Urban Core vs. Suburban Fringe: Asymmetrical Fiscal Effects of Tax and Expenditure
Limitations in Metropolitan Areas

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ABSTRACT

This dissertation assesses the effects of tax and expenditure limitations (TELs) on principal items of revenue, largest components of expenditure and the levels of public debt of local governments serving urban cores and suburban fringes of the largest metropolitan areas in the US.

The first part of the dissertation consists of 4 chapters. Chapter 1 examines the formal aspects of TELs; Chapter 2 explores historical evolution of fiscal limits between 1800 and 2009; Chapter 3 examines substantive nature of TELs; and Chapter 4 reviews the extant research on TELs. The past research suggests that TELs are associated with increased centralization, diminished government responsiveness, and suboptimal outcomes of the entire local public sector.

The second part of the dissertation, Chapters 5-6, presents the empirical study of the asymmetrical fiscal effects of TELs on different geographic segments of metropolitan areas. The study employs the quasi-experimental multiple comparison group time series research design and measures fiscal outcomes associated with the imposition of TELs. It relies on a standard fixed effects dummy variable OLS model with constant slope coefficients and variable intercept. The sample ($N = 166,530$) contains 7 periods of observation at 5 year intervals of 745 metropolitan counties from 270 metropolitan areas. The unit of analysis is the metropolitan county area.

The study found that in the urban cores and suburban fringes of metropolitan areas: 1) overall fiscal effects of TELs follow general asymmetrical trends identified by past research; 2) specific fiscal effects varied by comparison group, type of TEL imposed, and measure of fiscal outcome; 3) local governments in the urban cores are more adversely affected by TELs; 4) general revenues and expenditures declined in all comparison groups but urban core local governments experienced larger declines; 5) in all comparison groups own source revenues declined, intergovernmental revenues increased, spending on public education and public safety declined with larger declines in the urban cores; 6) long-term debt (especially non-guaranteed) has been rising more quickly in the urban core segments of metropolitan areas; and 7) in general, the effects of TELs were more negative and more pronounced for local governments experiencing fiscal stress.

In Memory of

Tamara I. Drozdova and Mikhail (Moshe) M. Zinde

My teachers who have always believed in me

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INTRODUCTION

The world history of is full of examples of tax resistance. Taxation was invented, and remains the primary instrument to finance government. Although specific forms of national administrations may have differed drastically, one feature of government has remained consistently stable throughout the centuries and regimes – the need to collect taxes. At the same time, taxation often has been unfair and oppressive. As a consequence the popular response to tax enforcement measures has been frequently openly rebellious.

For instance, Burg described 463 tax protests, revolts, riots, rebellions, and anti-tax popular movements throughout the last four thousand years, from the Urukagina Tax Reduction Reform c. 2350 BCE in the Sumerian city-state of Lagash to the more recent 2002 Tax Opposition Protest against the UK government's "taxation without representation" on Ascension Island (Burg, 2004).

Burg's survey also revealed that although the occurrence of anti-tax movements has gradually subsided from its peak in the eighteenth century, their geographic distribution has increased. Tax protests are no longer confined to only a few "hot spots" where citizens are being overtaxed or think they are.

The twentieth century serves as a good illustration of this trend. For instance, in 1989-1990 Britain witnessed a full blown civic rebellion against the poll tax, which then prime-minister Thatcher had attempted to implement against strong popular sentiment (Burns, 1992). In the same period continental Western Europe went through a series of successive anti-tax movements targeting national income taxes. In one country after another citizens inspired by the success of their neighbors in reducing tax burden have changed national tax codes by voting for reformist parties.

In another instance, in the 1990s the EU has been forced to deal with the rampant growth in ingenious tax avoidance schemes, which often involved multiple domiciles; special tax zones[1], or more traditional tax havens[2] (Confalonieri & Newton, 1995; Listhaung & Miller, 1985). Since 1900s Asia has witnessed recurring peasant tax protests in India, China and Indonesia (Prazniak, 1980; K. Young, 1994). In turn Africa had its own fair share of anti-tax movements, for example, the Zulu Bambatha Rebellion of 1906 (Redding, 2000) and the recent 1998 Arumeru Tax Revolt in the Arusha region of Tanzania (Kelsall, 2000) to name a few.

Nevertheless, the last century does not even come close to the eighteenth that can be called the champion of anti-tax protestation. In the eighteenth century the anti-tax protests reached their peak, and most occurred in the colonial Americas. For instance, Cuba witnessed subsequent tax rebellions in 1713, 1765 and in 1777 (Fischer, 1996), in Peru taxpayers revolted in 1789[3] (Campbell, 1972), while Haiti had its Grand Blancs Rebellion in 1793 (Rogozinski, 2004, p. 164). One dispute over trade taxes in the Caribbean resulted in a war of 1739-1748. It is known under a comical name of "the War of Jenkins Ear" (Rogozinski, 2004, p. 146).

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[1] Such as the Isle of Man or the Channel Islands of Guernsey and Jersey
[2] Andorra, Lichtenstein, Monaco, Malta, San Marino, the Canary Islands
[3] Two days after the news about the storming of the Bastille in Paris reached the capital Lima on August 23, 1789

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The British colonies in North America were particularly affected by unjust taxation during this period (Braudel, 1995; Rakowe, 2003). Alexis de Tocqueville believed that the excessive taxes on the colonists directly caused the American Revolution (de Tocqueville, 1955). The Boston Tea Party of 1773 remains the most famous American anti-tax revolt. In essence, it was the dispute between the British Parliament and the American colonists over the right to tax (J. Adams, 1983). However, eighteenth century anti-tax revolts in the US were not limited only to opposing overseas taxing authorities. Americans often resisted taxation by their own government.

For instance, the Whiskey Rebellion of 1791-1794 was fought over alcohol and carriage taxes (Slaughter, 1986). It ushered a new kind of fiscal relationship in the US federal system strongly advocated by the secretary of the treasury Alexander Hamilton. He believed in the power of the federal government to tax. It also marked the first and only time when the president of the United States personally participated in the suppression of popular uprising.

Less well known John Fries's Rebellion of 1800 was the first documented US anti-property tax movement. It was directed against federally levied direct tax on houses. The immediate cause was the disagreement over the property assessment practices[4] (Newman, 2005). The list of the major eighteenth century US anti-tax uprisings also includes the Connecticut Artisan Protest of 1792, which was relatively brief, but highly effective in reducing local taxes on craftsmen (Walsh, 1985).

America's taxation clearly had a rough start. Yet the spirit of eighteenth century tax rebels lived on. Thirty years ago it received a new boost. The passage of Proposition 13 in California in 1978 was a symbolic turning point in the history of the US anti-tax movement. Some authors even defined it as revolutionary (Oakland, 1979; Pascal, 1979; Puryear & Ross, 1979).

Proposition 13 was so emblematic and radical because on the one hand it represented a logical continuation of the Single Tax Movement of the Progressive Era (A. Young, 1916) and numerous tax revolts of the Great Depression (Beito, 1989; Schwarz, 1964; Thornton & Weise, 2001), while on the other hand the severity of its anti-tax measures matched the decisiveness of the Sons of Liberty. Kim comments with regard to this issue that "the tax revolt of the 1970s reflected the change in tastes and preferences of local residents as consumers of government services" (K. Kim, 1992, pp. 9-10). Such change in citizens' preferences had directly affected the structure of local governance, the scope of local public sector, and the instruments of its financing.

This dissertation studies fiscal consequences of the modern tax revolt. In particular, it investigates the asymmetrical effects of various tax and expenditure limitation measures on the finances of local governments. In the last three decades the phenomenon of tax and expenditure limitations has been studied from numerous angles. However, despite such substantial research program some unexplored issues remain. One of them is the question of the nature of fiscal effects of local tax and expenditure limitations on local governments serving different geographical locales, such as the urban cores, and the suburban fringes of metropolitan areas.

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[4] the value of the houses was assessed by the number and size of the windows and the procedures were generally perceived as very unfair

The dissertation consists of two parts. Part one (chapters 1- 4) introduces the topic of tax and expenditure limits, presents their formal aspects, and then reviews extant literature relevant to the research question. Special attention is paid to the examination of past studies of the fiscal effects of tax and expenditure limitations on local governments.

Part two (chapters 5-6) presents the empirical study. It compares the effects of tax and expenditure limits on the revenues, expenditures and debt of general and special purpose local governments serving urban cores of metropolitan areas with the fiscal effects experienced by local governments operating in the suburban fringes of metropolitan areas.

The second part of the dissertation introduces the principal research question, the research methodology, and then discusses the findings of the study, its contribution of to the fields of public administration and public finance, and proposes some new venues for future research on the topic.

PART I. TAX AND EXPENDITURE LIMITATIONS: THEORY AND PAST RESEARCH

The first part of this dissertation surveys the extant theoretical literature, and empirical research on tax and expenditure limitations. Its primary objective is to systematize the current body of knowledge on the subject, provide a firm conceptual foundation for the subsequent empirical study, and place its findings in the broader context of this line of inquiry. This review also attempts to describe tax and expenditure limitations as a complex fiscal phenomenon, and a product of multiple causal relations.

The existing body of literature on fiscal limits[5] can be divided into roughly four distinct categories:

1) Formal aspects of tax and expenditure limitations (definitions, typologies, inventories, etc.);

2) History of fiscal constraints in the United States;

3) Theory of fiscal constraints on government (including research on voter support);

4) Empirical studies of the effects of tax and expenditure limitations on public sector.

The next four chapters will map this body of knowledge thematically, emphasizing its most important questions, and analyzing accumulated objective facts, findings, and conclusions.

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[5] Throughout the dissertation the terms tax and expenditure limitations, fiscal limits, fiscal constraints, fiscal limitations will be used interchangeably. There are no significant conceptual differences between these terms.

CHAPTER 1. FORMAL ASPECTS OF TAX AND EXPENDITURE LIMITATIONS

This chapter presents the review of research on the formal aspects of tax and expenditure limitations. It covers the questions of definition, classification, and general inventory of currently active fiscal limits. The objective of this chapter is dual, descriptive – to provide as detailed depiction as possible of the most pertinent issues of tax and expenditure limitations forms; and also pragmatic – to identify such definition and typology of fiscal limits that will be the most appropriate for the purposes of the empirical study of this dissertation. To illustrate the gradual development of the formal aspects of tax and expenditure limitations (or TELs as they are commonly known) the review will follow chronological order of studies.

1.1. Definitions

One of the findings of this review is that past theoretical and empirical research did not rely on a single definition of tax and expenditure limitations. This is especially true for the studies undertaken in the 1970s-80s.

For instance, at that time TELs were defined as "constitutional restrictions on spending or taxation designed to curb excesses associated with budgetary process" (Abrams & Dougan, 1986, p. 104), as "statutory or constitutional fiscal limits restricting government expenditures or revenues" (Pascal, 1979, p. 73), as "statutory or legislative restrictions on taxation and expenditure" (Courant & Rubinfeld, 1981, p. 290), as "measures restricting the growth and/or level of taxing and spending" (Brazer, 1981, p. 21), as "fiscal restraints, which change the balance of taxes used to finance public services" (DeTray, Fernandes, Pascal, & Caggiano, 1981, p. 8), as "state imposed controls on local taxing and spending power" (Ladd, 1978, p. 2; Ladd & Tideman, 1981, p. 11), as "a policy tool intended to reveal popular preferences" (J. Wright, 1981, p. 13), as "general rules that dictate the spending or tax policies" (Merriman, 1986, p. 353), and simply as "measures that limit the authority of governments" (Sherwood-Call, 1987, p. 57).

As the research on TELs progressed in the 1990s, definitions gradually became more uniform and more precise. For instance, some authors defined TELs from a legal rather than purely fiscal perspective as "laws that represent both constitutional and statutory enactment of two basic types" (Elder, 1992, p. 49), as "legislation constraining the size of the respective state sectors to limits specified in the legislative language" (Terrell, 1993, p. 2), or merely as "laws limiting state and local tax and expenditure growth" (Rueben, 1997, p. 7).

In contrast, others treated TELs as a predominantly fiscal phenomenon. Of those, several authors defined TELs narrowly as a local issue, and discussed "state-imposed limits on municipal powers to tax or spend" (McCabe, 1997, p. 1; McCabe & Feiock, 2000, p. 2), "measures limiting growth in local property taxes" (Dye & McGuire, 1997, p. 469), "measures that limit the ability of municipalities to tax their residents to pay for local services" (Bradbury, Case, & Mayer, 1998, p. 288), or "measures intended to constrain growth and reduce the size of local governments" (Brown, 1999, p. 29).

Yet, most in this group relied on broader and more inclusive definitions, for instance, "constitutional or statutory constraints on the fiscal powers of government" (Poulson & Kaplan, 1994, p. 117), "attempts to restrict both the size and growth of state and local government" (Shadbegian, 1996, p. 22), "attempts to limit state and local governments' powers to tax and spend" (Alm & Skidmore, 1999, p. 482), "statutory and constitutional limits on state and local government revenues and expenditures" (Skidmore, 1999, p. 77), "fiscal rules that constrain the growth of state revenues or expenditures" (Krol, 2007, p. 432), and "budgetary rules that determine how much taxes and/or expenditures can increase from one year to the next" (Poulson, 2004, p. 3).

Such variety raises a valid question of the definition most suitable for this dissertation. Literature on research methodology offers several useful suggestions. According to Baggini and Fosi, "a definition should not be too narrow, nor should it be too broad, because both instances may lead to erroneous conclusions" (Baggini & Fosi, 2007, pp. 28-29). Copi and Cohen suggested that a valid definition for empirically testable research should be essential, non-circular, not obscure, and positive (Copi & Cohen, 2001, pp. 23-24). In addition to these factors, the workable definition should also reflect the most current state of research on fiscal limits and can be easily operationalized.

If these criteria are applied, then the definition most fitting the above purpose was given by the 1995 ACIR[6] report titled "*Tax and Expenditure Limits on Local Government*". It defines TELs as "statutory and constitutional limitations on local fiscal autonomy" (Mullins & Cox, 1995, p. 2). This definition satisfies all of the criteria listed above, and it gained general acceptance by the research community, and is frequently used as a standard definition in peer-reviewed publications.

1.2. General Characteristics of TELs

Fiscal limits from their inception in the second quarter of the nineteenth century have been imposed on state and, subsequently, on local governments in an effort first to restrict government revenue, and eventually in the twentieth century, to curb government expenditures.

Presently, tax and expenditure limitations on state and local governments can be found in a variety of forms, and designs in 46 states (Waisanen, 2009). TELs vary significantly from one state to another, and specific designs reflect unique fiscal conditions of state, or local governments subjects to constraints, or as Poterba and Rueben noted, "no two states are completely alike" (J. Poterba & Rueben, 1999, p. 9).

Although TELs are jurisdiction-specific, and in some instances historically distinctive[7], they all possess four common characteristics (**Figure 1**). Two characteristics are dichotomous - the locus of application and the mode of adoption. One characteristic is multi-dimensional – the function of the limitation, and the last characteristic is continuous – the degree of stringency. Following sections will describe these characteristics in more detail.

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[6] Advisory Commission on Intergovernmental Relations
[7] For example, Proposition 2 ½ in Massachusetts.

Figure 1 - Formal Characteristics of Tax and Expenditure Limitations
(Figure created by author)
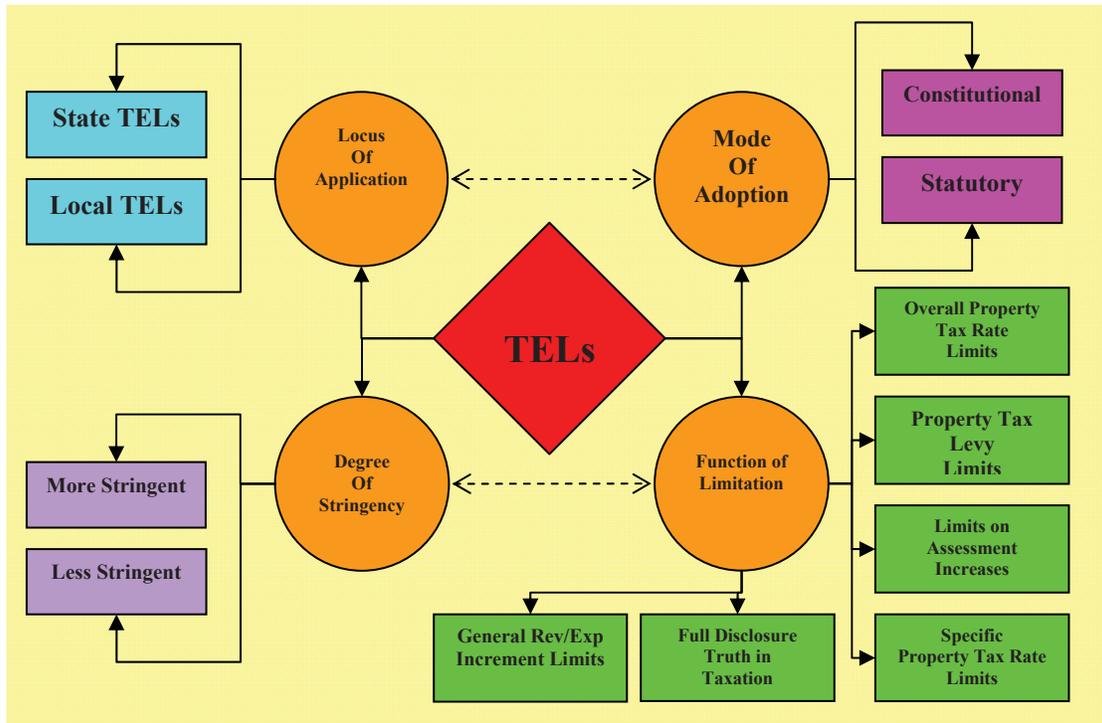
The first characteristic of tax and expenditure limits is the locus of their application (**Figure 1**). TELs can be either state (**Appendix A**) or local (**Appendix B**) depending on which jurisdiction limitations they are imposed.

State limits constrain state budgets, and often serve as an integral part of a larger framework of fiscal rules. The latter typically include balanced budget regulations, debt issuance restrictions, and supermajority requirements (Uhimchuk, 1980).

State TELs may constrain (**Figure 2**) revenues (5 instances), expenditures (23 instances), revenues and expenditures at the same time (Colorado), appropriations (Delaware, Iowa, Mississippi, Rhode Island), or expenditures and appropriations at the same time (Oklahoma)[8].

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[8] As of 2009.

Figure 2 - State TELs by Function of Limitation
(Map created by author)
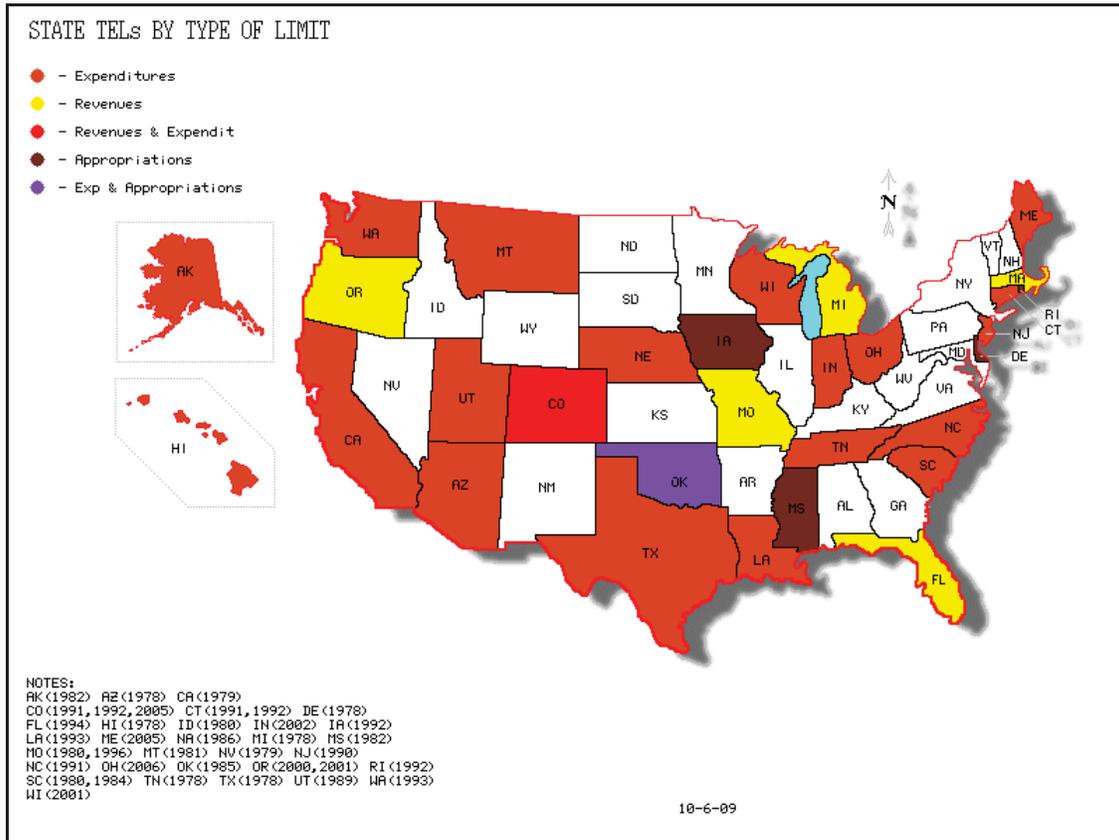
Local limits may constrain county, municipal, and school district budgets. They are imposed by states on their constituent local governments. Local TELs should be viewed within a context of state regulation of local finances. States usually limit the capacity of local governments to raise revenues and issue debt. The former typically exists in the form of local revenue limits.

States can impose limits of various types on all three kinds of local governments across the board. For example, Arizona, Illinois, Kentucky and South Carolina constrain counties, municipalities, and school districts at the same time, but with different kinds of limitations. Delaware and Hawaii limit only counties. Mississippi, North Carolina, Tennessee and Virginia limit counties, and municipalities, but not school districts. Wisconsin limits counties and school districts, but not municipalities. Many states limit municipalities only, either because of the design of local TELs (Alaska), or because counties are too weak fiscally as it is the case of Massachusetts or Rhode Island.

The oldest active TEL of any kind is 1875 Missouri limit on the growth in the local property tax rates. However, it been amended several times. The other two oldest surviving TELs are local property tax limits adopted by Arkansas in 1883 and New York in 1894 respectively.
As of 2009 the youngest state limit is Maine's statutory spending limit conditioning state expenditure growth upon a 10 year average of personal income growth. The youngest local limit

is Washington's 2001 property tax limit on school districts (Deller & Stallmann, 2006, pp. 543-547).

The most common type of state TEL typically "restricts the growth rate of general fund expenditures or revenues to the growth rate of personal income, or to the growth rate of population and inflation" (J. Poterba & Rueben, 1999, p. 9). On the local level specific property tax rate limits are the most common. General revenue limits are characteristically rare and in place only in four states[9] (Deller & Stallmann, 2006, pp. 540-543; Mullins & Cox, 1995, p. 5).

The second characteristic of TELs is the mode of adoption (**Figure 1**). TELs can be either constitutional or statutory (**Figure 3**)[10]. Statutory TELs are adopted and modified by legislative action alone, and, as such, they merely represent new statutes. In comparison, constitutional TELs represent additions, insertions, or amendments into state constitutions. Constitutional TELs require considerable effort to pass, but they tend to be much more stable measures. Uhimchuk explains in this regard that "all American state constitutions have some sort of provision for amending the constitution," and further points out that "there are differences among the states as to the methods of constitutional change that are allowable" (Uhimchuk, 1980, p. 64).

