>549,371,512</td>
<td>2,892,868,461</td>
<td>208,741,424</td>
<td>8,246,322,636</td>
</tr>
<tr>
<td>1999</td>
<td>4,592,415,672</td>
<td>519,521,970</td>
<td>2,875,475,763</td>
<td>202,408,711</td>
<td>8,189,822,116</td>
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<tr>
<td>2000</td>
<td>4,773,583,521</td>
<td>726,068,095</td>
<td>2,863,016,481</td>
<td>275,248,165</td>
<td>8,637,916,262</td>
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<tr>
<td>2002</td>
<td>4,872,114,367</td>
<td>642,322,071</td>
<td>3,002,871,007</td>
<td>177,358,737</td>
<td>8,694,666,182</td>
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<tr>
<td>2003</td>
<td>4,899,069,192</td>
<td>818,379,972</td>
<td>3,058,378,372</td>
<td>197,338,787</td>
<td>8,973,166,323</td>
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<tr>
<td>2004</td>
<td>4,949,158,135</td>
<td>824,736,578</td>
<td>3,119,678,924</td>
<td>222,513,147</td>
<td>9,116,086,784</td>
</tr>
<tr>
<td>2005</td>
<td>4,999,795,947</td>
<td>663,631,598</td>
<td>3,168,626,653</td>
<td>225,166,662</td>
<td>9,057,220,860</td>
</tr>
<tr>
<td>2006</td>
<td>5,096,379,762</td>
<td>582,284,753</td>
<td>3,308,346,846</td>
<td>238,113,723</td>
<td>9,225,125,084</td>
</tr>
<tr>
<td>2007</td>
<td>5,539,406,649</td>
<td>609,964,561</td>
<td>3,430,195,860</td>
<td>231,833,687</td>
<td>9,811,400,757</td>
</tr>
</tbody>
</table>

Data Source: 2007 Yearbook of Tax Statistics, Ministry of Finance
* Data reflects nominal dollar numbers
* Data includes 21 counties and cities and Taipei and Kaohsiung Municipalities
Appendix 8: Tax Collections for Four Major Local Tax Revenue  
(Allotted Tax Revenue excluded)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Total Local Tax Collected</th>
<th>Land Value Tax</th>
<th>Land Value Increment Tax</th>
<th>House Tax</th>
<th>Deed Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>262,469,093</td>
<td>31,193,930</td>
<td>186,449,627</td>
<td>28,300,746</td>
<td>10,182,057</td>
</tr>
<tr>
<td>1993</td>
<td>269,296,807</td>
<td>35,208,277</td>
<td>186,829,823</td>
<td>29,243,895</td>
<td>10,949,349</td>
</tr>
<tr>
<td>1995</td>
<td>257,223,420</td>
<td>38,261,352</td>
<td>155,354,082</td>
<td>35,871,143</td>
<td>17,615,701</td>
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<tr>
<td>1996</td>
<td>220,302,122</td>
<td>42,361,416</td>
<td>115,772,374</td>
<td>38,850,039</td>
<td>17,153,317</td>
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<tr>
<td>1997</td>
<td>237,798,486</td>
<td>42,291,080</td>
<td>132,491,905</td>
<td>41,594,479</td>
<td>15,506,076</td>
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<tr>
<td>1999</td>
<td>208,951,434</td>
<td>46,853,230</td>
<td>101,460,174</td>
<td>45,661,086</td>
<td>13,096,702</td>
</tr>
<tr>
<td>2000</td>
<td>339,296,481</td>
<td>92,039,200</td>
<td>123,493,565</td>
<td>48,435,990</td>
<td>15,267,197</td>
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<tr>
<td>2001</td>
<td>203,011,753</td>
<td>50,920,369</td>
<td>42,261,670</td>
<td>48,055,633</td>
<td>8,492,646</td>
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<tr>
<td>2002</td>
<td>209,264,439</td>
<td>50,169,374</td>
<td>47,900,078</td>
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<tr>
<td>2003</td>
<td>228,735,957</td>
<td>50,762,035</td>
<td>61,040,949</td>
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<td>2004</td>
<td>255,699,219</td>
<td>52,617,195</td>
<td>81,276,138</td>
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<tr>
<td>2005</td>
<td>261,734,340</td>
<td>53,705,856</td>
<td>81,664,161</td>
<td>50,876,888</td>
<td>13,178,008</td>
</tr>
<tr>
<td>2006</td>
<td>260,971,473</td>
<td>54,660,359</td>
<td>76,547,345</td>
<td>52,493,513</td>
<td>14,013,856</td>
</tr>
<tr>
<td>2007</td>
<td>265,133,957</td>
<td>59,008,809</td>
<td>74,682,382</td>
<td>53,882,845</td>
<td>13,636,896</td>
</tr>
</tbody>
</table>

Data Source: 2007 Yearbook of Tax Statistics, Ministry of Finance  
* Data reflects nominal dollar numbers  
* Data includes 21 counties and cities and Taipei and Kaohsiung Municipalities
### Appendix 9: Expenditure Impact, Individual Jurisdiction

<table>
<thead>
<tr>
<th>County (City)</th>
<th>CATR</th>
<th>Y</th>
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Note: ** indicates coefficient is significant at 95% confident level; *
* indicates coefficient I significant at 90% confident level.