Figure 3 - State TELs by Method and Year of Adoption
(Map created by author)

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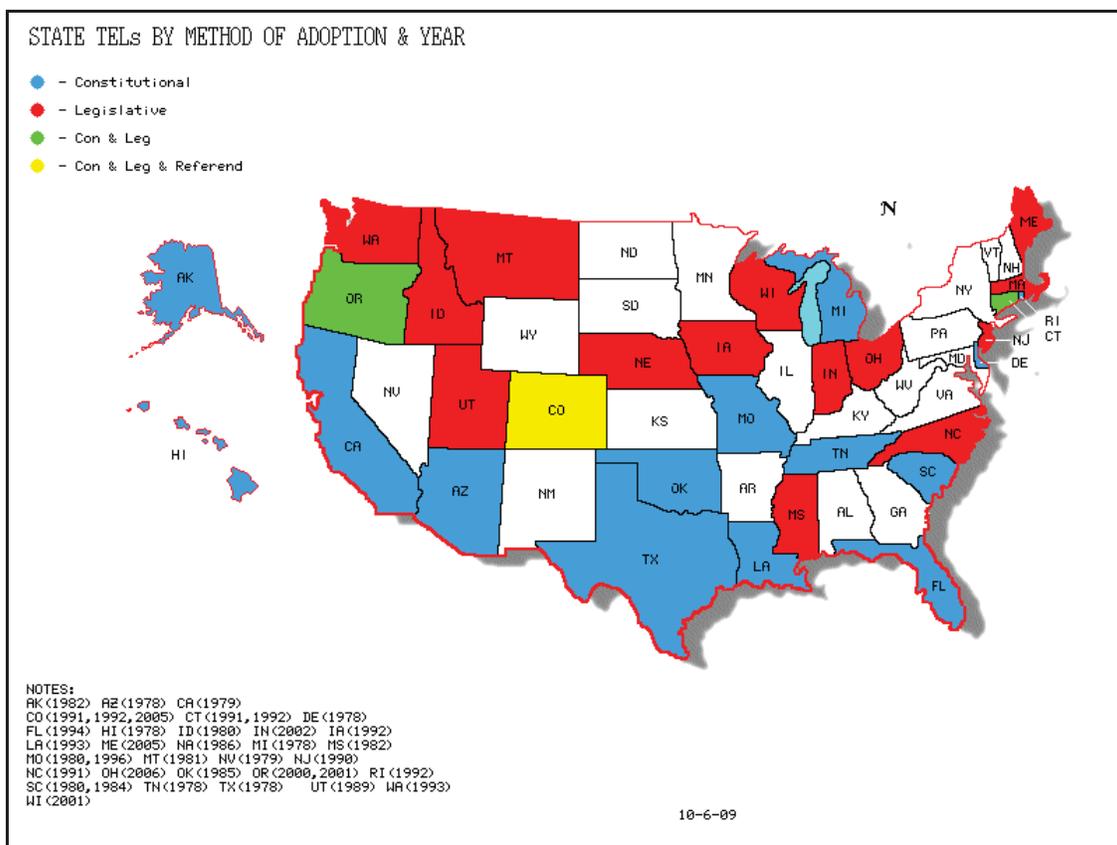
[9] California, Colorado, Minnesota and Nevada

[10] Some authors single out up to 4 modes of TELs adoption – legislature, referendum, initiative, and mixed (Ellis, 2002; J. Matsusaka, 1995; J. Matsusaka, 2000, 2005; Poulson, 2004; D. Smith, 1998; Stankiewicz, 2005).

Currently, there are four methods (**Figure 4**) for passing constitutional TELs: 1) by legislative proposal only (7 states); 2) by either legislative proposal or convention (27 states); 3) by either legislative proposal and/or by initiative (2 states); 4) by convention, or legislative proposal, and/or initiative (14 states).

Figure 4 - Methods of Passing Constitutional TELs
(Map created by author)
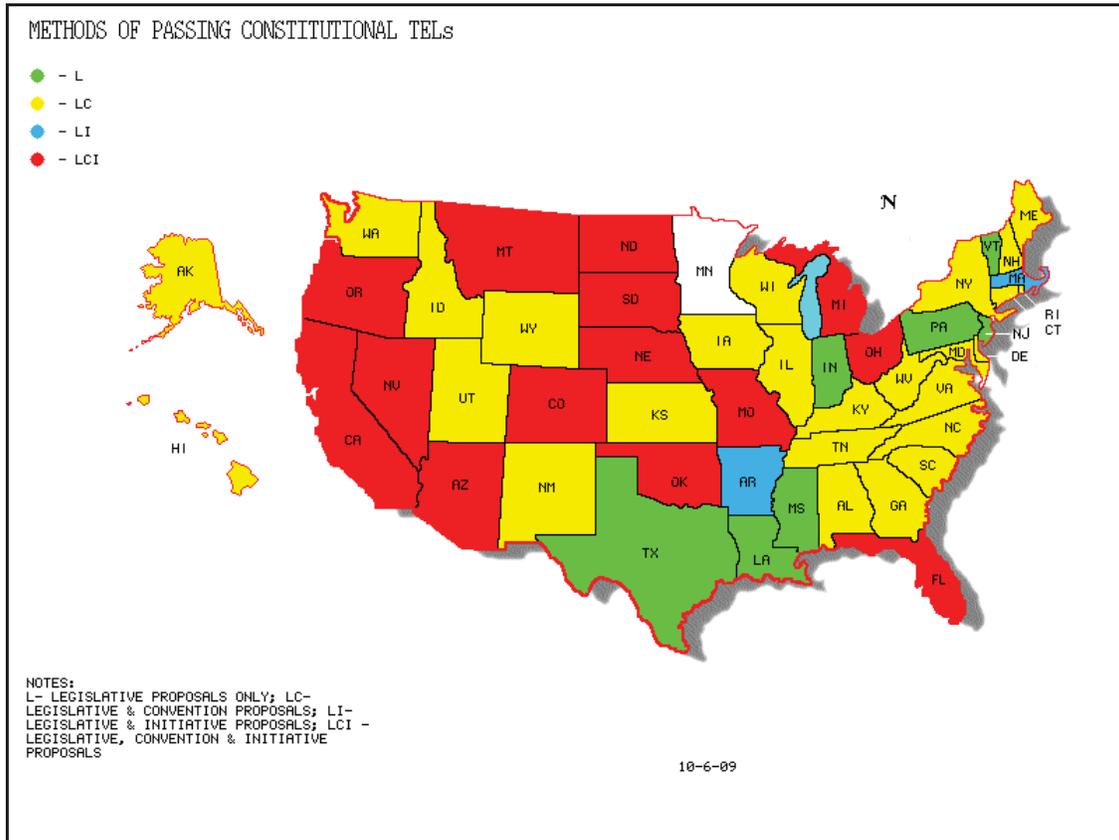
Furthermore, out of 16 states where the initiative option is available, in 8 states constitutional TELs can be imposed directly by voting in a referendum, in the remaining 8 states voters can resort to TELs initiatives in conjunction with legislative action (J. Poterba & Rueben, 1999, p. 12). Voter initiatives often start as grassroots efforts and evolve into populous movements[11]. The state of California has the most favorable climate to initiatives due to the provisions of its state Constitution. The situation with referenda on TELs is more nuanced, and prone to agenda control by legislatures as they are ultimately responsible for the formulation of referenda questions (A. Denzau, Mackay, & Weaver, 1979; Romer & Rosenthal, 1978).

The critical difference between constitutional and statutory TELs is underlined by the fact that "statutory limits can be more easily modified or rescinded by legislatures in times of fiscal or economic emergencies" (Deller & Stallmann, 2006, p. 501), while constitutional TELs cannot be. According to Fino, voters resort to constitutional TELs when, "1) legislatures seem to be

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[11] For example, detailed accounts of one such popular movement – passage of Proposition 13 in California can be found in (Jarvis & Pack, 1979), in (Kaufman & Rosen, 1981) and in (Martin, 2008).

incapable of considering "the future costs of present decisions to incur debt, 2) legislatures are unwilling to reform a system of taxation that places an unfair burden on the taxpayers, and 3) government programs are wasteful and inefficient" (Fino, 2003, p. 596). In this view, "constitutional limitations tend to be strict and mechanical, because of the fact that they are not the products of normal politics, but added as drastic cures to bring state government back to financial health" (Fino, 2003, p. 597).

Some authors suggested that the existence of constitutional TELs can be attributed to public's inability to control the fiscal behavior of the legislature by traditional voting (Daw, 2001). Thus, constitutional TELs are more restrictive because they are much more difficult to remove or circumvent by legislative action, "no matter how dated the provision" (Sterk & Goldman, 1991, p. 1304).

The third characteristic of TELs is the function of the limit (**Figure 1**). There are six functional types of limitations (**Appendix C**). *Overall Property Tax Rate Limitations* typically establish a maximum that prevents further increase in overall property tax rate without explicit approval of voters. These limits are "the most common form of TELs but they can be circumvented through alterations in assessment practices" (Deller & Stallmann, 2006, p. 539).

Specific Property Tax Rate Limitations target specific units of local government, such as municipalities, counties, or school districts, or sometimes, narrowly defined service areas. These limitations can be circumvented as a whole, if assessment practices are altered (Daw, 2001; O'Sullivan, Sexton, & Sheffrin, 1994), or in case of specific services limits, through interfund transfers (Bunch, 2000; Hendrick, Yonghong, & Jacob, 2007; Petersen, 1999; Tyer, 1989).

Property Tax Levy Limits establish a finite amount of revenue that can be raised through the property tax, irrespectively of the property tax rate, but can be increased annually by a certain percentage point. This is the second most common type of TELs (Mullins & Cox, 1995, p. iii). Some research shows that this type of limit is one the toughest for governments to get around due to its fixed nature. However, governments may deploy revenue diversification programs to counter its restrictions (Brown, 1999; Carr, 2006; J. Poterba, 1994; C. Reid, 1988; White, 1979).

General Revenue or Expenditure Increases Limits restrict the amount by which budget revenues and/or expenditures can increase in the following fiscal year. These increases as a rule are derivative of locale's rate of population change, and the rate of inflation, but they are the least common form of TELs.

Limits on Assessment Increases constrain the rate at which the assessed value of properties can be increased. They effectively limit property tax collections because they depend on assessed property values coupled with the tax rate. These limitations can be bypassed by governments in the absence of active property tax rate limits[12] by simply increasing the property tax rate.

The last functional type is *Full Disclosure – Truth in Taxation* requires "public discussions and/or specific legislative vote prior to enactment of new tax rates or levy increases" (Deller &

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[12] Either overall or specific.

Stallmann, 2006, p. 540). This constraint merely informs taxpayers, and, as a rule, requires a simple majority vote of the local legislature, should it deem necessary to raise taxes.

Finally, the last formal characteristic of TELs is degree of stringency: limits can be more or less restrictive (**Figure 1**). Constitutional TELs tend to be much more restrictive than statutory. The least restrictive functional type of TELs is Full Disclosure - Truth in Taxation provisions. The mechanisms of restrictiveness vary. For example, Colorado's Taxpayer Bill of Rights (TABOR) is more restrictive than other constitutional TELs, because it is based on inflation and overall population growth rather than increase at the rate of personal income growth, and also, because it ignores natural growth that can occur in specific state expenditure programs. The degree of stringency of specific functional types of TELs also varies considerably, and depends on specific provisions and designs of limitations.

1.3. Typologies and Classifications

Existing diversity of fiscal limits posed a classification challenge. Early attempts to classify TELs relied on relatively simple categories and reflected somewhat limited scope of research at the time. For example, Lucier distinguished between only two types of limitations, "a tax reduction-service reduction", and "a tax spending restraint" (Lucier, 1979, p. 372). Ellickson relied on similar binary approach, and classified TELs into those aimed at "1) cutting back existing levels of government expenditure and taxation; and 2) restricting their future growth" (Ellickson, 1979, pp. 4-5).

Danziger and Ring viewed TELs as a part of larger institutions of fiscal control, and classified TELs into three broad categories, "constraints on the level of spending, limits on revenues, and regulation of the fiscal policy-making process" (J. Danziger & Ring, 1982, p. 47). Merriman first treated TELs as fiscal instruments placing limits on the ability of local government to "1) collect property taxes, 2) collect non-property taxes, and 3) make expenditures" (Merriman, 1983, p. 43); but later concluded that TELs can be reduced to either "limitations on local governments to make expenditures or collect taxes" (Merriman, 1986, p. 86).

Some authors attempted to develop typologies by building upon functional characteristics of TELs. For instance, Lowery categorized TELs as either general, which are "supposed to reduce a bloated government"; or specific, which are "explicitly designed to reduce reliance on a particular tax" (D. Lowery, 1983, pp. 247-248).

Others relied on either locus of application or the mode of adoption of TELs as the basis for developing a practically useful typology. For example, Kim classified limits into two categories, "1) the level of government at which they are applied, and 2) explicit targets of limitations". Kim explained that such typoligization logically followed from three fundamental differences among TELs: the target of a constraint, the incidence of a constraint and the degree of TELs uniformity (K. Kim, 1992, pp. 10-12).

Terrell delineated two basic varieties of TELs - "1) local revenue containment initiatives passed to restrict the rate at which local governments could tax particular funding sources, and 2) the

initiatives aimed at curtailing the growth of state government linking expenditure and/or revenue growth to growth rates of various economic or demographic variables" (Terrell, 1993, p. 2).

Such imprecise and difficult to use typologies were due to the design of empirical studies on TELs at the time, which "lumped TELs together as a single homogeneous fiscal constraint without reference to their actual diversity" (Poulson, 2004, p. 2). The renewed interest to TELs in the 1990s required developing a typology, which allowed accounting for the wide range of fiscal limits without compromising the robustness of empirical research on fiscal behavior of state and local governments.

Such comprehensive classification[13] has been developed by Mullins and Cox in the 1995 ACIR report (Mullins & Cox, 1995). The authors classified TELs as "designed ostensibly to: 1) control and reduce property taxes, 2) control the growth of government and public spending, and 3) improve fiscal accountability" (Mullins & Cox, 1995, p. iii). This typology stresses functional characteristics of limitations, and contains six basic types of TELs[14] imposed on local government: 1) overall property tax limits, 2) specific property tax rate limits, 3) property tax levy limits, 4) limits on general revenue or expenditure increases, 5) limits on assessment increases, and 6) full disclosure/truth-in-taxation requirements.

Observed variation in the degree of stringency of TELs later prompted Mullins and Joyce to refine the 1995 typology by adding a criterion of severity of constraint. In particular, they argued that since some limitations are more controlling than others, "limitations can be classified based upon the potential constraint that they imply as a function of not only a physical ceiling, but also public sentiment," and sub-divided the six types of TELs into either non-binding TELs or potentially binding TELs (Mullins & Joyce, 1996, p. 76).

In its present form the Mullins-Cox-Joyce typology implies two supertypes: 1) limitations on state finances or state TELs (STELs), and 2) limitations on local finances or local TELs (LTELs)[15]. In turn, each supertype includes relevant types of TELs described above. Compared to other classifications, Mullins-Cox-Joyce typology is more comprehensive, parsimonious, and efficient. These factors make it more functional for both descriptive purposes and empirical research. In view of this, the dissertation will use the Mullins-Joyce-Cox typology.

1.4. Inventory of Currently Active TELs

This section describes geographic distribution and the overall number of currently active tax and expenditure limitations on the state and local governments. Currently, there are 53 active state TELs in 33 states. 35 ($\approx$ 69%) of them are constitutional and 16 ($\approx$ 31%) statutory. Seventeen ($\approx$ 33%) state TELs were approved by legislatures, 17 ($\approx$ 33%) by initiatives, 15 ($\approx$ 29%) by referenda, and 2 ($\approx$ 5%) by constitutional conventions. Twenty five ($\approx$ 49%) state TELs restrict

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[13] And the only to-date

[14] Described in more detail in section 1.2 of this chapter.

[15] Local governments are created and regulated by states as a legal matter, the local budget options are specified by state governments. When it comes to TELs as the instruments of fiscal control, "state governments have taken a particularly active role in the regulation of local governments' spending and taxing authority" (Terrell, 1993, p. 76)

state government revenues, 27 (≈ 53%) restrict state expenditures, 50 (≈ 98%) state TELs limit growth in states finances.

Some state TELs may have multiple targets. For instance, Colorado's TABOR restricts both state revenues and expenditures[16]. A number of state constitutional limits are quite stringent. For example, the 1978 Delaware TEL limits actual appropriations to 98% of submitted revenue estimate. Oklahoma in 1985 adopted 2 constitutional limits restricting expenditure to 12% of annual inflation-adjusted growth and appropriations to 95% of revenues. Rhode Island's constitutional amendment of 1992 limits state appropriations to 98% of projected revenue. 14 out of 16 (≈ 88%) of state statutory TELs restrict government spending. Massachusetts' statutory TEL restricts state revenues to the three-year average growth in state wages and salaries[17]. Iowa statutorily limits appropriations to 99% of the adjusted revenue estimate. Mississippi statutorily limits appropriations to 98% of projected revenue.

State TELs are unequally distributed among the regions (**Figure 5**). Most states with state TELs are Western - 13 (≈ 39%). They account for 22 (≈ 42%) instances of state TELs. Eight Southern states (≈ 24%) impose 16 (≈ 30%) of state TELs. Seven (≈ 21%) Northeastern states approved 9 (≈ 17%) state TELs. In the Midwest 5 (≈ 15%) states have 6 (≈ 11%) state TELs.

Figure 5 - State TELs by Region
(Map created by author)
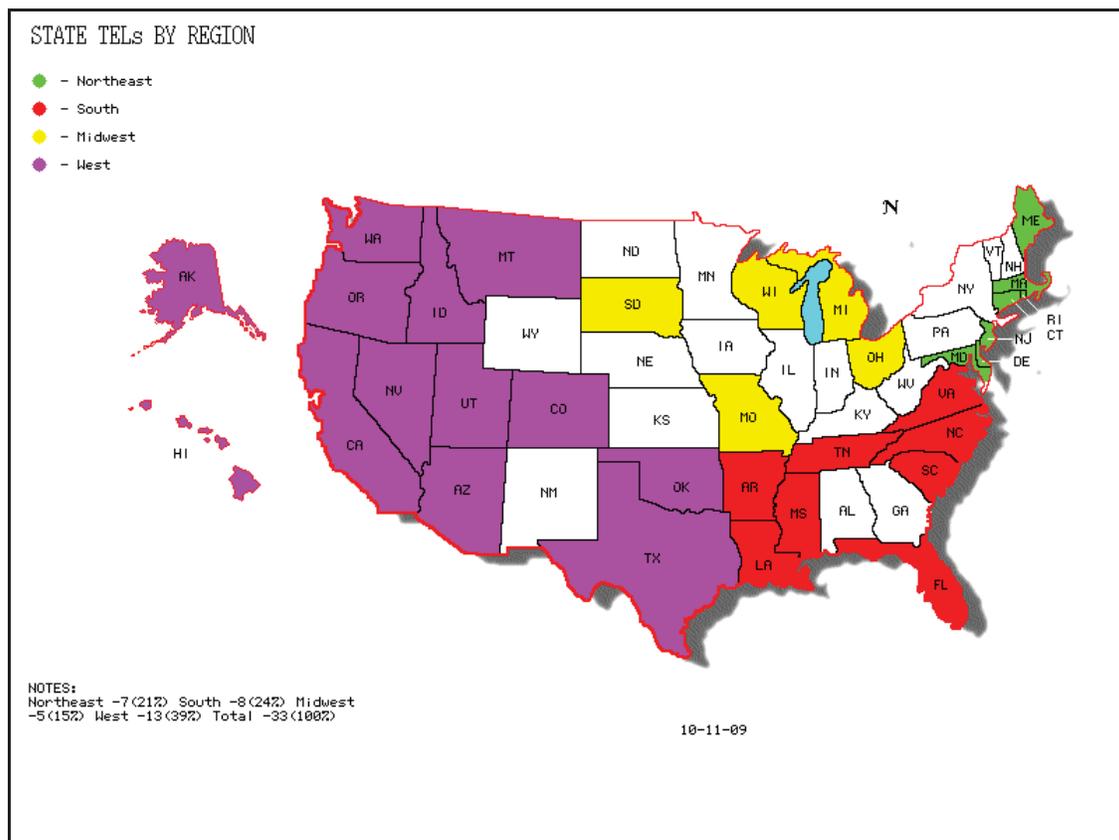
On the local level, 46 states impose 171 limitations on subordinate local governments (**Figure 6**).

Most frequently states constrain all three kinds of local governments at the same time, i.e. in 71 cases (≈ 42%) limitations are imposed on county, municipal governments, and school districts concurrently.

Figure 6 - Local TELs by Target
(Figure created by author)
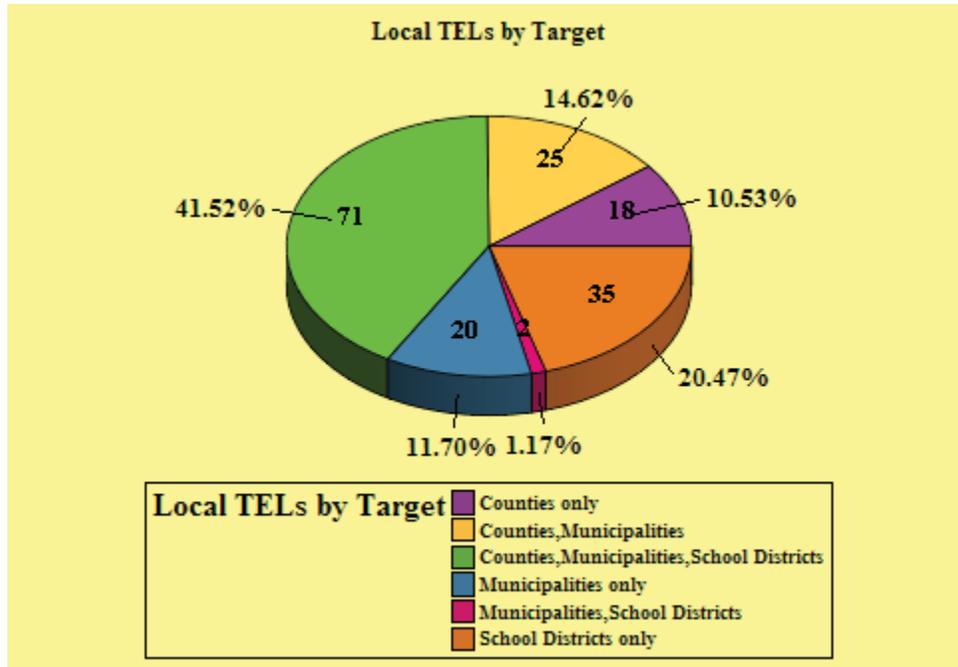
In 25 cases (≈ 15%) county and municipal governments operate under some form constraint at the same time, while school districts remain unconstrained. In only 2 cases (≈ 1%) fiscal limits are imposed simultaneously on both municipal governments and school districts, while county governments remain unconstrained.

School districts by far remain the target of most frequently imposed single constraint – 35 instances (≈ 20%), municipal governments only are constrained in 20 instances (≈ 12%), and county governments only are constrained in 18 instances (≈ 10%).

Figure 7 - Local TELs by Region
(Map created by author)
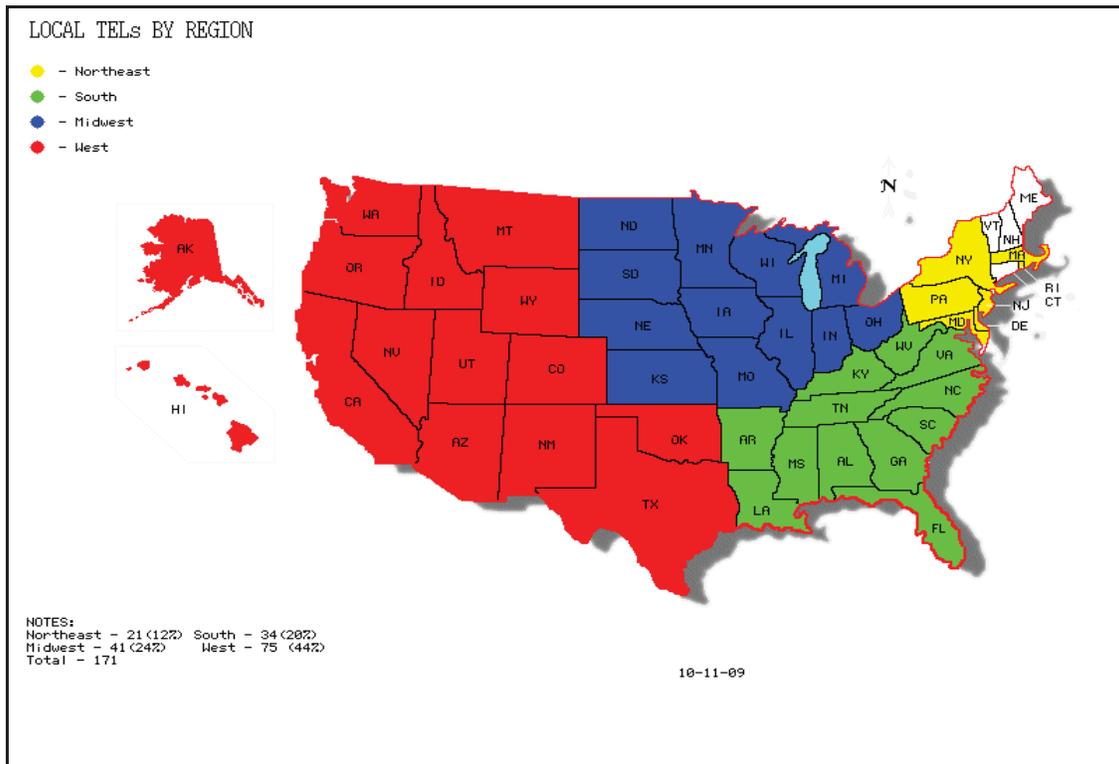
Regional distribution of local TELs is also uneven (**Figure 7**). The largest number - 75 (≈ 44%) is in the Western states, which are trailed by the Midwest - 41 (≈ 24%). Southern states have imposed 34 (≈ 20%) local TELs, while Northeastern states have 21 (≈ 12%) local TELs.

Incidence of local TELs by functional type is illustrated in **Figure 8**. Local TELs most frequently limit specific property tax rate – 59 instances (≈ 35%), property tax revenue limit is the second most frequent – 37 cases (≈ 22%).

General expenditure limits constitute ≈ 13% of all cases with 22 cases. Overall property tax rate limits, assessment increase limits and full disclosure/truth-in-taxation limits occur with roughly the same frequency with 17 (≈ 10%), 16 (≈ 9%) and 16 (≈ 9%) instances respectively.

The least frequent local TEL is general revenue limits and it is imposed in 4 cases (≈ 2 %).

Figure 8 - Local TELs by Functional Type
(Figure created by author)
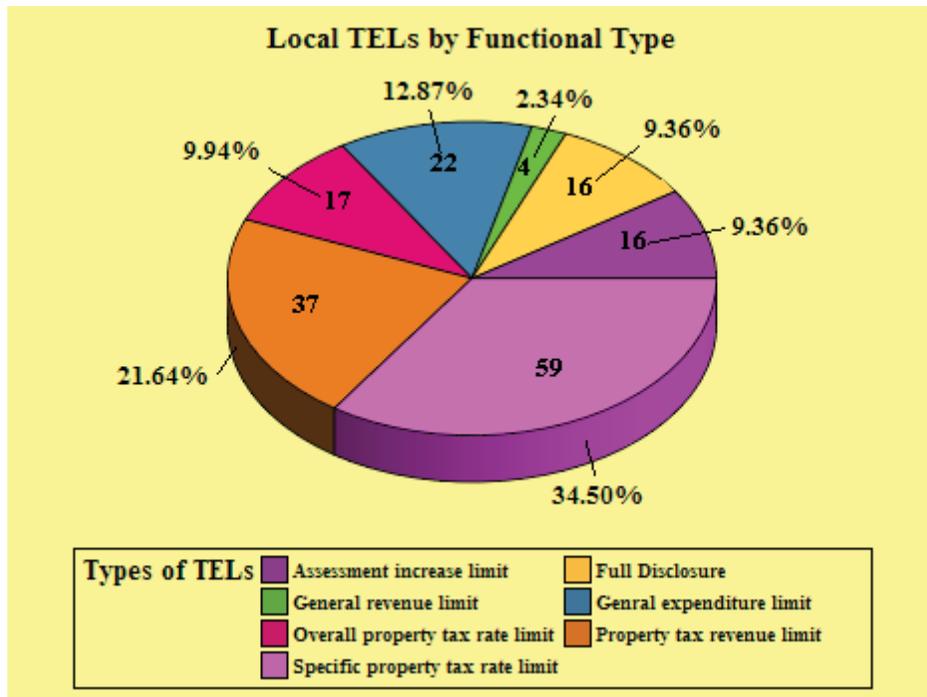
This chapter has presented the extant research on the formal aspects of tax and expenditure limitations, and covered the questions of definition, general characteristics, classification, and the inventory of current fiscal limits.

The most widely accepted definition of TELs defines them as statutory and constitutional limitations on local fiscal autonomy. Most reliable and generally accepted typology of TELs classifies limits into 6 basic types by function of constraint and the degree of their stringency.

All TELs can be generally characterized depending on the locus of their application as either state or local, based on the mode of adoption as either constitutional or statutory, and by the degree of stringency as either more or less stringent (binding and non-binding in the basic typology).

Tax and expenditure limitations target various levels and types of governments. TELs may restrict revenues, expenditures, appropriations separately or concurrently. Local special and general purpose governments are the most frequent subjects of various types and forms of constraints. The empirical study of this dissertation will rely on the definition and the typology of TELs described above.

CHAPTER 2. A BRIEF HISTORY OF FISCAL LIMITATIONS

This chapter presents a historical evolution of tax and expenditure limitations. It has three objectives: first, to identify chronological patterns of past tax and expenditure limitations; second, to investigate causal relationships between prevailing socio-economic conditions and the presence of fiscal limits; and, finally, to investigate probable reasons behind persistent popularity of fiscal constraints among generations of voters. The last objective will link this and the subsequent chapter, in which the theory of fiscal constraints on government and voter support for TELs will be discussed in more detail.

In this chapter a broader term "fiscal constraints" will be used instead of the more period-specific "tax and expenditure limitations". Such substitution is necessary because the term "tax and expenditure limitations", strictly speaking, refers to the last wave of fiscal limits and, therefore, it would be incorrect to label all previous occurrences of limits as TELs. The focus of this chapter is on general trends rather than individual cases. Only those dates and facts are explicitly mentioned that have been confirmed through cross-references of the original sources or library research.

2.1. Constraints on the Federal Fiscal Authority

The history of fiscal constraints in the United States goes back into the 18th century and arguably starts with the republic itself. Since 1800 Fiscal constraints have been imposed multiple times, and almost exclusively on state and local governments. In comparison, the federal fiscal powers were gradually expanded, first by then Secretary of the Treasury Alexander Hamilton, who introduced excise tax on whiskey in 1791[18]; then, subsequently, by president Thomas Jefferson, who repealed internal taxes, but relied instead the tariffs and land sales (J. Reid, 1979, pp. 71-72); and finally by the Sixteenth Amendment in 1913, which greatly expanded the authority of the Congress to levy an income tax[19]. However, the limits on the federal fiscal powers do exist, and in order to have a complete picture of fiscal constraints, they need to be briefly discussed.

In the early days of the American Republic, the fiscal powers of the federal government were very weak. The unfortunate experiences of the American colonists with the British Royal Boards of Taxes and Stamps had laid a solid foundation for the general dislike of taxes which arguably persists to this day. The Founding Fathers were aware of dangers to liberty posed by the coersive powers of state, and attempted to limit them.

The Articles of Conferederation can be regarded as the first but failed attempt to achieve this goal as there was no mention of taxes or tariffs in the Articles. Uhimchuk in this regard explains that "the constraint on the federal government's taxing power was merely implicit in the Articles of Confederation, since the Continental Congress was not granted any means of coercing the states to make payments" (Uhimchuk, 1980, p. 28). As an alternative explanation, Beard

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[18] The immediate cause of the Whiskey Rebellion of 1794

[19] "The Congress shall have power to lay and collect taxes on incomes, from whatever source derived, without apportionment among the several States, and without regard to any census or enumeration" (Rakowe, 2003).

attributed the failure to the inability of the Congress to deal adequately with the free-rider problem in the aftermath of the revolutionary tax revolt (Beard, 2004, pp. 19-52).

The second attempt in constraining federal fiscal authority was more successful. The US Constitution had delineated the taxing powers of the federal government and individual states. In particular, Section Eight of Article One states that taxes "shall be uniform throughout the United States" (Rakowe, 2003, p. 395); and, therefore, it limits fiscal choices available to the federal government.

Some scholars (Brownlee, 2004; Cooley, 1998; Glendon, 1991; Lo, 1990) went further, and argued that the tax limiting powers of the US Constitution are not exhausted with the Section Eight of Article One only, and asserted that the Fourteenth Amendment's reference to "due process of law" could be interpreted as an indirect tax limit preventing excessive tax assessment by the federal government.

Such broad understanding of the Fourteenth Amendment remains contentious, however, and has been challenged repeatedly in the courts (Beard, 2004). Uhimchuk points to a "considerable controversy concerning due process clause and its relation to taxation" (Uhimchuk, 1980, p. 30), and cites several Supreme Court rulings on the matter either upholding[20] or rejecting[21] such fiscally-bound interpretation. Apart from the constraints imposed by the US Constitution on the federal government, citizens from the early days of the republic used their voting power to restrict the taxing powers of the states and localities.

In the last two hundred years fiscal limitations not only have been a recurrent theme in the socio-political discourse, they have gradually become one of the staple features of state fiscal policies. Fiscal constraints have been evolving and mutating with the ebb and flow of the US economy constantly reflecting ever changing balance between the expenditure demands of the electorate and revenue capacities of individual levels of government. They often morphed from one form into another, and, despite somewhat limited fiscal effectiveness,[22] fiscal constraints have managed to deceive the powerful forces of extinction.

Available historical data make it possible to distinguish four large waves of fiscal constraints between 1800 and 2008 (**Figure 9**), each caused by specific economic conditions of the time:

1) the internal improvements period limits (1832-1870);

2) the limits of the Gilded Age (1870-1917);

3) the limits of the Great Depression era (1929-1945), and;

4) the latest tax and expenditure limitations movement (1970-to present).

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[20] E.g.: Blackstone vs. Miller (1903);
[21] E.g.: Safe Deposit and Trust Co. vs. Virginia (1929), Farmer's Loan & Trust Co. vs. Minnesota (1930);
[22] See section 4.1 of Chapter 4.

Figure 9 - Periodization of Fiscal Constraints (1800 - 2000)
(Figure created by author)
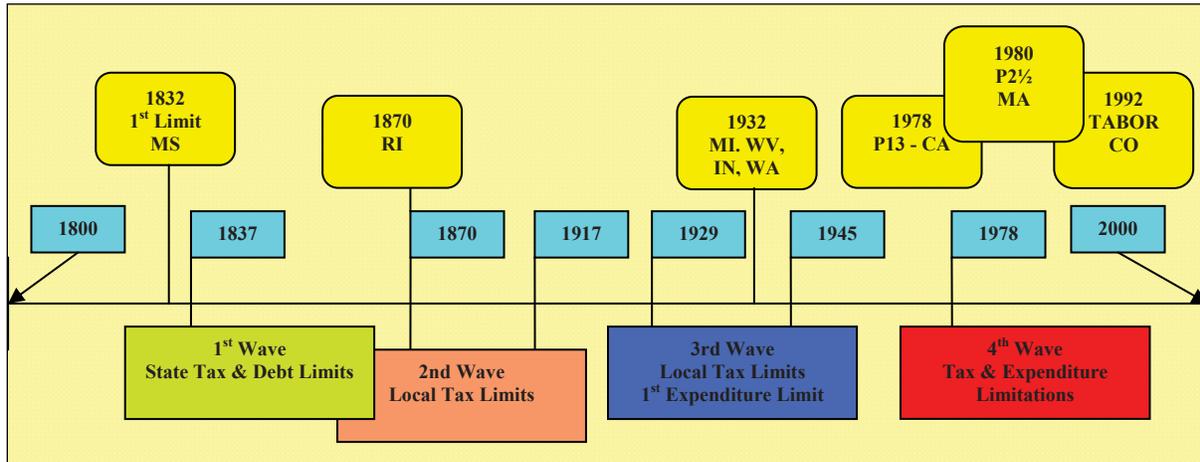
From the standpoint of fiscal history, first decades of the fledging republic were uneventful. In the post-revolutionary era there was no need to limit fiscal powers of state and local governments because they were relatively weak. Twelve of the original colonies relied solely on land tax as a source of government revenue (Merriman, 1987, p. 14). In addition to land tax Delaware had a very primitive sales tax. The responsibilities of state and local governments were very narrow, the budgets were miniscule, and little revenue was required. However, by mid-1830s the situation with state and local finances started changing rapidly, which coincided with the accession of new members to the union, gradual growth of population, and significant growth of commerce.

2.2. The Limits of the Internal Improvements Period

The first wave of fiscal constraints was associated with the financial panic of 1837. This wave targeted state finances only, and was caused by the so-called Internal Improvements. Internal improvements were government investments in various infrastructure projects. Goodrich explains that "for many decades state and localities have engaged in extensive programs for the promotion of economic development by the support of works of internal improvement" (Goodrich, 1950, p. 145).

These state sponsored development programs were often driven by the westward expansion. As Fino points out, "the opening of the West was the most important economic event of the first half of the 19th century, and the construction of canals, bridges, roads and railroads was necessary to capitalize on trade with the developing West" (Fino, 2003, p. 961).

States recognized the importance of interstate commerce with the newly opened territories, and used whatever land tax revenues they had to finance various internal improvements, which were supposed to facilitate free market exchange. For example, New York was the first state to embark on such program by constructing the Erie Canal in 1825 (Baer, 1993). The canal became somewhat of a success story of the time, widely popularized by the unavoidable press

sensationalism, and "inaugurated mania for internal improvements as states competed with each other to capture the lucrative trade of the rapidly developing West" (Fino, 2003, p. 962).

In spite of obvious economic benefits, internal improvements programs had one major negative side effect. In the process of financing capital projects states had accumulated significant amounts of debt, which they hoped to cover with current and future tax revenues. Widespread indebtedness of state governments was often coupled with concomitant failure of internal improvement projects to generate profits sufficient enough to cover even operational costs associated with maintenance of recently constructed infrastructure. Dire straits of the state finances shattered investors' confidence, precipitated the financial panic of 1837, and eventually contributed to the "universal reaction of revulsion against improvements, and led to significant change in public policy" (Goodrich, 1950, p. 147).

Voters *en mass* started resisting state participation in internal improvements, sought means to rein in runaway state expenses and imposed constitutional limitations on the fiscal powers of state governments. Close examination of even a small random sample of the local newspapers of that period from New York City, Providence, RI and Philadelphia, PA reveals that citizens were obsessively concerned with the situation. Virtually every other newspaper issue contained either an editorial or a reader's letter vociferously condemning state financing of internal improvements. Citizens regarded limits as a harsh but necessary solution for the containment of the costs of government.

In this environment the state of Mississippi was the first state in the union to adopt a tax limit in 1832. Its constitutional constraint placed a ceiling on the ability of state legislature to raise revenues to cover debts associated with the internal improvements. Interestingly, Mississippi voters at the time were particularly outraged by the runaway state expenses associated with the development of two ports - the Vicksburg Harbor on the Mississippi river and the Gulfport on the Gulf of Mexico; but mere 30 years later these two projects were generating a significant portion of the state revenues as riparian and maritime trade quickly picked up (G. Wright, 1978).

It should be noted, however, that as a general rule first tax limits were often combined with simultaneous or subsequent debt limits, which were supposed to act in unison and reduce overall tax burden for tax payers. For instance, just one year after imposing a tax limit, voters in Mississippi added another constitutional provision restricting the overall amount of debt state government could incur each year. The maximum allowable amount under this limitation had not to exceed 5% of the total state revenues collected in the previous fiscal year.

Soon other states followed suit with similar measures, Florida in 1833, Rhode Island in 1834; and by 1852 voters in eleven states approved constitutional tax limitations (Goodrich, 1950, pp. 156-159). Some of these first tax limits were short lived and swiftly abolished by the state legislatures or state courts, while others, despite some amendments, survived for a long time, for example, the state of North Carolina's 1834 tax and debt limit stayed on the books until 1879, when it has been finally repealed.

Seven out of eleven of the first wave states were southern. Such an anomaly poses a question about such popularity of tax limits in the South. Some speculated that voters in the ante-bellum

southern states strongly disliked state funded projects but did not resist the states' participation in internal improvements per se (Delfino & Gillespie, 2008; G. Wright, 1978). Negative sentiments towards internal improvements had to do mostly with the agrarian economies of the South heavily reliant on the slave and indentured labor. The political agenda and the ballot box below the Mason-Dixon Line were dominated by wealthy slave-holding planters, who regarded internal improvements as attempts to industrialize the South, and eventually erode southern way of life.

Deeply rooted suspicion of change coming from the rapidly industrializing North, and threatening the very foundations of the South had to be countered, and tax and debt limits seemed appropriate tools of resistance. Rich southerners wanted to preserve the existing status quo as long as possible and for the most part were not keen on financing internal improvements, which, in their opinion, were so detrimental to their own economic prosperity[23]. In any case, many of the first tax limits were hastily designed and their effectiveness was viewed as lethargic at best. The initial anti-tax zeal eventually subsided, and a comparatively long period of lull followed. The quiet period lasted for several decades until the later 19th century.

2.3. The Limits of the Gilded Age

The second wave of fiscal constraints arrived in 1870 and lasted with intermittent intensity roughly for four decades. Unlike the first wave, the second targeted finances of local governments, especially local school districts. The states of Rhode Island in 1870, Arkansas in 1883, and Nevada in 1895 successively imposed statutory property tax limitations on their constituent counties, municipalities and school districts. Alabama in 1875 and New York in 1884 were the first states to resort to constitutional limitations, but "in both cases limitations were applied to specified groups of local governments" (ACIR, 1962, p. 28). In 1899 Nevada converted its statutory property tax limit into a constitutional clause with some minor modifications but yet again with limited applicability.

Winkler reports that these constrains "were followed in the early 20th century by Oklahoma (1907) and Ohio (1911), which adopted constitutional amendments limiting the property tax" (Winkler, 1979, p. 330). These two states were the first to insert overall limits into constitutions (ACIR, 1962, p. 29). In 1916 the state of Oregon adopted a 6% limit on the growth of property tax levies (ACIR, 1977, p. 11). After 1916 and until the onset of the Great Depression no other states imposed new fiscal constraints.

In terms of effectiveness, the constraints of the second wave did not fare better than those of the first, despite a change in the locus of limitation. They were generally ineffective. According to the 1962 ACIR report, "the limits that have been established [in this period] do not appear to have restricted actual operations" (ACIR, 1962, p. 28). Based on available government records the report pointed out that "assessed valuations, which aggregated $35 billion in 1902, had

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[23] The domestic tariffs literature offers another intriguing explanation of popularity of tax limits in the South (Edwards, 1970; Irwin & Temin, 2002; Jensen, 2003; Stampp, 1991). It can be argued that the Tariff of 1824, which was designed to protect US industry from cheaper foreign commodities, created a conflict of sectional interests between the North and the South. The southerners saw it as a device that benefited the North at the expense of the South. Thus, they were more willing to support tax and debt limiting measures.

doubled by 1912, almost doubled again in the following decade, and reached a peak of $169 billion in 1930; thus during the first quarter of the 20th century state and local property tax revenue could have quintupled merely on the basis of expansion of taxable assessed valuations; in fact, property tax collections rose six-fold between 1902 and 1927 from $706 million to $4,730 million." The verdict of the report is unequivocally clear, "for the nation as a whole, property tax rates rose during this early period in spite of limitations" (ACIR, 1962, p. 29).

The biggest unresolved question of the second wave is its causes. There is no consensus in the literature on this issue, but at least three quite similar explanations were offered. Some authors (R. Gold, 1975; Posner, 1998; A. Sokolow, 1998) blamed inequitable property assessment practices. Others (G. Fisher, 1996; Mott, 1966; R. Netzer, 1966) believed that the failures of constitutional uniformity provisions could have been responsible for the imposition of new constraints.

It is possible, however, that both unfair property assessment practices and constitutional uniformity provisions contributed to the imposition of constraints. Constitutional uniformity provisions regulated property tax rates. Property assessment practices determine the tax value of property. Property tax levy is a derivative of both property tax rate and the net assessed value of the tax base. Problems can occur either with tax rates, or with the assessment practices, or with both. Corrective measures could have been sought by the voters to address either side of the equation.

Uniformity provisions were constitutional requirements to tax all property at the same rate (**Figure 10**). These clauses in state constitutions were a reaction to state and local tax systems of the post-revolutionary period (Schade, 1938). Those systems were obsolete, and did not reflect the realities of the rapid industrialization and emergence of new groups of taxpayers. They continued relying almost exclusively on property taxes, and were skewed heavily towards revenue maximization at the expense of tax equity (H. Adams, 2005; Brownlee, 2004; Joseph, 2004; Martin, 2008).

The major critical flaws of these tax systems were overreliance on ambiguous rules and discretionary judgment of government officials. Such ambiguity was exploited by powerful groups of taxpayers. Starting with the 1st quarter of the 19th century, special interests lobbied state legislatures to apply differential[24] rates to certain types of property, and "were able to secure exemptions and significant reductions in tax liabilities, while those without such access were subject to higher burdens" (Brunori, Green, Bell, Choi, & Yuan, 2005, pp. 10-11).

In an effort to curb the spread of tax privileges, between 1818 and 1896, voters inserted explicit requirements into constitutions of 33 states to tax all property uniformly based on its value (G. Fisher, 1996, p. 66). Such uniformity was short-lived, however.

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[24] Usually considerably lower

Figure 10 - XIXth Century Tax Uniformity Provisions
(Map created by author)
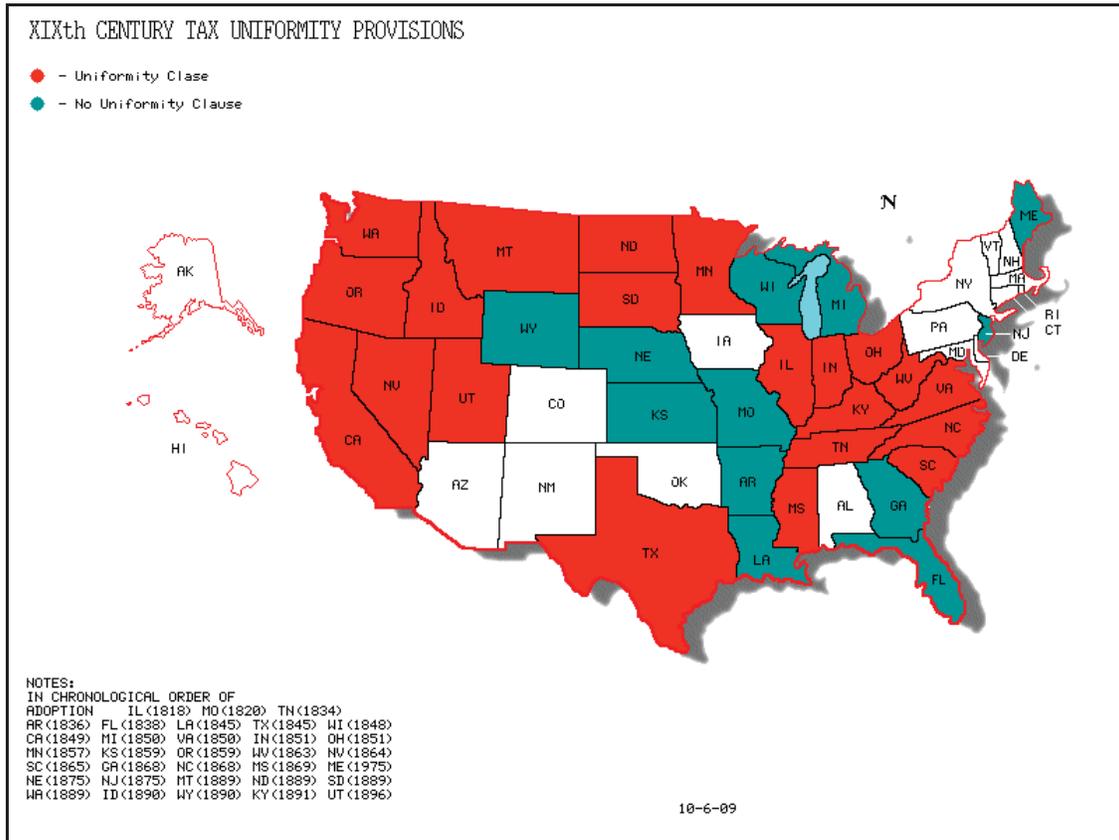
According to Brunori *et al,* "uniformity was never achieved, no state taxed all tangible and real property evenly, though many state constitutions required just that; and as the 19th century progressed, most states amended their constitutions to allow exemptions" (Brunori, Green, Bell, Choi, & Yuan, 2005, p. 13).

As more and more exemptions were approved, the property tax collections declined. In order to maintain the yield of the property tax at least on the same level as before the exemptions, governments started to manipulate the assessed value of taxable property, for example, in Ohio (R. Atkinson, 1923, pp. 11-13).

Governments either assessed the value of all property upwards across the board, or they assessed certain types of properties as having much higher tax value compared to other types. In the same manner as the constitutional uniformity provisions have been busted by special interests, private interest groups cajoled local governments into assessing certain classes of properties[25] as having lower tax value by the virtue of assessment exemptions or special assessment rules.

The only difference in this case was that such concessions have been much cheaper to exhort. The fiscal result of it was that powerful taxpayers effectively lowered their tax burden, while less

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[25] Usually agricultural land or industrial sites

connected or financially less fortunate property owners continued facing escalating tax bills as governments overtaxed remaining properties not subject to special assessment rules (Hill-House & Welch, 1937). Under these circumstances, large numbers of taxpayers were willing to support statutory property tax limitations.

A third, more nuanced explanation (Fisher, 1987; D. Netzer, 1991) of the causes incorporates the other two, but stresses the demise of the general property tax as the main culprit. After the revolutionary war local governments levied uniform general property tax on all property[26] and each taxpayer paid for the government services proportionately to his wealth (Joseph, 2004). By the end of the 19th century this system has been eroded by private interests, and that led to the imposition of constraints.

According to Fisher, private interests exploited two weaknesses of the system. One had to do with the failures of uniformity provisions to address adequately the emerging differences between property as a legal term and wealth as an economic concept. Since in the old agriculture-based rural economy wealth and property typically coincided, the ownership of property correlated with income, and it was easy for local governments to levy property taxes based on such apparent ability to pay.

In contrast, in the new commerce-based and increasingly urbanized economy ownership and wealth were defined by property rights conveyed by various financial and legal instruments. Links between wealth and property became harder to establish. Local property tax administrators often lacked the legal authority, competence, and resources needed to assess, and collect taxes on ever more sophisticated systems of property ownership.

Another weakness had to do with reluctance of local assessors to value property at full value. Assessors were elected officials, and, thus there existed a direct connection between assessed value of property, resulting tax bill, and the security of assessor's job.

In addition to that, increasing ranks of wage-earners and professionals were eroding property tax base. These taxpayers had significant incomes but typically owned little or no property. They negated the very logic of property ownership as a suitable measure of ability to pay. As Brunori *et al* point out, "the state general property tax presented almost insurmountable enforcement problems; no state was able to reach even a small percentage of the total personal property in its jurisdiction; only a small fraction of such property was ever subject to tax and the primary administrative problem was that citizens became adept at hiding personal property to avoid tax liabilities" (Brunori, Green, Bell, Choi, & Yuan, 2005, p. 14).

The situation was aggravated by state legislatures passing new exemptions to constitutional uniformity provisions that excluded hard to assess properties. By 1870s property tax base had shrunk considerably. In this unhealthy fiscal environment many states in order to compensate for narrowing of the tax base allowed local governments to collect property taxes at higher rates. As Brunori *et al* explain, "while administratively necessary, the narrowing of the property tax base prompted critics to complain that it now burdened certain types of wealth while letting others escape completely" (Brunori, Green, Bell, Choi, & Yuan, 2005, p. 15).

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[26] Real and personal

Dissatisfaction with de facto inequitable distribution of property tax burden prompted voters to support tax limits. As a result, according to Musgrave *et al,* "by the end of the century the general property tax has been supplanted by a much narrower approach, it became a selective tax on real estate and business personalty[27] and so remained ever since" (Musgrave & Musgrave, 1989, pp. 464-465).

Now, irrespectively of what explanation on the causes is more correct, two conclusions can be drawn. One is that the fiscal constraints of the Gilded Age were most likely caused by the confluence of interrelated factors and not just one precipitating factor. It is also clear why constraints of this period targeted local governments. The latter carried out the dual role of property assessors and tax administrators; therefore, the brunt of fiscal constraints should have been inevitably placed on them.

2.4. The Limits of the Great Depression Era

The third wave of fiscal constraints arrived with the Great Depression. The 1920s were the lull period, and "no new laws of consequence were imposed" (Haygood, 1935, p. 28). The matters took a different turn shortly after the stock market crash of 1929, and by 1933, "13 states imposed new or tightened existing statutory or constitutional restrictions on the power of local governments to levy property taxes" (Merriman, 1987, p. 21).

The driving forces behind this flourish of fiscal containment activity are reminiscent of the second wave. Again, it targeted local governments and local property tax, but this time constraints were much more stringent. According to the ACIR report, "unlike the earlier limitation movements, which were intended to stop property taxes from rising, the proposed limitations were set low to force *reductions*[28] in property tax levies; furthermore, there was pressure to place the limitations in constitutions to ensure their perpetuity" (ACIR, 1962, p. 37).

This stringency was a result of rapid decline in property values. As Winkler explains, "property values declined during the Depression but assessed values declined with a lag, resulting in higher effective tax rates; this, combined with declining personal income, resulted in political pressure to limit the property tax" (Winkler, 1979, p. 331).

The 1962 ACIR report describes the situation in the following manner, "property owners began to feel the pinch early in the Depression as property values declined rapidly, and tax delinquency rose sharply during the first three or four years of the Depression; tax assessors eventually took cognizance of the drop in the real estate market, and by 1935 assessed valuations had fallen from their 1930 peak of $169 billion to $135 billion; while property tax revenue, which reached $4.7 in 1927, and probably rose to well above $5 billion by 1929, dropped to $4.5 billion in 1935 before starting to turn upward again in 1936" (ACIR, 1962, p. 29).

Under the circumstances of rapidly depreciating property values, and declining property tax yields, associations of real estate agents lobbied state legislatures and private citizens that

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[27] i.e. equipment and inventory
[28] Sic exemplar

"property was carrying an inordinate share of tax burden" (ACIR, 1962, p. 30). The ultimate objective of these frantic efforts was to insert rigid overall tax limitations into state constitutions. According to the proponents the immediate result of the proposed measures would be significant property tax relief (Thornton & Weise, 2001). For instance, Hill-House and Welch reported that in several states the National Association of Real Estate Boards lobbied for a constitutional amendment limiting the tax levy to 1% of market value with no provision for additional authorization by the electorate (Hill-House & Welch, 1937, pp. 3-4).

The results of political pressure for tax relief did not take too long to appear. In 1932 four states almost simultaneously passed property tax limits. Michigan and West Virginia resorted to constitutional limitations, while Indiana and Washington relied on statutory limits (Morris, 1943). In 1933 Ohio and Oklahoma decreased their overall rate limits, but at the same time, as a preemptive offsetting measure they fortified constitutional limitations adopted earlier (ACIR, 1962, p. 30; Thatcher, 1952, pp. 373-374). In 1936 Nevada extended the applicability of its constitutional tax limit of 1899 effectively to all types of property.

According to Schade, between 1932 and 1936 seven other states passed overall property tax limitations on local governments, and all of them targeted the property tax rate (Schade, 1938). Mott reported that this wave of fiscal constraints continued way into the early 1940s (Mott, 1966). For instance, in 1944 the state of Washington took example of Nevada, and changed its statutory limitation of 1932 into a constitutional one. Winkler also noted that some of fiscal constraints of the third wave affected education; for example, New Mexico in 1933 adopted a constitutional amendment imposing an "aggregate 20-mill tax limit on assessed value for educational purposes" (Winkler, 1979, p. 331).

The victory of the proponents of tax relief was only partial as the stringency of constitutional limits has been eventually compromised as it happened earlier. Contrary to the original propositions to prohibit future increases in property tax levies, none of the adopted constitutional limits contained such a provision, except in Nevada, which had "no provision for levies outside the limit" (ACIR, 1962, p. 30).

According to Merriman, "by the mid-1930s voters were increasingly skeptical of tax limitation laws" (Merriman, 1987, p. 22), and the anti-tax activity generally declined. Besides overall property tax rate limitations, during the same period a number of states attempted to constrain specific functions of state and especially local governments. This can be considered as the beginning of expenditure limits. According to ACIR report, "this type of control, in some cases, served to avoid enacting overall limits and, in other cases to set limits on expenditures for new functions of local government" (ACIR, 1977, p. 12).

Compared to the second wave, the Great Depression limits had one new characteristic: reliance on voter initiatives to pass fiscal constraints. By 1945 out of 14 states with active limits 10 states[29] have constrained fiscal choices of state and local governments through the use of voter initiatives, a form of direct democracy (**Figure 11**). Matsusaka explains that "voter initiative is distinct from other direct democracy devices in that it allows citizens to *propose* laws" (J. Matsusaka, 2000, p. 623). The use of voter initiatives has its roots in the Progressive Movement,

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[29] Mostly Western

and "the first state to adopt initiatives was South Dakota in 1898 and Los Angeles was the first city in 1900; and by the middle of the 20th century, there were 19 initiative states and 29 non-initiative states" (J. Matsusaka, 2000, pp. 624-625).

Figure 11 - Initiative States and Year Initiative Clause Adopted
(Map created by author)
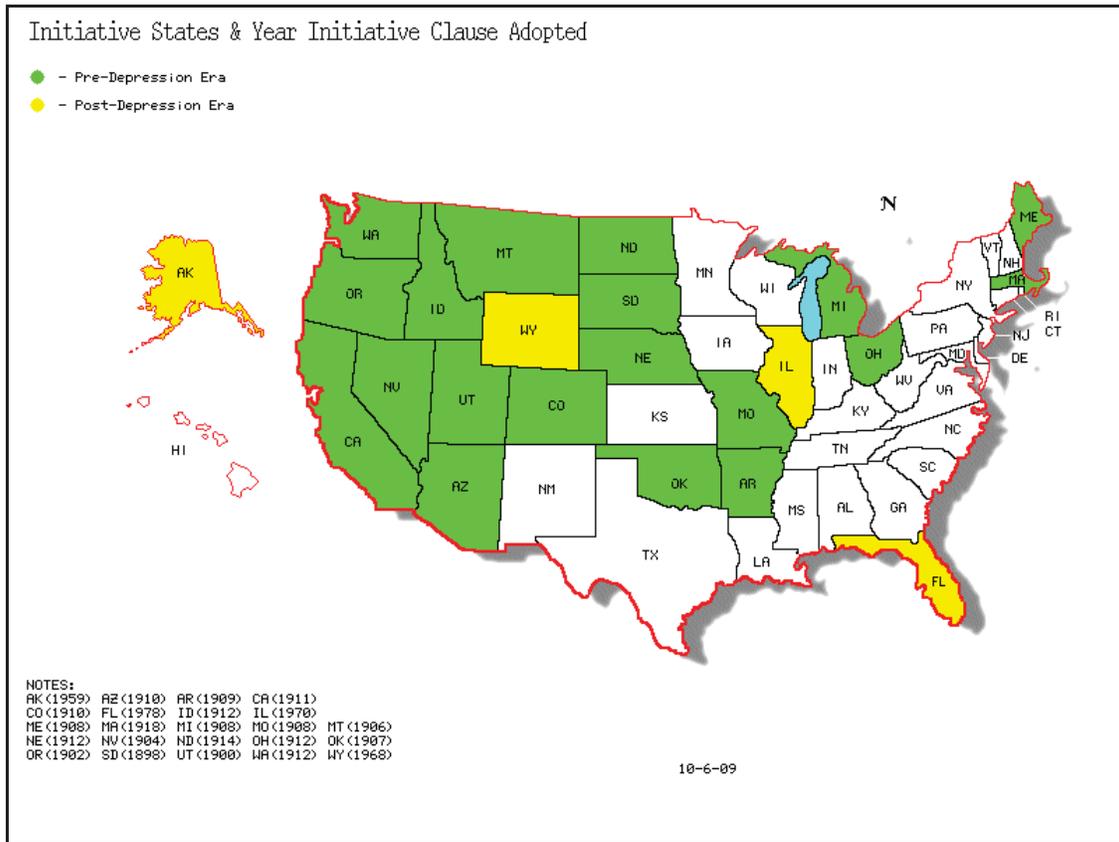
Zax in turn indicated that "the purpose of these reforms was to bring typical legislative practice into conformity with the republican ideal," and further pointed out that "initiatives were one of the mechanisms by which legislative work could be revised, and direct legislation would reduce the influence of some special interests" (Zax, 1989, p. 268). This explains why states with voter initiatives dominated the list of states with fiscal constraints. The main conduit here is the relatively low responsiveness of state and local governments in the 2nd quarter of the 20th century (Beito, 1989; Ellis, 2002).

During the Great Depression voters have become more fiscally conservative than their representatives, but fiscal policies were not aligned with the preferences of the taxpayers. The taxpayers were suffering as a result of drastically worsened economic climate, and could not sustain any longer the property tax burdens appropriate for more prosperous times. The administrative lag in the adjustment of property values has exacerbated the problem even further as rapidly declining incomes could not have kept pace with the stagnant property tax levies. State representatives were slow to respond to increased push for lower tax burden, and voters resorted

to the means of fiscal containment. In the states where voter initiatives were in place, it has been much easier to do.

Taken as a whole, from the standpoint of government efficiency, fiscal constraints of the Great Depression era can be regarded as a positive development. As the 1977 ACIR report underlines, "limits provided an incentive for improved property tax administration, by encouraging uniform, full value assessment – to get the maximum yield from the tax" (ACIR, 1977, p. 12).

Nonetheless, administrative usefulness of the limits should not eclipse the "real story" of the third wave, namely the obvious fact that the drive for property tax relief spurred the adoption of new tax limits in the 1930s, not considerations of government efficiency. In this regard, Hill-House and Welch commented that "the overall limitation movement is well designed to accomplish one end – reduction in real estate taxes; and all of its other objectives are professed in order to give it wider public appeal" (Hill-House & Welch, 1937, p. 31).

2.5. The Tax and Expenditure Limitations Movement

The fourth wave of fiscal constraints started in the early 1970s and continues to-date (**Appendix D**). Very much like the earlier waves, limiting activity was preceded by a relatively long period of no action. According to Merriman, "between the end of the Great Depression and the early 1970s, few new, stringent TELs were enacted, and localities had learned to live with the older ones" (Merriman, 1987, pp. 23, 25). Thus, the fourth wave can be regarded as a logical continuation of the earlier limiting efforts; but this wave has at least four unique characteristics.

First, prior to the 1970s fiscal limitations were typically caused by specific economic conditions of the day. In contrast, the newest wave has been precipitated to a large extent by ineffectiveness of the older measures gradually eroded by adverse court rulings and frequent legislative actions.

The second difference is the much larger scale of popular involvement in the fiscal limitation process, especially in the Western states with voter initiatives.

The third difference is the extent of the of containment effort. Never before, have so many governments been operating under so many various types of limitations. For example, according to Sokolow, the volume of activity in 1970-1995 was considerable both in number of states taking action and in number of separate limitations adopted[30]; and the peak activity took place in 1978-1981 immediately after California's Proposition 13 (A. Sokolow, 1998). Only five states[31] in this period liberalized their restrictions, and abandoned previously existing tax rate limitations for less severe full disclosure requirements (Mullins & Cox, 1995). For this reason the latest wave of constraints is typically referred to in the public finance literature as the tax and expenditure limitations movement.

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[30] 42 states adopted 68 different measures during 1970-1995.
[31] Hawaii, Minnesota, South Carolina, Tennessee and Virginia

Finally, the severity of imposed limitations clearly stands out. In many instances the finances of both state and local governments have been constrained simultaneously often with both overall revenue and spending levels limits.

Since the erosion of the old limits played such pivotal role in the renewed interest in fiscal limits, the behavior of state and local governments and courts on the cusp of the fourth wave needs to be described in more detail. According to ACIR report, "although no new overall property tax limitations have been enacted since 1930s, there has been considerable legislative and judicial action; even the states with constitutional limitations have found it possible to ease them, in some instances court decisions have had this effect" (ACIR, 1962, p. 31).

The impact of judicial decisions on the effectiveness of older constraints was equally detrimental. For instance, the Michigan Supreme Court on two occasions[32] ruled against statewide tax rate limits. In the same manner, the Oklahoma Supreme Court decided in 1960 that tax levies intended for debt service should not be subject to overall tax limit (Uhimchuk, 1980, pp. 283-287).

At the same time, local governments in states with active constitutional constraints pushed through amendments effectively easing the impact of limits. For example, in 1955 and in 1960 Oklahoma passed two amendments circumventing its 1933 constitutional tax limit and allowed additional levies for educational expenses. In 1958 West Virginia approved an amendment permitting school rates beyond the constitutionally imposed limits. In 1962 Alabama voters sanctioned an additional school levy contrary to direct constitutional ban (ACIR, 1962, p. 31). In the states with statutory constraints "numerous laws have been passed which have been aimed at mitigating more stringent limitations enacted earlier" (ACIR, 1962, p. 32). Enactment of new laws undermining statutory limitations, and creating special taxing authorities by the early 1970s led to considerable growth in the number of special districts further complicating local fiscal relations.

It is against such fiscal backdrop, between 1970 and 1976 thirteen states and the District of Columbia have enacted new limitations. These jurisdictions not only have chosen to add new limits, they have also invented new types of them. As Shannon *et al* explained, "all of the 14 jurisdictions enacting new controls since 1970 have avoided the traditional rate limit approach" (Shannon, Bell, & Fisher, 1976, p. 276).

Instead, they resorted to levy limits. In this period 7 states[33] passed laws limiting annual growth of property tax levies. These laws were further bolstered by explicit voter approval requirements for all instances of levy increases. 3 states[34] had experimented with various kinds of levy limitations prior to 1970.

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[32] In *School District of Pontiac v. City of Pontiac* (1933) and *School District Number 9 v. Washtenaw County Board of Supervisors* (1954);

[33] Kansas (1970), California (1972), Minnesota (1972), Wisconsin (1973), Indiana (1974), Washington (1974), Iowa (1976);

[34] Colorado (1968), Arizona (1969), Oregon (1969);

Thus, by 1976 ten states were de facto limiting growth of property tax levies. In this period four states[35] and the District of Columbia introduced the so-called full disclosure/truth-in-taxation laws.

Despite their seemingly innovative touch, the truth-in-taxation laws can be considered essentially as a secondary form of levy limits. As Shannon *et al* explained, "the distinction between the levy limits and the full-disclosure laws is the method provided for exceeding the limit; the voters must usually approve any property tax levy greater than allowed by the limit, in truth in taxation laws the final judgment to exceed the established millage rests with the governing body of local representatives" (Shannon, Bell, & Fisher, 1976, p. 283). These developments suggest that from the early 1970s legislatures have been actively experimenting with state tax systems, sometimes moving in two directions simultaneously: altering the old limits and imposing new ones.

These legislative processes were abruptly interrupted by more activist citizen involvement in government fiscal affairs on June 6, 1978, when Californians approved Proposition 13. It was placed on the ballot by a coalition of policy entrepreneurs[36] led by local conservative politicians Howard Jarvis and Paul Gann; marketed as *People's Initiative to Limit Property Taxation*, and was portrayed in the media as a major grassroots effort. The wording and the fiscal essence of the proposition have been demonstratively populist (Gayk, 1982; Rose, 1982).

Proposition 13 was approved by 65.3% of voters; and established an acquisition value system of property assessment. Despite numerous legal challenges, the California Supreme Court ruled favorably on the constitutionality of Proposition 13[37] in the same year, and so did the U.S. Supreme Court in 1992 in an almost unanimous 8-1 decision[38].

The passage of Proposition 13 manifested the collapse of traditional approaches to financing state and local government services in the US on the one hand, and on the other hand, announced a completely new era of fiscal populism. Kirlin and Chapman noted that "the passage of Proposition 13 directly impacted the financial activities of the public sector in California; fiscal interrelationships between the state government and units of local government within the state, and even interrelationships among those local units were dramatically changed" (Kirlin & Chapman, 1979, p. 269).

The sequence of events preceding the passage of Proposition 13 provides incisive clues about driving forces behind increased popular involvement in fiscal matters of government so typical of the fourth wave of fiscal constraints. In 1966 a major corruption assessors' scandal undermined California voters' confidence in the fairness of property assessment practices (Bow, 1966, pp. 305-308). In the aftermath of the sandal the state legislature swiftly responded with a reform bill AB №80, which required keeping all assessments at a uniform percentage of market value of property. In the subsequent years, the values of real estate grew up and so did the property assessments (Brazer, 1981; Sonenblum, 1973).

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[35] Florida (1974), Montana (1974), Hawaii (1976), Virginia (1976), the District of Columbia (1975);
[36] More on the role of policy entrepreneurs in section 3.3 Chapter 3.
[37] In *Amador Valley Joint Union High School District v. State Board of Equalization (1978)*;

[38] *Nordlinger v. Hahn (1992)*;

By 1978 California's homeowners perceived property tax bills as excessive, and grew resolute to take drastic measures against increasing tax burden. Oakland characterized California fiscal climate before Proposition 13 as having following elements: "1) a heavy and growing local and state tax burden during a period when such burdens have leveled off in most other states; 2) a massive shift of property taxes towards homeowners; and 3) a rapidly expanding state budget surplus" (Oakland, 1979, p. 388).

Responding to such unusual fiscal climate, irritated Californians decided to circumvent the normal legislative process more appropriate for tackling fiscal matters. The ramifications of 487 words inserted by them into the California Constitution were felt both in the state and nationwide.

]In California, Proposition 13 limited fiscal choices of _all_ governments. This never ever happened before in the entire fiscal history of the United States. It was achieved through four fiscal limitations: "1) no real property can be taxed at more than 1% of its 1975/6 assessed value; 2) this assessed value can increase no more than 2% per year, unless the property changes ownership at which time it is reassessed at current market value; 3) a local government cannot increase an existing tax or impose a new tax without the approval of two-thirds of the qualified electors; 4) the state government cannot impose a new tax without approval from two-thirds of the membership in each house of the State Legislature" (J. Danziger, 1980, p. 605).

Nationwide Proposition 13 ushered a new tax and expenditure limitations movement by creating a precedent, which a number of states promptly copied. Mikesell summing the consequences of Proposition 13, stated that its adoption, "and related referenda in other states had a substantial impact on state and local government finance" (J. Mikesell, 1986, p. 5).

The list of converts to the popular revivalist fervor of fiscal constraints is extensive. One of them is the state of Massachusetts with Proposition 2½ approved on November 4, 1980. In passing this proposition voters clearly followed the lead of Californians. The measure severely restricted the ability of municipalities to raise tax revenue for local public services. Under it, "cities and towns with high tax rates required to reduce property tax levies by at least 15 per cent per year until they reach the maximum allowable rate of 2½ per cent; communities with tax rates below that level were allowed to raise property taxes but by no more than 2½ per cent per year" (Ladd & Wilson, 1982, p. 121). Hence is the Proposition's name.

What is interesting about Proposition 2½ is the objective of the voters. Unlike in California, where voters had specific targets,[39] and acted in a basically crude way; the intentions of voters in Massachusetts have been much more clearly articulated and less dogmatic. According to Ladd and Wilson out of 6 most frequently cited explanations[40] for voter support for Proposition 2½, "views toward inefficiency and waste in government were the most important". Furthermore, they have concluded that "the vote for Proposition 2½ was much more an attempt to obtain lower taxes and more efficient government than to reduce the level of public services" (Ladd & Wilson, 1982, p. 138).

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[39] assessment practices and excessive tax burden
[40] Service levels, inefficiency and waste, spending and taxes, tax shift, relative fiscal status, public sector job status;

The Massachusetts case is actually one of multitude. According to Mikesell, in the first 5 years after Proposition 13 there were 43 instances of statewide fiscal referenda, but as he points out, "clones of Proposition 13 have been remarkably unsuccessful since 1978; such referenda have failed three times in Oregon, twice in Michigan and Nevada, and once in Arizona, South Dakota and Utah; only voters in Idaho in 1978 and Massachusetts in 1980 have approved a package generally comparable to it" (J. Mikesell, 1986, p. 7).

In the last 25 years the intensity of the fourth wave of fiscal constraints had only increased. While some states have adopted new limitations, other states increased the restrictiveness of existing limitations, for example, Colorado.

According to Martell and Teske, it "has the most restrictive TEL in the nation, encapsulated in a 1992 amendment to the state constitution known as the Taxpayer Bill of Rights (TABOR)" (Martell & Teske, 2007, p. 673). In this case again, a policy entrepreneur played a pivotal role in introducing the constraint, because "the TABOR Amendment was a result of initiative crafted by a single individual Douglas Bruce" (James & Wallis, 2004, p. 22).[41]

The TABOR constitutional amendment is applied to both state and local governments, and mandates that any tax increase leading to the increase of governmental revenues at a rate faster than the combined rate of population increase and inflation as measured by either the cost of living index at the state level, or growth in property values at the local level; would be subjected to a popular vote in a referendum[42].

Moreover, TABOR also requires that any natural growth in revenues that exceeded this rate has to be either earmarked for educational spending or rebated to the taxpayers. According to Barrett *et al,* "from 1998 to 2003, the state of Colorado refunded more than $3.2 billion in Tabor surpluses" (Barrett, Grene, & Mariani, 2003, p. 4). The state of Colorado is an outlier, however. It needs to be mentioned that a number of states[43] took a recursive approach by constantly revising the existing limits.

Apart from the issues discussed above, it would not be an exaggeration to note that the tax and expenditure limitations movement opened up an entirely new research agenda for the field of public finance. As a major fiscal phenomenon TELs confronted the field with the need to conceptualize them, develop a comprehensive theory of fiscal limits that would offer reliable models of government behavior under fiscal constraints, and explain the reasons for persistent voter support for such measures.

In addition, the important questions of TELs overall effectiveness, their effects on taxation equity, structural characteristics of state and local public finances and on local governance required urgent attention of investigators. The findings of the research of the last thirty years on these pertinent issues will be presented in the subsequent two chapters.

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[41] What is most astonishing is the fact that Douglas Bruce "had moved to Colorado from California, where he had been a foot soldier in that state's tax revolt" (James & Wallis, 2004, p. 22).

[42] This process is commonly referred to in Colorado as "de-Brucing" after Douglas Bruce.

[43] Nevada, New York, Washington, West Virginia.

In summary of this chapter, several conclusions can be drawn from the history of fiscal limitations.

The first and probably the most important is that tax and expenditure limitations of the present period bear distinct birthmarks of the prior waves of fiscal constraints. Despite some obvious, locally specific issues and circumstances, latest TELs reflect the reiterative nature of the powerful forces of tax resistance and tax revolt, so endemic for the US.

Second, periods of limiting activity usually coincide with the periods of economic problems or crises. Immediate objectives and targets in each specific case or state may be different but the causal link in general is relatively straightforward – the worse the state of the national or state economy, the stronger is the push to fiscally limit the government. Under current economic downturn, it will not be a surprise, if the lax and expenditure limitation movement receives a new powerful boost of popular interest.

Third, the imposition of fiscal constraints is typically caused by and most frequently targets the actions of local governments - the most proximate level of government to taxpayers.

Fourth, until very recently, fiscal constraint measures have been mostly reactive rather than preemptive. This situation has changed considerably in the current period thanks to extensive research conducted by various policy think tanks, which examined prior experiences with fiscal constraints, their ramifications, and often offered concrete suggestions about most effective TELs designs. As a result of this research tax and expenditure limitations of today tend to be more preventative and more binding.

The final conclusion is that the degree of restrictiveness of fiscal constraints has increased over time, and coincided with the trend of design sophistication.

CHAPTER 3. THEORY OF FISCAL CONSTRAINTS ON GOVERNMENT

The art of taxation consists in so plucking the goose as to obtain the largest possible amount of feathers with the smallest possible amount of hissing.
Jean-Baptiste Colbert[44]

The two previous chapters discussed formal aspects of and presented a brief history of tax and expenditure limitations. This chapter explores the substantive side of fiscal limits through the lens of economics and public finance. The main objective of the third chapter is to discuss the most pertinent theoretical issues underpinning fiscal limits.

The discussion will proceed in three steps reflecting major areas of theoretical inquiry on the subject. First, the theory of tax and expenditure limitations will be discussed in the context of two major competing paradigms of public finance – the traditional public finance and the public choice. Second, various interpretations of tax and expenditure limitations offered by dominant models of government will be compared and evaluated.

Finally, past research on voter support for fiscal limits will be reviewed with regards to its relevance to specific models of government.

3.1. General Theories of Fiscal Limits

The question of the fiscal nature of tax and expenditure limitations is inseparable from the concept of limiting government. However, the meaning of this concept is relative, and assumes different connotations depending on specific descriptive theory employed for analysis. Two main competing theories coexist in the public finance literature, the more established conventional and the more recent contrarian (J. Buchanan & Musgrave, 1999, p. 189).

The conventional theory is the traditional or orthodox public finance. In the most general sense, it views government as a positive societal force, which "operates through the revenue and expenditure measures of the public budget" to produce public goods and services in order to satisfy allocation, distribution, and stabilization functions of public policy (Musgrave & Musgrave, 1989, p. 4).

In contrast, the heterodox public choice theory views government as an oppressive monopoly that dominates citizens by maximizing tax revenues. The two theories offer diametrically opposing views on tax and expenditure limitations as a result of different connotations of the concept of limiting government. This stems from the theoretical divergence on at least two important points – the fiscal role of TELs and the evolution of conceptual thinking about TELs as a fiscal phenomenon. The former will be discussed first.

As a starting point both theories assume institutional perspective on fiscal limits and treat them as an integral part of the larger framework of fiscal rules. They depart, however, when it comes to defining the role of TELs as fiscal rules. The public choice school regards TELs as means to

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[44] The French minister of finance under Louis XIV served from 1665 to 1683.

control the size of government. TELs limit the tax base, and effectively shrink fiscal space available for the government growth (Bails, 1982; Maggadino, Toma, & Toma, 1980; Nelson, 1986).

In this regard Brennan and Buchanan noted that tax limitations "are not mere abstract notion, but a general restriction on the use of particular taxes, or in some cases on the size of government," and that the objective of tax limitations is "to constrain government from taking actions that the citizenry predicts governments would or might have taken in the absence of tax limitations" (Brennan & Buchanan, 1979, p. 11).

On the contrary, the orthodox public finance views TELs as means to control the cost of government. In this view TELs do not limit the tax base per se[45], instead they reduce the effective tax burden by introducing various restrictions on the conduct of fiscal administration (Kirlin, 1982, 1997; Merriman, 1987; Musgrave & Musgrave, 1989). For example, Fisher explains that the ultimate intent of limits "can be to reduce the level of government taxes and spending, to impose more political control over changes in taxes and spending, or to alter the mix of government revenue sources, or to alter the relative fiscal roles of state compared to local governments" (R. Fisher, 1996, p. 287). This distinction between the theories on the question of fiscal role of TELs can be further illustrated by how differently they approach the relationship between tax base and fiscal limits.

The traditional public finance rests on the assumption that tax base should be as broad and diversified as possible to guarantee stability and efficiency of tax system (Kaldor, 2003; Musgrave, 1959, 1997; Musgrave & Musgrave, 1989; Musgrave & Peacock, 1967; Pigou, 1975, 2006; Wicksell, 1967).

This is important for two reasons. First, the size of tax base and the excess burden per unit of revenue raised are in inverse relationship. Second, the broadening of tax base generally contributes to more even distribution of tax burden and fairer tax incidence. This in turn tends to enhance tax equity and efficiency so central to the orthodox public finance theory. This is usually a salient premise of many tax reforms that are often designed with the explicit objective to expand the tax base[46] of a specific level of government (Mullins & Pagano, 2005; Roosen, 1997; Shah, 1991; Williams, 1945).

Therefore, in the traditional public finance, tax base is largely a technical issue of fiscal administration. Then, in this environment, the imposition of fiscal limits serves as a clear signal from citizens that government is overgrazing specific segments of its tax base and the mode of administration of that tax base has to be changed.

The public choice school premises its counterargument on the idea that "assigning a particular tax base to government is equivalent to assigning government a monopoly franchise in "sale" of that "tax base". Public choice posits that "aggregate government revenue will increase, when government's collection of monopoly franchises is expanded, i.e. when the tax base is

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[45] Although a number of authors disagree with such reasoning (Faulkner, 1982; Ladd & Bradbury, 1988; J. Poterba & Rueben, 1995; Rose, 1982)

[46] Usually as diversification of revenues

broadened", and conclude that "beyond some point, such increases in aggregate government revenue will be regarded by citizenry as undesirable: levels of public spending will be pushed too high" (Brennan, 1981, p. 136).

In essence, the public choice opposes a default handing over of any tax base to any government without prior explicit consent of the governed in principle. For that reason, tax base for the public choice school is not a trivial issue of fiscal administration left to government bureaucrats to tinker with, but "a matter of fiscal constitution" (Brennan & Buchanan, 1980). Following this logic, the imposition of TELs on government is not a call from citizens for a "new management" of the tax base, but an attempt by citizens to review and reconfigure the entire system of fiscal relations between them and the government *ex post*.

The second major point of theoretical divergence between the competing theories is the evolution of conceptual thinking about fiscal limits. In the orthodox public finance theoretical treatment of limits has gradually evolved out of practical thinking about the upper limits of taxation, fair taxation, and from the research on taxable capacity[47].

This line of thinking is well established and fairly prescriptive. It emerged as a reaction to the factual demands and resultant problems of fiscal administration. On the other hand, conceptual thinking about TELs in the public choice theory is fairly recent, and rests on the notion of fiscal constitution. It attempts to be normative, and borrows heavily from the field of political science. The conceptual development of the fiscal limits in the orthodox public finance will be considered first.

Attempts to define the upper limits of taxation can be found as early as 6th century B.C.E. and span many cultures. For instance, Confucius gives an injunction that "a tenth part of income from a subject is acceptable for a ruler to take, but a fifth share is extreme" (Ames & Rosemont, 1999, p. 173).

The Roman approach to taxation was firmly grounded in the considerations of the ability to pay taxes by citizens. In the republican period the upper level of taxation fluctuated around one per cent. During the Punic Wars this level never exceeded three per cent, which was considered excessive despite the obvious needs of wartime financing (Bartlett, 1994). In the imperial period state profligacy steadily demolished fiscal prudence of the republic, and by the end of the II century, the upper level of taxation jumped to 16 per cent (Fischer, 1996). Even the wealthiest Roman citizens regarded this as oppressive (Hopkins, 1980).

The Bible's First Book of Samuel describes the upper limits of taxation in the following manner, "and he will take the tenth of your seed, and give to his officers and his servants; and he will take the tenth of your sheep: and ye shall be his servants" (I Sam, 8:14-17)[48]. Christianity has infused

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[47] These topics are related but different to the question of optimal taxation. Optimal tax theory seeks to determine the best design of a tax system to avoid economic distortions and inefficiencies (A. Atkinson, 1977; Ramsey, 1927; P. Samuelson, 1986).
[48] Interestingly, even in the biblical times attempts to tax led to tax revolts as the next verse of the book clearly demonstrates, "Nevertheless, the people refused to obey the voice of Samuel; and they said, Nay; but we will have a king over us" (I Sam, 8:19). It is quite obvious that, "the people" said "Nay" to the levels of taxation proposed by Samuel.

religious ethics into practical thinking about the upper limits of taxation, but at a cost of shifting attention from quantification to qualification, making administration of government fiscal affairs more challenging.

In the Middle Ages the question of upper limits of taxation has been restated as a question of just taxation. For example, St. Augustine drew clear distinctions between just taxation and legal plunder. To him taxation was just if it reflected Christian virtues (Augustine, 2003). Aquinas viewed taxation as just only if it came in a form of the fair payment to the sovereign for various services rendered (Aquinas, 1999)[49]. Less inclined to moralize about taxation, pragmatic Machiavelli, nonetheless, warned that "it is necessary to avoid any kind of sumptuous display, with the result that a prince so disposed will consume all his wealth in such activities, and he will al last be compelled to impose a heavy tax burden on the people, and become an extortionist" (Machiavelli, 2003, p. 68).

The evolution of this line of reasoning gained a considerable conceptual momentum in the modern era. Adam Smith approached the question of upper limits of taxation by emphasizing overall fairness of tax systems. He suggested that "every tax ought to be contrived as both to take out and keep out of the pockets of the people as little as possible" (A. Smith, 1991, p. 103).

Lorentz von Stein[50] in his influential *Science of Finance*[51] has updated Smith's principles by adding two conditions, that "taxation must be never to impair capital," and that "taxation should be never so great as to consume income to the point where income looses its ability to create capital" (von Stein, 1967, pp. 32-33).

Applying von Stein's theory, Paul Leroy-Beaulieu[52] has speculated that "taxation is very moderate when the sum of national, provincial and municipal taxes does not exceed five or six per cent of private incomes; taxation is still bearable up to ten or twelve percent of the citizens' income; beyond twelve or thirteen per cent the rate of taxation is exorbitant" (Leroy-Beaulieu, 1967, p. 164). Despite these valuable insights, thinking about upper limits of taxation was not systematic, and lacked applied tools requisite for practical fiscal administration and for meaningful research on public finance.

In the early twentieth century the prevailing thinking among the economists was that the question of upper limits of taxation can be meaningfully answered by developing the concept of taxable capacity. Josiah Stamp[53], who originally proposed the concept, defined taxable capacity as "the difference by the two quantities – the total quantity of production and, the total quantity of consumption" (J. Stamp, 1971, p. 114); approximated taxable capacity of any level of government, and concluded that it is proportionately correlated with public expenditure preferences expressed as a choice for specific levels government services (J. Stamp, 1936).

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[49] Aquinas, however, left to sovereign to decide on the scope and scale of services, thus opening a venue for the abuse of power by oversupply of services.
[50] A German economist and public administration scholar
[51] German Original: Lehrbuch der Finanzwissenschaft; Leipzig, 1885.
[52] A French economist
[53] A British economist and civil servant, expert on taxation

Stamp's achievement in the conceptual development of fiscal limits was that his theory offered a more quantifiable measure of government's ability to raise revenues, because it was based on objective economic indicators rather than subjective ideas about just taxation or its upper limits. Such operationalization significantly improved the conduct of fiscal administration, and offered a sophisticated but reliable tool of fiscal decision and policy making.

The validity of Stamp's theory of fiscal capacity was successfully tested in 1919 during the Paris Peace Conference. The nations-victors advocated imposing heavy reparations on Germany, and intended to use the extracted funds to rebuild their damaged economies[54]. This position was strongly challenged by an obscure functionary of the British Treasury seconded to his country's delegation.

John Maynard Keynes argued that reparations would exceed Germany's total taxable capacity, and, as a result, would quickly ruin the economy due to enormous inflationary pressures. Instead, Keynes advocated a more balanced approach, and using Stamp's methods provided the estimates of Germany's taxable capacity (Keynes, 2006). Unfortunately, Keynes' proposition was not adopted.

Colin Clark,[55] building upon Stamp's and Keynes' ideas (Keynes, 1937, 2000), posited that "25% of the national income is about the limit of taxation in any non-totalitarian community in times of peace" (Clark, 1945, pp. 376-377). Clark also explained how citizens can adjust the taxation levels: if the cumulative taxation levels on all levels of government exceed 25% of the national income, large portions of the voters would be willing to either support a depreciation of the value of the money or the reduction in the level of taxation (Clark, 1945, p. 385).

However, Clark's argument came under attack by Pechman and Mayer who believed that "there is no single immutable limit to taxation" (Pechman & Mayer, 1952, p. 232). Instead, they reasoned that "the revenue system is composed of several different types of taxes, and presumably a critical limit of each tax occurs at a different level," and therefore, "for a tax system as a whole there would not be one breaking point at all times" (Pechman & Mayer, 1952, p. 242).

Despite this critique, Clark's argument about taxable capacity, and the role of the electorate in regulating the upper level of taxation by imposition of tax limits, provided a valuable conceptual foundation for the development of theoretical thinking about fiscal limits in the orthodox public finance. Clark's insights found particularly receptive audience in the US, where tax limits have been a staple feature of state and local public finances at least since the 1830s.

The concept of fiscal limits in the public choice theory has evolved out of its basic premise that the actions of citizens, politicians, and bureaucrats are driven by self-interest. The public choice school proposed a completely new constitutional perspective as an alternative tool of fiscal analysis, and viewed TELs as "a change in the rules of politico-fiscal game" (Brennan &

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[54] Some also argued that the ulterior motivation was the desire to overtax Germany to such extent that she would not be able to regain her dominant economic role on in Europe for the foreseeable future (Myerson, 2004).

[55] Clark's name is usually associated with the concept of Gross National Product.

Buchanan, 1979, p. 11). The public choice theorists strongly criticized the traditional public finance for, in their view, the erroneous notion of the benevolent dictator in which "government is effectively unconstrained beyond its internally imposed pursuit of ethical excellence" (Brennan & Buchanan, 1979, p. 11). Their contention is that in the traditional public finance "any constraint can only be viewed as undesirable restrictions," and that "tax limitation cannot be understood within such a political setting without retreat into the assumption of irrational electoral behavior" (Brennan & Buchanan, 1979, p. 11).

Instead, the public choice school interpreted TELs "as a constitutional affair" (Brennan & Buchanan, 1979, p. 13); because: a) "tax limitation proposals did not emerge out of normal political processes" and, b) "the apparent objective of tax limit exponents was not to secure a once-and-for-all balanced budget reduction". Instead, they argued that "tax limits are explicitly designed to prevent governments from taking actions which, over an indefinite future it is believed they would have taken, electoral constraints notwithstanding" (Brennan & Buchanan, 1979, p. 13).

In the public choice theory "there is a direct relationship between the maximization of [government] income or surplus and maximization of tax revenues," and, as a result, "the central constitutional question for each citizen can now be simply stated: how can each obtain the benefits of public goods supply without exposing himself to gross exploitation by government, exploitation of disastrously excessive tax burdens; one obvious answer to this question is the possibility of tax limitation" (Brennan & Buchanan, 1979, p. 14).

By engaging the constitutional perspective to analyze fiscal limits the public choice school essentially sought to answer the question of "should the power to tax be limited, and if so, then how?" rather than searching for an answer a totally different question, with which the orthodox public finance has been preoccupied, namely, "given a particular revenue requirement, what is the best way to raise it?" (Brennan, 1981, p. 122).

Such switch in the research question implies that particular normative criteria by which specific tax system can be evaluated (fairness, efficiency, administrative costs, etc.) are no longer valid for fiscal analysis, once tax limitations are imposed on government, because "such a procedure does not really provide any means of answering the earlier question concerning the desirability of limits on the government's power to tax," and, most importantly, because "tax limitation is concerned mainly with the magnitude of revenue requirements – a matter with which the tax orthodoxy, armed with its "differential incidence" and "equi-revenue" form of analysis completely sweeps away" (Brennan, 1981, p. 122).

It should be noted that this line of conceptual thinking about tax and expenditure limitations was largely shared by some neo-liberal economists. For example, Friedman in this regard argued that US political and constitutional structure is flawed because citizens have no means to vote on the total budget of government, and stated that "the purpose of tax limitation is to remedy this defect" (Friedman, 1978, p. 16). According to Friedman, TELs signify "a definite movement in public opinion toward greater skepticism of large-scale government programs" (Friedman, 1978, p. 20). Arthur Laffer was similarly enthusiastic about tax limitations, and regarded them as a

surrogate for tax cuts when TELs were difficult to pass for political reasons (Kadlec & Laffer, 1979).

As it follows from the discussion of this section, the theoretical treatment of tax and expenditure limitations as a fiscal phenomenon varies substantially depending on specific schools of public finance. To the public choice school TELs represent the means to control the size of government in the so called post-constitutional period. In the orthodox public finance school TELs are viewed as tools available to taxpayers to control the costs of government when taxation levels reach maximum taxable capacity.

3.2. Models of Government Behavior

The majority of studies of tax and expenditure limitations employ specific models of government as a theoretical foundation for research. Economic theory offers several viable models that can be applied to the theoretical treatment of fiscal limits, each emphasizing either the demand for or the supply of government services.

The most prominent demand-side models are: the median voter model, the Leviathan model, and the Tiebout model. The dominant supply-side models include the bureaucratic budget-maximization and the rent-seeking. The five models offer competing interpretations of tax and expenditure limitations as a phenomenon of public finance. This section will present a comparison of the five models with the objective to evaluate their overall applicability for the analysis of TELs.

3.2.1. The Median Voter Model

The first of the demand-side models, the median voter model[56] is built on the theoretical foundations of Hotelling (Hotelling, 1929), Bowen (Bowen, 1943), Black (Black, 1948, 1998) and Downs (Downs, 1997).

Bowen assumed that public[57] goods are subject to either collective or political rather than individual demand, and applied this idea to the analysis of the role of voting in the allocation of economic resources (Bowen, 1943, p. 27).

Black connected Bowen's insights with Hotelling's principle of minimum differentiation[58], and formulated the median voter theorem proper. Down extended it to the economic analysis of representative democracy, while Bradford and Oates applied it to public policy (Bradford & Oates, 1971).

Since then, the median voter model has been widely used in research on public sector and according to some, it "has served in much the same role as the model of pure competition in the

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[56] Also known as the median voter theorem
[57] Bowen actually calls them "social goods"
[58] Also known as Hotelling's Law, which states that in many markets it is rational for all the producers to make their products as similar as possible (Bannock, Baxter, & Davis, 1994, p. 197)

private sector" (Holcombe, 1989, p. 115). The central actor of the model is the so-called median voter, i.e. one whose voting preferences are exactly in the middle of the distribution.

The basic premise of the model is that the median voter equates his marginal valuation of public service with the tax price under that source (Poulson & Kaplan, 1994, p. 118). The model hypothesizes that voters have single-peaked preferences for a given tax schedule and a single public service, and that they vote non-strategically. Voting preferences can be ordered along a continuum with a resulting distribution reflecting preferred levels of the public service.

Then, in a majority rule elections the local fiscal choice will select such service levels which will defeat all others. Under these conditions, "the preferred level of local services will be the median of the distribution of the demanded quantities; and the mix of government goods and services provided in any community will be the mix and quantity that is demanded by the median voter" (Inman, 1978, pp. 47-48).

Despite its original popularity and a number of positive empirical tests (Holcombe, 1980; Mathis & Zech, 1986; Munley, 1984; Pommerehne & Frey, 1976), the prominence of the median voter model as a research tool has declined in recent years. Several factors contributed to this process: misapplication (Holcombe, 1989), problems with the definition of "median" (Inman, 1978; Turnbull & Mitias, 1995), model's appropriateness only for explaining the aggregate behavior of local governments but not specific services (Turnbull & Djoundorian, 1994); problems with model's applicability to non-local governments (Turnbull & Mitias, 1999), and even to multi-dimensional local issues (Mathis & Zech, 1989).

On top of that, the issue of agenda control substantially undermined the internal validity of the model. Since Romer's and Rosenthal's observation that the voting options in a referendum process can be manipulated by a budget maximizing agenda setter in such a way that voting can result in outcomes inconsistent with the preferences of the median voter (Romer & Rosenthal, 1978, 1979a, 1979b, 1982, 1984), it remains unclear if the genuine median voter's preferences can be revealed without serious distortions within the framework of the model.

Furthermore, some studies have also indicated that the effects of agenda control may stretch beyond "management of outcomes," and can impact the configuration of voting process itself, thus casting further doubts about reliability of the model and its predictive power. In particular, one study demonstrated that in a voting context on multi-dimensional issues an agenda setter can successfully exercise an issue selection strategy effectively preventing any stable majority rule outcome from forming (McKelvey, 1976).

These problems underline significant conceptual difficulties of the model, and raise a legitimate question of the model's robustness. Given the existing problems, how does the median voter model explain tax and expenditure limitations? According to its assumptions, the model treats TELs as preferences of the median voter for specific levels of taxation in case of tax limits, or specific levels of taxation coupled with specific levels of public services in case of tax and spending limits, if both are imposed.

However, a closer examination reveals that such interpretation is problematic for several reasons. First of all, the median voter model describes local choice. By default this excludes TELs imposed on state governments. This in turn significantly narrows the model's scope of applicability leaving a substantial portion of the TELs phenomenon unexplained. The model's explanatory capacity is further eroded by the fact that the majority of local TELs have not been approved locally, but imposed on local governments from above either by state legislatures or by statewide referenda.

Second, even if modified to address the applicability objections, the model still fails to explain the abruptness and the expanding scale of the tax and expenditure limitations movement of the last three decades. Being, at its theoretical core, essentially a linear model, the median voter implies a certain degree of gradualism in the evolution of voting preferences in the absence of major exogenous stress factors. Therefore, one would expect a steady rearrangement of voters' preferences detected in several successive elections. Sudden and large-scale protest votes systematically targeting government finances appear to be generally inconsistent with the model's predictions.

Third, an additional problem arises from the model's postulation that voters do not vote strategically. Some studies demonstrated that voters do so quite frequently either out of self-interest (J. Reid, 1979; Temple, 1996; Vigdor, 2004), or out of ideological predilections (Roch & Rushton, 2008; Thompson & Green, 2004), or most likely out of both at the same time. In view of these findings, it may be probable that voters approving TELs de facto vote strategically, and TELs in fact do not represent the choice of the median voter, because such voting violates the theoretical foundations of the model.

Taking into account these difficulties, it is possible to conclude that in principle, the median voter model can with some success explain local single-issue anti-tax measures, and, therefore, it can be used in research on those measures. For that reason it is not completely irrelevant, but again, it is worth mentioning that the vast majority of TELs votes were on complex, multi-dimensional issues[59]. In addition to that, the issue of agenda control has been frequently and successfully exploited in many TELs votes, and, therefore, it somehow needs to be accounted for by the model, otherwise any interpretation of a TEL within the median voter framework becomes meaningless.

3.2.2. The Leviathan Model

The Leviathan model is another demand side model introduced by Brennan and Buchanan as a direct theoretical response to the tax and expenditure limitations movement (Brennan, 1981; Brennan & Buchanan, 1979, 1980; J. Buchanan, 1991, 1993).

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[59] For example, despite the fact that Colorado's TABOR appeared on the ballot form as a seemingly simple approve or disapprove choice, in reality either outcome was a vote on a complex issue with multiple decision knots. In particular, voters were asked to decide on whether they should get involved (1st knot) through a referendum (2nd knot) each time (3rd knot) when any tax (4th knot) increase (5th knot) resulting in the increase of governmental revenues (6th knot) at a rate faster (7th knot) than the combined rate of population increase and inflation (8th knot) as measured by either the cost of living index at the state level, or growth in property values at the local level (9th knot).

The central tenet of the model is the notion of fiscal constitution. It is defined as a finite set of rules and institutions under which citizens function and cooperate. In such environment, citizens set the constitutional rules by establishing budget parameters and the objectives of fiscal policy, while politicians implement fiscal policy within the framework of predetermined constitutional rules.

In this model government is assumed to act as a tax-maximizing monopolist referred to as Leviathan; which reflects the fundamental assumption that "rational ignorance, fiscal illusion,[60] and outright collusion among elected officials deprive taxpayers of any control they may have over government" (Rowley & Schneider, 2003, p. 356).

The Leviathan model interprets TELs as a reaction by citizens to overreach of the government. In particular, it posits that citizens act in response to the Leviathan's tax-maximizing pressure by imposing constraints on its power to tax so each citizen "can obtain the benefits of public goods supply without exposing himself to gross exploitation by government in the form of disastrously excessive tax burdens and correspondingly excessive levels of public goods" (Brennan & Buchanan, 1979, p. 14).

Due to its theoretical origins and strong complementarity, the Leviathan model has been widely used in the public sector research by the public choice school. How well does the Leviathan model explain fiscal limits? Regardless of its conceptual purposes, interpretation of TELs poses unexpected and surprising difficulties for the model.

One of them has to do with the model's theoretical design. The phenomenon of TELs exposes its considerable functional flaws in the post-constitutional period. The bottleneck here is that in the post-constitutional period "citizens have little control over governmental fiscal outcomes beyond the limits incorporated into the constitution" (Nelson, 1986, p. 283). Consequently when citizens impose new rules, such as TELs, they serve only as palliative measures, because the new rules do not change fundamentally the fiscal relations between government and citizenry. Only a new fiscal constitution can do this.

As a result, TELs in the Leviathan model, despite being characterized as power curtailing tools of the voters, in reality, leave essential outcomes of the "fiscal game" unchanged. This is counter-intuitive. Given its basic assumptions about human rationality, the Leviathan model does not offer a satisfactory explanation of why citizens would engage, sometimes repeatedly, in such futile exercise of control being perfectly aware of its ineffectiveness.

Another problem with the interpretation of TELs arises from the characterization of government as a monolithic entity systematically exploiting citizens through the maximization of tax revenue that it extracts from the economy. Such image obviously echoes the conventional monopolistic behavior in the private sector, but some authors convincingly argued, based on empirical research, that such description may be inaccurate (W. Oates, 1985).

Indeed, the US government is fragmented and decentralized. Since government is fragmented, then in turn, two paradoxes remain unexplained by the model. One is the conspicuous absence of

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[60] More detailed discussion of fiscal illusion can be found in the subsequent section of this chapter

tax and expenditure limits on the federal government, and their simultaneous abundance on the state and local levels. Of all levels of government, the federal government is more likely to act as a monopoly than any others due to its size and vested powers, yet contrary to the model's predictions about voting behavior citizens appear to be more interested in containing less powerful and, hence, less monopolistic governments despite obvious benefits of limiting a bigger taxing authority.

The observed diversity of current TELs presents another paradox. Based on the assumptions of the Leviathan model about the nature of government monopolistic behavior, one would expect a much higher degree of homogeneity of TELs provisions reflecting similar shared visions of the electorate. This however is not so.

In principle, both difficulties can be handled successfully, if the Leviathan model would offer an effective mechanism through which citizens can have an input into both the fiscal decisions made by politicians and the constitutional rules of the game defining the parameters of fiscal policy. Without such necessary modification the Leviathan model looses its traction as far as TELs are concerned.

3.2.3. The Tiebout Model

The eponymous Tiebout model[61], the last on the demand-side, was proposed by Charles Tiebout in his seminal article "*A Pure Theory of Local Expenditures*" (Tiebout, 1956). Principally disagreeing with Musgrave (Musgrave, 1939, 1959) and Samuelson (P. Samuelson, 1954, 1955) about the absence of market solution determining the level of public expenditures, Tiebout suggested that while the Musgrave-Samuelson analysis may be valid for federal expenditures, it may not be applicable to local expenditures.

To fill the conceptual void, Tiebout proposed a fairly simple model that offered a solution for the level of expenditures for local public goods. Its major advantage is more adequate reflection of local preferences in comparison to those on the national level. The Tiebout model rests on the following set of assumptions:

1) consumer-voters are fully mobile and will move to the community, where their preferences for the levels of taxation and services are best satisfied;
2) consumer-voters have complete knowledge of differences of revenue and expenditure patterns among jurisdictions;
3) consumer-voters have many communities to choose from;
4) restrictions due to employment opportunities are not applicable;
5) no spillover effects among communities;
6) the size of community is optimal and population is constant;
7) communities below the optimum size seek to attract new residents to lower average costs and achieve optimum size (Tiebout, 1956, p. 419).

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[61] Also known as the Tiebout hypothesis or Tiebout sorting

Under these conditions, the population will be sorted into optimum communities based on the preferences of consumer-voters and jurisdictions determining equilibrium provision of local public goods. Thus, the model can serve as a useful tool for preference revelation and preference aggregation. Besides, due to its efficiency enhancing properties, the model serves as a local public goods counterpart to the private market's consumer choice. Since its inception the Tiebout model[62] has become one of the most frequently utilized and discussed theoretical constructs of public finance.

The popularity of the Tiebout model can be explained by its relative simplicity, and the fact that it performed successfully in a number of empirical tests (K. Bickers, Salucci, & Stein, 2006; Dowding, John, & Biggs, 1994; Eberts & Gronberg, 1981; Gramlich & Rubinfeld, 1982; Kessler & Lulfesmann, 2005; Munley, 1982; Reschovsky, 1979; Santerre, 1986), which obviously boosted the model's explanatory power.

The model is not without its opponents, however. It was criticized, among other things, for its unrealistic assumptions (Epple & Romer, 1991; Epple, Romer, & Sieg, 2001; Epple & Zelenitz, 1981; John, 1997; W. Oates, 1981), inherent inefficiencies (J. Buchanan & Goetz, 1972), for not offering a satisfactory general theory of local public goods (Bewley, 1981), and failure to fully explain factors leading to local government inefficiency (W. Hoyt, 1990).

Taking into account existing problems, but generally accepting the model's logic of local sorting, a number of authors suggested refinements or extensions based on population factors (Henderson, 1985), possibility of internal voter exit (J. Buchanan & Faith, 1987), use of information heuristics and proxies (K. Bickers & Stein, 1998), zoning (W. Fischel, 1992), falling mobility costs (Rhode & Strumpf, 2003), household location (W. Hoyt & Rosenthal, 1997), heterogeneity in consumer preferences (Bayer, Ferreira, & McMillan, 2007; Brueckner, 2000), and tax competition among jurisdictions (Hendrick, Yonghong, & Jacob, 2007). As a result of recent extensions and modifications, the model has been transformed and often is referred to as the family of the Tiebout models.

Now, how does the Tiebout model fair with regards to TELs? In my opinion, compared with the two previous demand-side models the Tiebout model has much more serious limitations when applied to the analysis of TELs, which in turn raises a possibility that it may be inapplicable for the consideration of fiscal limits at all. I see the following problems with the model.

The first limitation is its scope of application. Similarly to the median voter model, the Tiebout model is the model of local choice. Therefore, it can not be applied to the analysis of fiscal limits on state governments, leaving a significant share of TELs beyond explanation.

The second limitation has to do with community homogeneity. The theoretical purpose of the Tiebout model was to offer a viable solution to the central question of spatial finance, i.e. the impact of taxpayer preferences on municipal fiscal characteristics (J. Rabin, 2003). The model explains it through sorting. The Tiebout sorting occurs when rational taxpayers move into those communities, where taxing and spending patterns reflect their value preferences.

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[62] Or more precisely the Tiebout family of models

The communities are selected based on specific socio-economic determinants, and sorted on the cost-benefit comparison basis through the market choice mechanism of taxpayer mobility with the expectation that as the number of available communities increases, so do the choices of the taxpayers. The ultimate outcome of the sorting process is increased homogeneity of communities with taxpayers grouped efficiently[63] financially and spatially.

Following this logic, TELs should not have happened at all, because the outcomes of the sorting process preclude the conditions requisite for fiscal limits. Community homogeneity *de facto* signals that consumer-voter's preferences are satisfied. Yet, numerous studies of voter support for TELs measures indicate that the main driving force behind fiscal limits is taxpayers' dissatisfaction with various aspects of the public sector[64].

At this point, the logic of the model disintegrates, and fails to explain why and how in homogeneous communities sorted according to taxpayers' preferences, the conditions for voter-consumer dissatisfaction can materialize. This matter is further complicated by the model's own prediction that dissatisfied taxpayers vote with their feet, and move to other jurisdictions, criticisms of model's assumptions notwithstanding.

Indeed, according to the model's logic, external exit is the most likely way for consumer-voters to re-satisfy their preferences. Most studies of voter behavior in relation to TELs do not corroborate this prediction. This inconsistency reveals even deeper problem of the model, the fact that it says nothing about the factors which may affect decision to exit.

Finally, even if we accept some extensions to the model articulating alternatives to external exit, it is still unclear why rational consumer-voters would vote against self-interest and approve fiscal limits. Local TELs usually are imposed across the board and shown to reduce local fiscal autonomy, which implies fewer options for mobile taxpayers to choose from. The model's assumption that voters possess perfect knowledge about fiscal patterns of different jurisdictions, in essence, prevents them from supporting fiscal causes diminishing their welfare, and TELs obviously do so according to many empirical studies.

If we take these objections into account, they point to only one conclusion. The scale of internal inconsistencies and its systemic failure to explain even basic issues associated with tax and expenditure limitations make the Tiebout model inappropriate for the analysis of TELs.

3.2.4. The Budget Maximization Model

The first of the supply-side models, the bureaucratic budget-maximization model reflects Niskanen's theory of bureaucracy (Niskanen, 1971). It was developed as an alternative to the median voter model, and offers a supply side explanation of government behavior.

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[63] Although some studies question the efficiency outcomes of Tiebout sorting
[64] In particular, most explanations of emphasize various specific "hot buttons" of consumer dissatisfaction (e.g.: high property taxes, government inefficiency, etc.).

In its simplest form, the model states that bureaucrats seek to expand the budgets of agencies, which leads to the expansion of staff, increases in budgets, and the extension of areas of control (Bothamley, 2002, p. 69). Niskanen hypothesized that bureaucrats are rational utility maximizers, and their utility function factors in such variables as power, money, reputation, bureau's output, decree of managerial discretion, etc. (Migue, Belanger, & Niskanen, 1974; Niskanen, 1975, 1992, 2005).

The model posits that these variables are a "positive monotonic function of the total budget" (Blais & Dion, 1990, p. 656). Since gains in personal utility depend on the growth in budgetary resources, bureaucratic activities eventually cease being focused on government functions, but instead concentrate on expenditure maximization. Under such conditions, the resources are constantly extracted from taxpayers for the purposes of bureaucratic self-perpetuation[65] (Gosling, 2002; Tullock, 1974). This process stretches far beyond that.

Romer and Rosenthal, building on Niskanen's theory, suggested that through the process of agenda setting bureaucrats "gain from being able to conduct a sequence of elections which outweigh the loss that results from random turnout" (Romer & Rosenthal, 1979a, p. 565). Further studies revealed that not only bureaucrats, but all employees of the agency engage in budget-maximizing behavior (Blais & Dion, 1990).

Thus, the budget maximization model represents an interest group approach to budgetary politics. Following the logic of the model, TELs were an adverse action of citizens to curtail, or even reverse budget maximizing behavior of bureaucrats, and refocus government activities on the satisfaction of taxpayer's preferences for public goods and services. TELs limit budget growth, and, therefore, restrain bureaucratic drive for budget maximization.

On the surface such interpretation appears to be plausible, especially in view of: 1) studies underlining negative voter attitudes towards government employees (Lawson, 1992; Neiman & Riposa, 1986; Sears & Citrin, 1982); and 2) Courant's *et al* reasoning that "as public employees try to enforce higher levels of public sector wages, private voters will force down the share of public employment, which should reduce even more the chance that public sector monopolies will be able to raise wages and exploit the private sector" (Courant, Gramlich, & Rubinfeld, 1979, p. 817).

A closer examination, however, reveals a number of inconsistencies with such interpretation of fiscal limits. First, the reaction of voters to budget maximization appears to be asynchronous. There is plenty of statistical evidence of steady and even accelerating expenditure growth on all levels of government throughout the 20th century consistent with the predictions of the model, but citizens appear to have reacted to it in earnest only in the last thirty years.

It seems improbable that in a democracy voters ignored for so long the adverse effects of bureaucratic behavior on government budgets. After all their taxes support ever increasing budgets, which should have compelled citizens to act preemptively, and impose TELs much earlier.

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[65] In this respect the budget-maximization model is similar to the Leviathan model

Second, the model experiences difficulties with the issue of agenda control when it is placed in the context of TELs. Although, following the logic of Romer and Rosenthal, the power of bureaucrats may be monopolistic, it is, nonetheless, not total. The scale of the current tax and expenditure limitations movement is such that it leaves no doubts about the ability of the electorate to counteract any agenda control efforts by the bureaucrats.

Third, although the model can explain the existence of state TELs – states employ large bureaucracies, local TELs are very difficult to explain within the budget-maximization framework, especially, if we consider the positive attitudes towards local public sector (Cole & Kincaid, 2000). Therefore, as in the case of the median voter model, the budget maximization framework offers at best a limited explanation of the existence and the diverse nature of tax and expenditure limits.

3.2.5. The Rent-Seeking Model

Another supply-side model is the rent-seeking. It is based on an interest group approach to political economy. The term rent-seeking was introduced by Kruger (Krueger, 1974) for a theory developed by Tullock (Tullock, 1967). The latter describes the active creation of monopolies with the aim of achieving super profits or market control in competitive conditions (Bothamley, 2002, p. 459).

In the economics literature rent-seeking is defined as "behavior which improves the welfare of someone at the expense of the welfare of someone else" (Bannock, Baxter, & Davis, 1994, p. 365); and, according to Buchanan *et al,* such behavior "has been with us always" (J. Buchanan, Tollison, & Tullock, 1980, p. 3).

The rent-seeking model is typically associated with the public choice school. This literature views rent-seeking as a privilege seeking by special interest groups (Tullock, 2003, 2005; Tullock & Lott, 1988), and treats politicians as brokers for wealth transfers in the political market. In this environment, "rent seeking groups capable of effective organization demand wealth transfers through special government privileges, government expenditures and tax loopholes", while citizens "supply the financial resources for such wealth transfers through taxes and other government levies" (Poulson & Kaplan, 1994, p. 118). Citizens can form their own interest groups, for example, the taxpayer associations, in order to participate in the decisions on wealth transfers.

Some authors criticized the model for its unrealistic assumptions. For instance, Pasour questioned the assumption that rent-seeking behavior can be identified, waste can be measured and eliminated; and instead, countered that "since the appropriate role of the state is normative, identifying a particular activity as wasteful must necessarily be based on norms that lie outside of economic theory" (Pasour, 1987, p. 123).

The rent-seeking model treats TELs as an element of political market in which the taxpayers, the politicians, and the rent-seekers compete with each other as groups for the purposes of influencing design and implementation of fiscal rules as well as taxing and spending decisions.

In this environment, each interest group relies on fiscal innovation and policy diffusion to shape TELs in a way most beneficial to its members: taxpayers advocate stricter budget constraints, rent-seekers fight to protect their rents, while politicians maximize self-interest.

Poulson explains that "once we recognize that a TEL is an innovation that emerges from the complex decision process, the outcomes of the TEL on taxes becomes uncertain; if the taxpayer group dominates, then we would expect the innovation of the taxpayer TEL to impose stricter budget constraints, and limit rent-seeking activity, the rent-seeking group may influence politicians to introduce a preemptive TEL that is less effective in constraining rent-seeking than the taxpayer TEL, a preemptive TEL designed and implemented by politicians in response from rent-seeking groups may actually erode the budget constraint resulting in a higher rate of growth in state government than would exist in the absence of the TEL" (Poulson & Kaplan, 1994, p. 123).

Surely, characterization of TELs as a policy bargaining tool is appealing. After all, the rent-seeking model infuses the process of fiscal decision making with dynamism; identifies the stakeholders involved in the process of design and implementation of a TEL, and describes economic motives of each group. In my opinion, when compared to the other four models the rent-seeking interpretation appears to be more complete, less contradictory, and it allows more degrees of freedom.

Nevertheless, the rent-seeking model faces a number of conceptual difficulties, which adversely affect its explanatory power with regard to fiscal limits. First, the model treats much larger groups of taxpayers as equal competitors with relatively small groups of politicians and rent-seekers. This reveals the model's cynical view of the democratic process and exposes the tendentious approach to stakeholder identification.

Second, due to their narrowly defined self-interest, politicians and rent-seekers should inevitably have at least some competitive advantage over taxpayers as a result of information asymmetry. Following this logic, it would be reasonable to expect that the vast majority of TELs would be designed and implemented in such a way that would successfully counter budget restricting urges of the taxpayers. Studies of the fiscal effects of TELs demonstrate that this is not true. Furthermore, in many instances taxpayers successfully managed to interrupt the flow of financial resources to governments effectively starving the rent-seekers.

Finally, the model substantially discounts the power of the electorate to invalidate the preemptive behavior of politicians and rent-seekers, while at the same time overstates the predictive powers of the latter. Overall, the rent-seeking model after some necessary modifications can become a valid starting point for the development of the general theory of tax and expenditure limitations. However, in order to be complete and consistent it has to be properly modified and operationalized for the application to the field of public finance.

The summary of the preceding analysis is presented in **Table 1.** As it becomes clear from the table at present none of the five models discussed can fully satisfy the criteria for a comprehensive model of tax and expenditure limitations. Older, more established models of public finance, such as the median voter and the Tiebout, regardless of relatively high degree of

theoretical parsimony face significant problems with explanatory power, general descriptive ability, and even more so with predictive capacity. Both are the models of local choice. This to a considerable degree narrows the scope of their application, and prevents them from offering a more broad-spectrum interpretation of fiscal limits.

Table 1 - Performance of Models of Government on the Issue of TELs
(Table created by author)

Criteria/ Models	Parsimony	Explanatory Power	Descriptive Ability	Predictive Capacity	Empirical Affirmation[66]
Median Voter Model	*High*	*Limited* Problems with the definition of "median"; Agenda control problem	*Moderate* Local choice only; Strategic voting problem	*Low*	*Mixed* (Munley, 1984; Turnbull & Mitias, 1999)
Leviathan Model	*Moderate*	*Moderate* Problems with the post-constitutional period; Description of government as monolith	*Moderate* Performs well with state TELs, difficulties with local TELs	*Moderate* agenda control problem	*Mixed* (Boskin, 1979; Ladd & Wilson, 1982)
Tiebout Model	*High*	*Limited* External exit problem	*Moderate* Local choice only; Community homogeneity problem	*Moderate* Can predict voter behavior after imposition of TELs	*None* No known studies applied it to the analysis of TELs
Budget-Maximization Model	*Moderate*	*Moderate* Agenda control problem	*Moderate*	*Limited* agenda control problem	*Mixed* (Gosling, 2002)
Rent-Seeking Model	*Moderate*	*High* Due to dynamic design	*Moderate* No explanatory tools for post-TELs period	*Moderate* Information asymmetry problem	*Mixed* (Poulson, 2004; Poulson & Kaplan, 1994; Tullock & Lott, 1988)

In comparison, newer the Leviathan, the budget-maximization and the rent-seeking models display, at best, a lackluster performance, despite the fact that their theoretical assumptions are much more flexible, less conditional, and provide ample room for conceptual innovation. Especially disappointing is the inability of the Leviathan model to present a comprehensive treatment of fiscal limits, although it has been developed specifically to address the issue of TELs. In addition, empirical affirmation remains the weakest point. Of the four models commonly employed in empirical research on TELs none led to results that are conclusive either way.

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[66] More detailed review is presented in the next section of this chapter and in chapter 4

The main conclusion of this brief comparative analysis is that currently a comprehensive, internally consistent theory of tax and expenditure limits is lacking. The evolution of conceptual thinking about TELs is yet to produce a viable descriptive model, which would successfully deal with the diverse nature of existing fiscal limits, and, at the same time, which would efficiently explain voter behavior and the effects of limitations on state and local public finances.

3.3. Voter Support for TELs

The preceding discussion will be incomplete without the review of literature on voter support for tax and expenditure limitations. The following review is intended to complement the examination of theoretical issues laid out in the previous sections. Although this research does not directly address any pertinent questions of the theory of fiscal constraints, it, nonetheless, provides valuable insights about the applicability of several previously discussed models of government to the analysis of tax and expenditure limits. The discussion of this section employs thematic approach to the grouping of studies.

3.3.1. The Voter Revolt Explanation

The early studies of voter support for fiscal limitations typically placed them in the broader context of tax revolt, and treated fiscal limits as symptoms of public frustration over the scope of government. In this view, widespread citizens' dissatisfaction has been caused by a number of specific factors, which included: the extensive growth of public expenditure, individual characteristics of the tax systems, and the fragmentation of local governments (J. Danziger, 1980); opportunistic desire for government expenditures coupled with hostile attitudes towards taxes (DeCanio, 1979; J. Reid, 1979); negative reaction to "the relative rather than absolute level of taxation" (D Lowery & Sigelman, 1981, pp. 964-965); and ideological predilections of the electorate expressed in the declining confidence in government (Sigelman, Lowery, & Smith, 1983).

Despite its original popularity among researchers, the tax revolt explanation was not accepted completely, and a number of studies pointed to its internal problems. For example, Danziger and Ring argued that although it is plausible that tax revolt has caused TELs, empirical evidence for it has been inconclusive (J. Danziger & Ring, 1982, p. 48). Similarly, Lucier believed that limitation measures were not constraining enough to give credence to the tax revolt explanation, and underlined that "the tax and spending measures do not add up to a national revolt against state and local government and taxes" (Lucier, 1979, p. 376).

In a contrarian view, Baker, while acknowledging tax revolt as such, claimed that its impact was transmitted not through TELs but through political candidate competition (Baker, 2003, p. 333). Problematic explanatory power of the tax revolt hypothesis precipitated the need to find viable alternatives, especially, in view of new empirical data and accelerating pace of tax and expenditure limitations movement.

As a result, two approaches to conceptualization have been taken. One applied existing models of government and/or voter behavior (e.g.: the fiscal illusion hypothesis, the Leviathan model, the median voter model, etc.) to the research on voter support; while another attempted to construct new explanations (e.g.: policy entrepreneur hypothesis).

3.3.2. The Fiscal Illusion Hypothesis

One of the more established explanations of voter support for TELs, the fiscal illusion hypothesis,[67] assumes that voters are rationally ignorant, and use taxes as a proxy measure of the costs of government. The bureaucrats exploit the cognitive dissonance resulting from incomplete knowledge, and frame the taxpayer's perception by misleading the legislature about the factual costs of supplying different levels of government output (Congleton, 2001; Mueller, 2003). According to Oates, this is achieved by: complex tax structure obscuring real tax burden, rents as a share of local property taxes, built-in tax increases due to the progressivity of the tax structure, implicit future tax burdens resulting from public debt, and intergovernmental transfers (W. Oates, 1988).

When applied to the issue of voter support for TELs, the fiscal illusion hypothesis explains that taxpayers approving fiscal limits vote out of ignorance making decisions based on incorrect perceptions about the real costs of government. Different studies found evidence supporting such explanation, and identified several particular causes of voters' misconceptions such as: tax salience, especially salience of property taxes (Citrin, 1979; Cole & Kincaid, 2000; D. Lowery, 1985; Skidmore, 1994), increasing complexity of tax structure (Baker, 1983), rate of tax growth (Misiolek & Elder, 1988), state aid to local governments (Ellis, 2002), and, finally, omnipresent but often erroneous attitudes about government waste, overpaid bureaucrats, and excessive taxation (Sears & Citrin, 1982).

Despite its relatively strong explanatory performance, some studies challenged the fiscal illusion explanation. For example, Rabushka and Ryan concluded that voters do understand the relationship between taxes and government services when it comes to police, fire, and schools, because the relationship between taxes and services in this case is clear; but they are not willing to support certain social causes, such as welfare transfers, because the taxpayers usually are not the beneficiaries (Rabushka & Ryan, 1982, p. 37). This position is further reinforced by findings of a study, which found that racial composition of the electorate affects voting over taxes (Roch & Rushton, 2008).

3.3.3. The Leviathan Model Explanation

The Leviathan model explanation for voter support stresses the notion that voters perceive the size of government as excessive, and vote for TELs to shrink it. A number of studies relied on the Leviathan model, and identified several key factors, which contributed to such perceptions:

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[67] The hypothesis was developed by the Italian economist Amilcare Puviani and is associated with the libertarian approach to government. (Hamowi, 2008, pp. 258-260)

general negative attitudes towards government (Boskin, 1979; Ladd & Wilson, 1982), distrust of public servants (Lawson, 1992; Neiman & Riposa, 1986), mistrust of elected officials (Cutler, Elmendorf, & Zeckhauser, 1999), high levels of government spending (Maggadino, Toma, & Toma, 1980), general resistance to taxation and specific taxes (Briffault, 2002), more conservative electorate (Magleby, 1998), and finally, perceptions that normal political process has become subverted by a dominant coalition of high demanders of services and allied bureaucracy (A. Denzau & Mackay, 1976; A. Denzau, Mackay, & Weaver, 1979; Nechyba, 1997). The Leviathan model explanation remains popular, and is used in some empirical studies.

3.3.4. The Median Voter Model Explanation

Another group of studies explicitly relied on the logic of the median voter model, and viewed TELs votes as preferences of taxpayers in the middle of the electorate. Following this logic, Temple concluded that TELs "are sought by voters who view fiscal constraints as a device to protect themselves against the possibility of incurring large welfare costs due to the enactment of local fiscal policies that are preferred by other residents but are not preferred by them" (Temple, 1996, p. 1015). Correspondingly, Steel and Lovrich have found that the determinants of public support for state TELs initiatives in Washington and Oregon were consistent with the predictions of the median voter model (Steel & Lovrich, 1998).

Some studies offered a more nuanced view of the preferences of the median voter and their relation to TELs. For instance, Thompson and Green, in a qualifying opinion, argue that, if the issue at stake is one-dimensional, the voting outcomes on TELs reflect those preferred by the median voter, but when the issue is multi-dimensional, the voting outcomes prone to manipulation or unstable, and "they are unlikely to reflect the preferences of a stable and enduring majority" (Thompson & Green, 2004, p. 87).

The median voter explanation has become one of the most accepted explanations of voter support in the tax and expenditure limitations literature, and is often assumed by default in many empirical studies of TELs, but at least one study challenged the applicability of the MVM on the basis of empirical evidence. In particular, Attiyeh and Engle tested the MVM compliant hypothesis that Proposition 13 in California "reflected a failure of local governments to represent adequately the wishes of the of the constituents," but found little evidence to support it (Attiyeh & Engle, 1979, p. 132).

3.3.5. Hybrid Explanations

Many studies incorporated various factors of demand for and supply of government services to explain voter support for TELs. Based on such approach, Freiman and Grasso analyzed voter behavior in Michigan, and determined that "receipt of government services, utilization of specific sources of finance such as residential property taxes, and variables measuring the level of demand, all were determinants of voter behavior" (Freiman & Grasso, 1982, pp. 49-50).

Vigdor has tested the non-resident hypothesis of voter preferences for statewide TELs, and determined that limits pass because "they effectively extend the voting franchise to individuals who have no standing in local elections;" because non-resident voters may receive rents from employment, or may own taxable assets in other jurisdictions, or "because changes in other jurisdictions might influence their own residential location choice" (Vigdor, 2004, pp. 472-473).

Alm and Skidmore explored the relationship between personal income levels and TELs, and found that "states with increasing levels of income are significantly more likely to impose TELs," but political and demographic characteristics of the state had little impact on TELs outcomes (Alm & Skidmore, 1999, pp. 483-484). Some attempted to redefine demand for government services by placing them in the context of a policy market. In particular, using this venue Kirlin explained that voters support fiscal limits when they demand broad politico-economic change and not only fiscal change (Kirlin, 1982).

3.3.6. The Policy Entrepreneur Explanation

Finally, a number of studies can be conditionally grouped under the rubric of "policy entrepreneur". They attribute the passage of TELs to the actions of either political activists[68] or single-issue interest groups. For instance, Smith argued that anti-tax ballot initiatives are influenced by special interests playing a powerful a role in swaying public opinion, and that grassroots support for the initiatives is nothing but a façade (D. Smith, 1998, 1999, 2004).

Similarly, Magleby pointed out that that campaign management in initiatives is organized by elites who involve mass audiences merely for the issue to qualify for the ballot, and to win on election day (Magleby, 1998, 2001). Stankiewicz emphasized the critical role of anti-tax entrepreneurs (Stankiewicz, 2005). Young pointed out that anti-tax direct democracy initiatives are vulnerable to wealthy and powerful special interests (B. Young, 2005), while Hill described the role of a variety of interest groups acting as policy entrepreneurs in shaping public opinion about TEL proposal in Ohio (Hill, 2006). In a related research, Tolbert attributed the success of TELs and supermajority rules to the reemergence of grassroots policy populism fuelled by white, lower and middle class economic anxiety in a period of rapid socioeconomic change (Tolbert, 1996).

As we can see from the above review this line of research offers a wide variety of explanations of voter support for the measures of fiscal containment. Such variety to a large extent is a result of diversity of theoretical interpretations of TELs discussed in the previous sections of this chapter. And since at present there is no consensus in public finance about the fiscal nature and the role of TELs, the spillover effects of such state of conceptual affairs inevitably affect research on voter support.

Two features of this body of research loom large. One is the fact that no empirical studies tested the explanatory power of existing explanations comparatively for the purposes of establishing which explanation is superior.

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[68] Such as, for example Howard Jarvis and Paul Gann, the most vocal and ardent supporters of Proposition 13 in California

Another feature is apparent methodological overreliance on simple cause and effect linear reasoning. Only a limited number of studies in this sample attempted to treat voter support for TELs as an interaction of different factors. Both methodological preferences to some degree discount the value of research, and contribute to the inconclusiveness of its findings.

In summary of this chapter it is necessary to conclude that the substantive nature of tax and expenditure limitations as a complex fiscal phenomenon remains open for further conceptual development and interpretation.

At present, there is no comprehensive, internally consistent and generally accepted theory of fiscal limits, which, on the one hand, could provide a satisfactory treatment of existing complexity of TELs; and on the other hand, could offer a reliable, robust, efficient, and empirically testable model of fiscal limits.

Current research on TELs relies on models which are borrowed from other fields. This creates significant application difficulties, and affects the quality of research. In the opinion of this author, such lack of comprehensive theory of fiscal limits is not the result of lack of interest on part of academic community, but is due to the fact that significant aspects TELs remain underexplored. At present the field of public finance does not possess sufficient research evidence that would allow constructing appropriate theory.

CHAPTER 4. PAST RESEARCH ON THE EFFECTS OF TAX AND EXPENDITURE LIMITATIONS

This chapter reviews the extant empirical research on the effects of tax and expenditure limitations. This growing body of literature examined governance, fiscal, management and other public sector consequences of the imposition of TELs on state and local governments. Depending on specific research questions, individual studies can be divided into several fairly large but uneven groups.

One group examined overall effectiveness of limitations as a tool of fiscal containment. The results of this research were mixed.

A second group of studies was more descriptive and focused on governments' reaction to the imposition of TELs. Its main finding is that state and local governments responded to limits with various counter-measures. These measures either negated or eroded the intended effects of TELs.

A third group studied the equity effects of TELs on various strata of population and concluded that, in general, the equity effects have been negative. The largest group of empirical studies investigated fiscal and structural effects of tax and expenditure limitations on various types and levels of governments. Two methodological approaches characterize this line of inquiry – single state and multiple states research designs. Its overall findings suggest that TELs had extensive systemic ramifications for the governance structures of the local public sector and its financing mechanisms.

Finally, a separate but group of studies looked into the effects of TELs on public education. This research yielded mixed results. The subsequent sections of this chapter will present the detailed review and the analysis of this body of research following the same thematic sequence.

4.1. Overall Effectiveness of Tax and Expenditure Limitations

The general effectiveness of tax and expenditure limitations as a tool of fiscal containment is indisputably one of the central questions of the entire research agenda on TELs. The principal claim of proponents of the limits is that they arrest or even reverse public sector growth by restricting government budgets either by limiting government revenue base, or by restricting government spending, or in some instances by curbing both. The critical importance of the question led to the investigation of the relationship between TELs and the size and scope of the public sector.

The underlying logic of this research stream is to find evidence either supporting or refuting the claims that tax and expenditure limitations are effective in reducing the size and scope of government. As it often happens in the social sciences, at present, no definitive conclusion on the issue has been reached, and at least three rivaling opinions have been formed - affirmative, negative and agnostic.

Those authors who had found that TELs were effective tools of fiscal containment reached this conclusion based on the analyses of the state and local public sector size, government spending patterns, allocation of expenditure responsibilities among governments, revenue yields and mixes as well as general and relative levels of government indebtedness.

Following this methodological approach, Preston and Ichniowsky established that limitations were generally effective irrespectively of different institutional designs (Preston & Ichniowsky, 1991, pp. 134-135). In turn, Elder provided strong evidence that "revenue and expenditure limitation laws can be effective tools to contain tax burdens" (Elder, 1992, p. 47). King-Medows and Lowery concluded that fiscal caps restrict government growth because the share of state and local governments in the economy declined more sharply in limit states (King-Medows & Lowery, 1996, p. 109).

Similarly, Dye and McGuire found that TELs were effective at lowering the growth rate of property tax revenues and the expenditures they finance (Dye & McGuire, 1997, pp. 485-486). Brown concluded that the Colorado TEL specifically limiting municipal revenues was effective for its purpose (Brown, 1999), while the comprehensive TEL did effectively constrain growth and reduced local government reliance on the property tax (Brown, 2000, p. 29).

In the opinion of McGuire, property tax limits have the potential to improve welfare (T. McGuire, 1999, p. 129). Bails and Tieslau concluded that, since states with TELs have significantly lower per capita state and local spending, TELs can be effective measures of fiscal containment (Bails & Tieslau, 2000, pp. 271-272).

Poulson maintained that "TELs[69] can significantly reduce state and local spending". In his opinion, constitutional TELs are the most effective, especially if they tie government spending to inflation and population growth, refund revenues above TEL limit, and are linked to balanced budget rules (Poulson, 2004, p. 1). Following the same line of reasoning, Krol concluded that TELs can slow the growth of government by reducing state spending, taxes and debt (Krol, 1997, p. 305, 2007, p. 442).

These findings are challenged by researchers, who looked at the question of TELs effectiveness through the prism of a larger budgetary framework, rather than separate fiscal statistics[70]. These studies concluded that TELs were not effective in constraining public sector growth. For instance, Pascal underlined that although fiscal limits have generally slowed the rate of government growth, their effectiveness has not been as great as their supporters had hoped (Pascal, 1979).

In a similar manner, Bails doubts the efficacy of TELs stating that "TELs as presently construed are an ineffective means of limiting growth in state budgets (Bails, 1982, p. 139, 1990, p. 223)". Bennet and Dilorenzo found evidence that state-imposed TELs have not reduced local spending

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[69] In addition to other budget rules

[70] This group of studies often maintained that looking at the question of TELs effectiveness by relying on selected fiscal data is meaningless and misses the point of valid comparisons because such approach ignores the political aspects of the normal budgetary process as well as varying degrees of expenditure pressures and responsibilities individual state and local governments can be under.

because local governments responded by placing a significant share of their expenditures off-budget, "financing them through various off-budget enterprises" (Bennet & Dilorenzo, 1982, pp. 333-334)[71].

In the opinion of Abrams and Dougan, TELs "do not exert a significant independent effect on aggregate budget decisions" (Abrams & Dougan, 1986, p. 112). Howard concluded that TELs "had played only a limited role in holding down state government revenues and expenditures" (Howard, 1989, p. 89), which is similar to the findings of Cebula about state budgets (Cebula, 1986).

Cox and Lowery found little evidence that fiscal caps have had much impact on state finances (Cox & Lowery, 1990, p. 492). Kim determined that neither Proposition 13 nor Proposition 4 in California have been effective in reducing the size of general city expenditures in real dollar terms, nor have they reversed the annually increasing trends of per capita tax and non-tax burdens (K. Kim, 1992).

In a strong view of Terrell, TELs have increased rather than constrained state sector growth (Terrell, 1993). In another comparative study of California's Proposition 13 and Massachusetts' Proposition 2½, Galles and Sexton concluded that "neither initiative was able to permanently restrict the size of state and local governments" (Galles & Sexton, 1998, p. 131). Based on a larger sample Kousser *et al* concluded that "TELs failed to constrain the size of government in three out of four examined states, and in the fourth state there was anecdotal evidence that politicians were finding their ways around the limit" (Kousser, McCubbins, & Rozga, 2006, p. 43).

Such conflicting conclusions about TELs effectiveness are further complicated by a number of studies with inconclusive or mixed results. This research often combined methodological approaches of the other two camps. For example, Ladd concluded that TELs are justified only on temporary basis, because "the economic benefits from controls motivated by the desire to limit local public expenditures are likely to be slight, while the costs, in terms of service levels distortions, are potentially significant" (Ladd, 1978, p. 14).

Assessing research methodology options, Courant and Rubinfeld asserted that "there is no simple test for discovering whether tax limitations will be harmful or helpful [to welfare]" (Courant & Rubinfeld, 1981, p. 315).

Furthermore, Faulkner argued that TELs merely address the symptoms not the causes of excessive public spending and, therefore, they are not effective as a first best choice (Faulkner, 1982). In turn, Lowery did not find that TELs have sharply reduced expenditures and local employment, but they were effective in reducing property taxes (D. Lowery, 1983, p. 247).

In the same fashion, Shadbegian pointed out that "while TELs restrict government size and growth in states with below average income, in general, they have no significant effect on the size or growth of government" (Shadbegian, 1996, p. 22).

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[71] Section 4.2 presents a more detailed discussion on the issue of government reaction to TELs.

After the analysis of three TELs proposals in Iowa, Edelman concluded that their effectiveness in relation to stated objectives of reducing tax burden and government spending has been mixed at best (Edelman, 1999).

Stansel, while conceding that some TELs "have been clearly ineffective"; nonetheless, maintains that "despite their substantial flaws TELs can work" by slowing the rate of growth of spending and taxes, if they are properly designed (Stansel, 1994, p. 24), which is very close to the position of Ladd (Ladd, 1999).

Focusing on the mode of TELs adoption, Matsusaka concluded that while the voter initiatives do not have a consistent effect on the overall size of state and local government, they nonetheless lead to expenditure decentralization (J. Matsusaka, 1995; J. Matsusaka, 2000).

Following the same investigative approach, New concluded that while TELs enacted by citizen initiatives cause per capita public spending to decrease, TELs enacted by state legislatures are associated with an increase in government expenditures. Furthermore, TELs that limit government spending to the inflation rate plus population growth, and mandate immediate rebates of government surpluses are more effective at limiting government outlays (New, 2001, 2003).

In an interesting study that slightly restated the question of TELs effectiveness as a question of TELs usefulness, Deller and Stallman expressed a contrarian view that growth in the public sector was a natural byproduct of overall economic growth, and that local TELs do not affect economic growth in the long run.

Additionally, Deller and Stallman convincingly argued that state TELs may have a positive impact on economic growth, possibly because public services that matter the most for overall economy are provided by state governments (Deller & Stallmann, 2006, pp. 537-538).

In view of these contradictory findings, the question of effectiveness of TELs in constraining public sector growth remains open, despite substantial progress that has been made in the last three decades of research. Several factors could have contributed to the continuing uncertainty.

One is the often concealed ideological bias of some studies noticeable in the construction of arguments and in the interpretation of obtained empirical evidence. A consistently reliable methodology represents another problem, especially when it comes to the choice of testable hypotheses and the relevance of data.

Finally, sometimes generalizability of findings is also an issue. In the opinion of this author, it is unlikely that the question of TELs effectiveness can be conclusively answered without successfully dealing with the issues of bias and methodology mentioned above. On another hand, the argument advanced by Deller and Stallman may signal the underlying problem with the research question itself, which, in view of the inconclusive findings, may need to be refocused on the question of TELs utility rather than effectiveness.

4.2. Government Reaction to Tax and Expenditure Limitations

The imposition of limits has created an inducement for state and local governments to respond to newly imposed fiscal stringency measures with various counter-measures intended to ameliorate the effects of TELs on government budgets and operations.

Those included: putting significant share of governmental activities off-budgets, thus creating multiple fiscal firewalls (Bennet & Dilorenzo, 1982; Chapman, 1983; Tyer, 1989); manipulating revenue and expenditure mixes in pursuit of changing public opinion to unfavorable to limits (Figlio & O'Sullivan, 2001; Ibele, 1997; Merriman, 1987); shedding service responsibilities on special purpose and private governments (Bourdeaux, 2005; Cheung, 2008; Foster, 1997); and increased general and per capita indebtedness (Baer, 1993; Costello, 1977; Sterk & Goldman, 1991).

A number of studies have examined such opportunistic behavior with the general conclusion that government response was proportionate to the degree of TELs stringency, and is inversely correlated with the fiscal conditions of individual governments. Given the individual fiscal condition, the larger was the fiscal shock created by a TEL the more likely was the government to resort to counter-measures.

White in an early study of governments' reaction to TELs projected that "governments pursuing manipulative strategies will cut public inputs depending on households' propensities to substitute extra private for reduced public inputs, either in total or at the margin"; and that "governments tend to cut those public inputs most that are inelastically demanded, or that can be relatively easily moved from the public to the private sector". However, when spatial discrimination is possible, governments under limits " will cut spending more in high than low income areas, which will lead to budget outcomes generating excessively high welfare costs" (White, 1979, p. 208).

Poterba suggested that states with TELs make more drastic and more rapid budgetary adjustments in case of revenue shortfalls, or when spending exceeds projections (J. Poterba, 1994, p. 818).

Figlio and O'Sullivan provided evidence that local governments operating under statewide tax limits[72] manipulate their mix of productive and administrative services cutting the former by disproportionally larger amounts than the latter in an attempt to influence voters to override statewide limit (Figlio & O'Sullivan, 2001, p. 233).

Bowler and Donovan indicated that not only TEL states shifted their revenue and expenditure mixes in response to limits, they have also created "new political jurisdictions that have the power to tax, charge, and/or borrow"; and that these new entities "are low-visibility creatures" adversely affecting popular control over fiscal politics" (Bowler & Donovan, 2004, p. 195).

However, a study by Carr insists that while the registered increases in the numbers of special districts are indeed observed in states with most restrictive TELs, this happens only when the

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[72] Particularly cities run by city managers

effects of state and local TELs are examined together (Carr, 2006, p. 491). Carr's cautionary position corresponds with Lewis' (Lewis, 1998, pp. 45-48) and Lyon's (Lyon, 2000, pp. 17-18) about the lack of evidence that TELs are associated with creation of more special districts[73].

Compared to other groups of studies the research on government response to limitations is relatively smaller in terms of number of individual studies, but it continues to grow as more studies investigate the exact nature of government reaction.

4.3. Effects of Tax and Expenditure Limits on Vertical and Horizontal Taxation Equity

Fairness is one of the fundamental principles of taxation. It is measured by horizontal and vertical equity - the two dimensions reflecting individual ability to pay taxes. The underlying principle of tax equity is tax neutrality, the rule that a tax system should treat individuals in similar circumstances equally, and should not distort economic behavior unnecessarily (Musgrave & Musgrave, 1989, pp. 1057-1058).

Theoretically, tax limits reduce the amount of tax paid,[74] and lower tax burdens of individual taxpayers. Expenditure limits on the other hand decrease government spending on public services, and thus diminish the amount of benefit individuals can receive. Following this logic, and given different economic circumstances of individuals, fiscal limits are likely to have adverse effects on both horizontal and vertical equity.

Past empirical research, for the most part, confirmed this assumption and uncovered greater regressivity of state and local tax systems after the imposition of fiscal limits. Describing negative equity effects of TELs, Menchik and Pascal cite increased regressivity of revenue systems as a result of higher reliance on user fees and charges; reduction or elimination of funding for redistributive programs, and reduced career opportunities in the public sector for minorities (Menchik & Pascal, 1980; Pascal & Menchik, 1979).

Merriman studied New Jersey's local TEL, and concluded that not only it has distorted local government outcomes, but also its design "may have important distributional consequences" (Merriman, 1986, p. 360). Brunori *at al* concluded that declines in the local property tax revenues as a share of total tax revenues caused by TELs undermines "the stability and fairness of the local tax systems", and as a result, some categories of taxpayers are more adversely affected than others by the tax shifts associated with TELs (Brunori, Green, Bell, Choi, & Yuan, 2005, pp. 28-29, 42).

Several studies looked into equity effects of TELs in California, and reported strong negative impacts. For example, O'Sallivan *et al* found that California's Proposition 13 "created a tension between horizontal and vertical equity, because households that are similar in all respects except mobility rates will be treated differentially" (O'Sullivan, Sexton, & Sheffrin, 1994, p. 728). Shires *et al* reported that since the adoption of Proposition 13 long-term homeowners often pay much less in property taxes than recent homebuyers in the same neighborhood (Shires, Ellwood,

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[73] At least in California
[74] Depending on the type of tax limit

& Sprague, 1998, pp. 11-12). This is consistent with the findings of Sheffrin and Sexton, who found that "Proposition 13 has created wide disparities in property taxes between homes purchased more recently and those owned for many years" (Sheffrin & Sexton, 1998, pp. 31-35).

Wiseman examined the distribution of effective property tax rates under the assessment system introduced by Proposition 13, and determined that assessment ratios differ significantly among and within property types; and that within property classes, assessment ratios and effective rates of property taxation are inversely related to property values (Wiseman, 1993, p. 391).

O'Sallivan *et al* concluded that the acquisition-value tax system in California has created numerous problems with horizontal and vertical tax equity (O'Sullivan, Sexton, & Sheffrin, 1995). However, a study by Reschovsky and Schwartz demonstrated that the adverse equity effects of TELs can be ameliorated by government action. In particular, Reschovsky and Schwartz concluded that Massachusetts state government has successfully countered fiscal disparities across local governments after Proposition 2½ with the help of need-based aid (Reschovsky & Schwartz, 1992, pp. 496-497).

In contrast to this consensus, some studies counterclaim that the equity effects of TELs have been in fact mildly positive. This is the position of Fernandes and DeTray, who have compared tax limitation laws in California and New Jersey, and concluded that combined state and local taxes have moved in the direction of increased progressivity (Fernandes & DeTray, 1985).

Similarly, Lowery argued that "state and state-local tax systems were somewhat better after the tax revolt when they had been before, if greater elasticity and progressivity are used as important criteria and desirable attributes of a sound fiscal system" (D. Lowery, 1986, p. 749).

At the same time, two studies reported either mixed or negligible equity effects of TELs. For example, Waters *et al* determined that the imposition of a TEL in Oregon has made state's tax system slightly less progressive at the top of the income distribution, but slightly more progressive at the bottom (Waters, Holland, & Weber, 1997, p. 72). However, Anderson stated that "limits on tax revenues and rates do not directly affect either vertical or horizontal equity, but assessment limits can sacrifice both" (Anderson, 2006, p. 692).

4.4. Fiscal Effects of Tax and Expenditure Limitations (Single State Studies)

4.4.1. California

Studies investigating various fiscal and governance effects of tax and expenditure limitations are the largest group in this entire body of research. Many studies have investigated the effects of TELs on state and on general and special purpose local governments either in individual states or in small samples of states. States with the oldest or the strictest TELs have received the bulk of attention, and the effects of TELs on state governments have been studied more systematically than the effects on local governments. This is probably due to the fact that the former had more resources available for independent fiscal research. The availability of local government fiscal data in the late 1970s and early 1980s has also been a limiting factor for some time.

In this group of studies California remains by far the most frequently and most extensively studied limit state, thanks to its frontrunner's status in the modern tax and expenditure limitations movement. The adoption of Proposition 13 in 1978 has led to a lot of speculation about potential effects of the limits[75].

Many early studies of the effects of Proposition 13 were essentially doom-and-gloom policy reports presenting various scenarios of complete collapse of state and local finances, and only few realistic assessments based on solid empirical evidence. For example, in one of the more balanced analyses, Shapiro and Morgan have forecast structural reconfiguration of the entire system of California's state and local finances, increased focus on alternative sources of revenues; and a heavier local reliance on major state revenue sources such as the income and sales taxes to finance locally provided services (Shapiro & Morgan, 1978, p. 119).

As more financial data had become available, the analyses have shifted from predicted or anticipated to actual effects of Proposition 13. The findings usually revealed major fiscal changes taking place on both state and local level. For instance, Oakland while characterizing the effects of Proposition 13 on state expenditures as insignificant, also reported a shift of a major portion of local revenue raising responsibility to the state, which lead to a serious erosion of local control; worsened fiscal relations at the local level due to needless competition for fiscal resources caused by the need to share remaining local property taxes (Oakland, 1979, p. 406).

Kirlin and Chapman indicated that Proposition 13 has made California's intergovernmental system more interdependent by disrupting established patterns of relationships and by making local governments more reliant on state transfers (Kirlin & Chapman, 1979, p. 273).

Walker's analysis of California's criminal justice system in the aftermath of 1978 vote registers the trend for more centralization caused by a growing involvement of federal and state governments in local affairs, and by a conflict between local autonomy and the mandates of higher-level governments (Walker, 1980).

However, some of these findings were partially contradicted by Rabushka and Ryan who concluded that Proposition 13 neither did weaken revenues of state and local governments because tax collections have been boosted by rising assessments, nor has it negatively affected services (Rabushka & Ryan, 1982, pp. 203-204).

Several studies reported asymmetrical effects of Proposition 13 on different types of governments, and particularly on municipalities (Kemp, 1980; Lipson & Lavin, 1980; Mushkin, 1979; Raymond, 1987; Schwadron & Richter, 1984). For example, Sherwood-Call noted that the effects had differed considerably among jurisdictions with cities more affected than counties and school districts. This happened due to higher reliance on local source revenues, but "was eventually mitigated by gradual increases in alternative non-tax sources" (Sherwood-Call, 1987, p. 66).

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[75] Based on the author's own count at least 13 government and think tank reports have been circulated just in the period between 1978 and 1979 alone, while the number of serious analytical or investigative newspaper and magazine articles devoted to this topic well exceeded 30.

Reid concluded that despite being affected the most, cities in California "have responded to reductions in revenues outside their direct control by increasing revenues from sources within their direct control, rather than reducing expenditures" (C. Reid, 1988, p. 20).

Ibele pointed out that municipalities despite more serious fiscal problems created by Proposition 13 realized increases from alternative revenues, but certain types and sizes of cities, nonetheless, experienced long-term reductions in total revenues (Ibele, 1997).

Other studies focused on the general effects of California's fiscal limits, and have determined that the entire system of state and local fiscal relations has been reconfigured by the mid 1990s. In relation to this, Chapman generalized that Proposition 13 led to: increase in state control over county finances, the growth of arcane finance techniques such as assessment districts, and the fiscalization of land use as cities increasingly employed redevelopment as a municipal revenue generator (Chapman, 1998, pp. 11-22).

Drawing on earlier findings of Oakland, Silva and Barbour, noting the same continuing trends, concluded that Proposition 13 has created the public finance system that copes with fiscal stress through cost-shifting and competition between levels of government (Silva & Barbour, 1999).

Specifically concentrating on the revenue effects, O'Sullivan *et al* reached a general conclusion that TELs significantly changed the fiscal structure of local government in California by causing property tax revenues to decline in importance. Moreover, the degree of decline and the extent of substitution of lost property taxes by state subventions has varied significantly among individual local governments due to different degrees of success in finding alternative sources of financing of various infrastructure demands (O'Sullivan, Sexton, & Sheffrin, 1995, pp. 103-107).

Similarly, Sexton *et al* concluded that post-Proposition 13 decline in the relative importance of the property tax has transformed it from a local tax to a statewide tax forcing the pursuit of alternative revenue sources by local governments (Sexton, Sheffrin, & O'Sullivan, 1999, p. 106). This finding is consistent with the findings of Hoene (Hoene, 2004). In the opinion of Roldan, state TELs have hampered the California's economy because state government had to shift funds to rescue local governments at the expense of public capital outlay expenditures (Roldan, 1995).

4.4.2. Colorado and Massachusetts

The fiscal effects of TELs have been regularly studied in two other states – Colorado and Massachusetts but not as often as California's, and for somewhat different reasons in each specific case. Colorado has been studied because of its strictest fiscal regime in the nation created by the Taxpayers Bill of Rights (TABOR) of 1992. Colorado's status of the fiscal outlier continues to attract strong attention because the extreme stringency of imposed constraints created unusual patters in the state and local finances.

Many effects of TABOR are comparable to those in California such as a trend for financial centralization, asymmetrical effects of limits on different local governments, and altered revenue

mixes, but they are much more pronounced. For example, a study by James and Wallis pointed out that the effects of TABOR on state and local budgets have been cyclical; that TABOR "has significantly cut the rate of growth of state government relative to what would have occurred in the absence of the amendment"; and that in the post-TABOR period cities increased their reliance on non-tax revenues, while counties experiences general slowing in revenues in expenditures (James & Wallis, 2004, pp. 16, 25, 26-28).

Describing overall economic effect of TABOR, McGuire and Rueben concluded that it "did not significantly boost Colorado's economy", while the evidence of its effects on employment were mixed (M. McGuire & Rueben, 2006, pp. 10-11). In a recent study Martell and Teske concluded that TABOR has reduced, and altered the size and scope of Colorado's state government relative to the economy and other western states, but they have cautioned that "the efforts of TABOR to achieve fiscal control have paradoxically weakened general management options because TABOR supported a shift from representative government to direct democracy whereby narrow-focus interest groups "secure dedicated revenue sources through constitutional amendments" (Martell & Teske, 2007, pp. 683-684).

In comparison, Massachusetts' public finances have not suffered the dramatic restrictions of Colorado, but they have been often examined as well for two reasons. One is that the commonwealth followed California's lead, and has quickly adopted in 1980 its own comprehensive fiscal limitation measure known as Proposition 2½, making it one of the oldest in the modern wave of limits.

Another has to do with Massachusetts' historically distinctive structure of local government and politics[76]. In Massachusetts's case, the research findings are consistent with those from California and Colorado and report the same fiscal trends. For example, Jian determined that local governments constrained by the Proposition 2½ offset the loss of tax revenue by increased use of non-tax revenue sources, especially state aid; that many governments have shifted a substantial part of the tax burden outside the community; and that Proposition 2½ forced tax rates below their optimal level, and induced excessive reliance on user fees and charges (Jian, 1995).

Similarly to Reid's and Ibele's conclusions about differential effects of TELs on various governments in California, Bradbury *et al* found that Proposition 2½ significantly constrained local spending in some communities compared to others, but the former had managed to realize gains in property values (Bradbury, Mayer, & Case, 2001).

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[76] Massachusetts similarly to other New England states, New York and New Jersey has a governmental structure commonly known as the New England town. In it county government is typically weak and the towns are of much greater importance than the counties are. Towns are governed by a town meeting form of government.

4.4.3. Small Samples Studies

A number of studies investigated the effects of limits in small samples of states. This research agenda focused on local rather than state governments, but its conclusions do not substantially deviate from single case studies, and disclose familiar patterns of increased reliance on state aid by localities, rising share of non-property tax revenues in the revenues mixes, and active search by local governments for alternative financing.

For example, Menchik *et al* examined the effects of TELs on municipal governments in California, Kansas, and New Jersey, and concluded that state aid to a large extend ameliorated declines in local spending, but in some instances the levels of key public services declined even despite efforts to improve efficiency (Menchik, Fernandez, & Caggiano, 1982). This finding is consistent with the results of another study of the relationship between local TELs and neighborhood quality (Nibarger, 2006).

DeTray *et al* using the same data as in the study of Menchik *at al* concluded that the balance of revenue streams used to finance public services has shifted towards non-property tax revenues, benefits-based financing and intergovernmental transfers (DeTray, Fernandes, Pascal, & Caggiano, 1981). According to Lyons and Lav, state aid despite its increasing importance as a source of revenue helps localities avoid cutting services in the short run, but it is unreliable over long term (Lyons & Lav, 2007, p. 1).

Two studies concluded that TELs lead to less local democracy, not more. In particular, Stallman compared the effects of TELs on local governments in Colorado and Missouri, and concluded that despite some initial efficiency gains, governments eventually found ways to circumvent the restrictions as they become more severe. This in turn added to inefficiencies, and reduced both representative and direct democracy (Stallman, 2007). Similarly, Cheung found a positive correlation between the existence of local TELs and the rate of growth in the number private governments, which are usually neither subjects to limits nor normal democratic process (Cheung, 2008).

4.5. General Effects of Tax and Expenditure Limitations in Comprehensive Studies

In addition to single state and small sample studies fiscal and governance effects of tax and expenditure limitations have also been examined more comprehensively across states, levels and types of governments. These studies can be divided roughly into three sub-groups:

1) describing the impact of TELs on state governments;
2) describing the effects on local governments, and finally;
3) studies measuring interactive effects of state and local TELs.

Similarly to single state designs, early comprehensive studies of fiscal effects of TELs were policy reports that predicted major fiscal and governance changes such as: more centralized state-local fiscal system with expanded state role in financing public services (Noam, 1979), increased incentives for local governments for budget obfuscation, and greater pressure on the

federal government for financial aid to both local and state governments (Ellickson, 1979); erosion of local control over resource allocation in the delivery of public services (Shapiro, Puryear, & Ross, 1979); and asymmetric effects on communities in different fiscal conditions (Merriman, 1983).

Subsequent empirical studies of state governments have generally confirmed these predictions, and revealed a variety of mostly negative fiscal and governance effects of state TELs. Among them were: substantially depleted state budget balances (S. Gold, 1984); distorted capital financing decisions (Raimondo, 1983); restricted expenditures of state budgets (Zax, 1989); diverging patterns of fiscal behavior of non-limit and limit states, with limit states relying upon intergovernmental transfers and miscellaneous revenues more than non-limit states (Raimondo, 1992, pp. 148-149); lower borrowing costs for expenditure limits states and higher borrowing costs for tax limits states (J. Poterba & Rueben, 1999, pp. 37-39); as well as increased probability of passing state lottery in the presence of specific TELs (Glickman & Painter, 2004, p. 36).

At the same time, empirical studies of local governments have revealed a drastically changed local public sector characterized by: more centralization and eroded local responsiveness (Mullins & Joyce, 1996); dramatically reduced fiscal flexibility (J. Mikesell, 1986, 1993); diminished local government autonomy (A. Sokolow, 1998; A. Sokolow, 2000); greater than before reliance on local non-tax sources of revenue (Shadbegian, 1999) such as state aid and user fees and charges (McCabe, 1997; McCabe & Feiock, 2000; Raimondo, 1983); general decreases in the level of expenditure and revenues (Shadbegian, 1998; Skidmore, 1994); increased service differentials across general purpose and school governments asymmetrically affecting more disadvantaged populations (Mullins, 2004); and finally, slower local government employment growth and lower salaries compared to other sectors (J. Poterba & Rueben, 1995; Rueben, 1997);

Equally interesting, but not much different picture has emerged as a result of the analysis of interactive effects of simultaneous state and local TELs. In particular, Joyce and Mullins found that: while state TELs alone had almost no effect on reliance on general tax revenue sources of local governments, a combination of state and local TELs affected local governments more.

At the same time, state TELs had little impact on the relative amount each government level spent in various functional categories[77] (Joyce & Mullins, 1991, p. 240). Using the same lens, Skidmore determined that binding local TELs were associated with reductions in local revenues and increases in state aid to local governments; while state TELs were related to reductions in both state and local own source revenues (Skidmore, 1999, p. 98).

Taking a slightly different approach to categorization of the effects, a study by Kirlin identified the effects directly impacting governmental dynamics, and those resulting indirectly from governments' adjustments to limits. The first included: reduced revenues and/or expenditures; popular and political cultures of fiscal constraints; significant restrictions upon future fiscal decisions by elected bodies and/or the electorate; greater than before transaction costs imposed upon governments; increased conflicts over revenues and/or expenditures between the state and local governments and private interests.

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[77] With an exception of public welfare spending

The indirect effects included: diminished intelligibility of government activities; reduced transparency and accountability; and fragmentation of governmental authorities, competencies and fiscal resources (Kirlin, 1997, pp. 204-208).

From the empirical evidence presented in this section it is possible to summarize that the general effects of tax and expenditure limitations on state and local governments have been transformative both in terms of scope and scale of their impact. These changes have been a cumulative result of the confluence of multiple trends, such as "a shift toward non-tax sources of revenue for financing local public services, a vertical shift of power and responsibility to the state; and horizontal shifts of responsibility for local government functions" (Mullins, 2003, p. 96).

4.6. Effects of Tax and Expenditure Limits on School Finances

The review of the effects of tax and expenditure limitations would be incomplete without the findings of the studies examining the impact of fiscal limits on public education finances. The provision of primary and secondary education remains one of the most important local government functions. School districts often have been subject of limitations despite their separate status of special purpose governments, and, arguably, more apparent link between taxes and services. This group of empirical studies attempted to determine whether the general effects of limitations on school finances were positive or negative. Typically the effects were measured along three dimensions:

1) the size and structure of school districts' budgets;
2) educational outcomes[78], and;
3) organizational inputs[79].

The overall results of this research are inconclusive with approximately equal number of studies reporting either negligible or negative effects of TELs, while a significant proportion reporting mixed findings.

Among those who reported negligible effects, Downes and Figlio concluded that constitutional constraints had little effect on the quality of public education (T. Downes & Figlio, 2001, pp. 7-27). Downes *et al* emphasized "only limited evidence that student performance in districts subject to the tax limitations has fallen relative to student performance in districts not subject to the limitations" (T. Downes, Dye, & McGuire, 1998, p. 401).

Similarly, Shadbegian concluded that state TELs had only a small impact on public education, because local TELs decreased the level of local own-source expenditures on education,[80] while simultaneously increasing the level of state educational spending[81] (Shadbegian, 2003, p. 91). In another study in New Jersey Megdal found no significant differences between the structures of

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[78] Measured by level of attainment, student academic performance, tests scores, etc.
[79] Using student-teacher ratios, teachers' salaries, workforce retention levels, etc as proxies
[80] Per student
[81] Per student

educational expenditure before and after the imposition of a binding spending limit (Megdal, 1986).

Some studies uncovered negative effects of TELs on school finances. For instance, Figlio determined that TELs were associated with larger student-teacher ratios, lower starting teachers' salaries[82]; and lower student performance[83], while administrative costs remained unaffected (Figlio, 1997, p. 245, 1998, p. 55).

In California, according to Fischel, local school funding has been displaced by state funds with subsequent reductions in educational quality (W. Fischel, 1989, 1996, 1998, 2005)[84]. Speich *et al* reported negative consequences of Proposition 13 on the resource base of the entire state's school system (Speich & Weiner, 1980).

In Massachusetts, Bradbury *et al* found a negative correlation between TELs and public schools enrollment (Bradbury, Case, & Mayer, 1998); while Burke described reductions in school budgets due to TELs (Burke, 1991). At least two studies reported increased inequality among school districts[85] within the same state (L. Buchanan, 1985; Winkler, 1979). In yet another study Downes attributed long-run reductions in the student performance to TELs (T. Downes, 1999, p. 113).

A number of studies yielded either mixed or ambiguous effects of TELs. For example, Holmstedt found that an Oregon tax limit increased student-teacher ratios, but left the ratio of administrative to educational spending unchanged, and concluded that the incidence of the tax limitation has been borne equally by instruction and administration (Holmstedt, 1952)[86].

Two studies concluded that, although TELs did not adversely affect school districts on the aggregate level[87]; some locally specific variables[88] were negatively affected (Powell, 1996; Tacker, 1985). In a related study on the effects of TELs on public tertiary education, Permaul found that the initial strongly negative effects of TELs on the public universities have been in the long run offset by state measures stabilizing financial support for state colleges (Permaul, 1985).

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[82] Adjusted to cost of living
[83] in mathematics, science, social studies and reading examinations
[84] However, one study challenges Fischel's premises with refuting empirical evidence (Stark & Zasloff, 2003)
[85] In per student expenditure
[86] Although this study may be dated
[87] In terms of the revenue generation capabilities, expenditure patterns, or revenue composition
[88] E.g.: wealth, percentage of state aid, and amount of commercial/industrial property within a district

In summary of this review several observations can be made. First and probably the most important is that despite continuing intense political and academic debate about suitability of tax and expenditure limitations as a public policy and regardless of conflicting results of the studies of their overall effectiveness as a tool of fiscal containment, tax and expenditure limitations have become ingrained in the very fabric of state and local public sector, and affect in one way or another virtually all of its functions.

Second, even considering a certain degree of inconsistency in research results; taken as a whole available evidence points in the direction of less democracy not more, especially on the local level. This is a direct and predicted consequence of centralization, erosion of home rule, increased fragmentation of local public sector and significantly diminished government transparency, accountability and responsiveness all driven by TELs.

Third, on the fiscal side of the question, tax and expenditure limitations have an effect on budget allocation, choice of revenues sources, total government spending and government efficiency. In many instances these effects have been problematic, or even detrimental to normal government operations.

Finally, tax and expenditure limitations have added an extra level of complexity to the state-local segment of government, and that to a significant degree contributed to suboptimal outcomes of the entire public sector making it less competitive, less innovative, and less governable, at least in the current political and economic environment.

PART II. STUDY OF ASYMMETRICAL FISCAL EFFECTS OF TAX AND EXPENDITURE LIMITATIONS ON LOCAL GOVERNMENTS IN METROPOLITAN AREAS

The second part of the dissertation is the empirical study of the effects of tax and expenditure limitations on the finances of local governments in the metropolitan areas of 48 contiguous United States. Specifically, this study examines using statistical methods the exact nature of the fiscal effects of tax and expenditure limitations on local governments located in the urban cores and suburban fringes of metropolitan areas.

This part of the dissertation consists of two chapters. Chapter 5 defines the principal research question, and describes the research methodology. Chapter 6 presents the detailed results of the empirical study, draws general conclusions, discusses the findings of the study in relation to prior research, discusses the contribution of this study, and offers suggestions for future research.

CHAPTER 5. RESEARCH QUESTION AND METHODOLOGY

This chapter connects the two parts of the dissertation – the theoretical and the practical. Thus, the chapter has three main objectives: first, identification of a gap in existing research on the fiscal effects of tax and expenditure limitations on local governments, second, formulation of the principal research question of the present empirical study and, third, the description of the research methodology.

The latter includes the characterization of the research sample, the sources of data, the definition of the primary unit of analysis, the explanation of specific statistical research techniques, and protocols used in the study, and also the delineation of the variables employed in this research.

5.1. Gap in Research and Principal Research Question

The review of empirical studies of the effects of fiscal limits on the one hand shows the diversity of existing research on the topic of TELs, and on the other hand it leads to the observation that despite significant research effort fiscal effects of TELs on the finances of local governments have not been investigated in their entirety, and some gaps in the knowledge still exist.

One such underexplored area is the relationship between the geographic location and the differences in the degree and nature of fiscal effects local governments experience in the presence of TELs. In general, the fiscal conditions of individual governments vary primarily due to specific revenue mixes and expenditure needs reflective of the resident populations they serve. As such, these variations are typically regarded as endemic and regular (Berne & Schramm, 1986; Blackely, 1994; R. Fisher, 1996; Hou & Moynihan, 2007; J. Mikesell, 1999; Musgrave & Musgrave, 1989; J Rabin, Barley, & Miller, 2000).

However, this naturally occurring variation can also be affected by other factors such as, for example, changes in legal framework limiting certain aspects of fiscal administration. In this regard, a number of recent studies pointed out that laws limiting taxes and expenditures not only make the differences in fiscal conditions of local governments more pronounced; but also that the fiscal effects of TELs vary considerably depending on the geographic location of local governments.

In particular, the study by Mullins empirically investigated the degree of variation of TELs effects across jurisdictions and populations. Mullins concluded that TELs did have significant substantive effects on the organization of local governments in metropolitan areas, on the packages of services they provide, and on the long-term mechanisms of government financing.

More importantly, Mullins concluded that "different types of limitations have different overall effects, which vary by spatial/structural position of the jurisdiction (urban core or suburban fringe); and with the relative prosperity of the community" (Mullins, 2004, pp. 145-146). These findings are consistent with Mullins' earlier conclusions that the imposition of TELs on local governments lead to "variability in the assignment of public service delivery responsibilities and differences in local fiscal capacities" (Mullins, 2001, pp. 9-10).

Similarly, a more narrow study by Hoene surveyed city officials' opinions on fiscal challenges to local budgets, and reported that fiscal conditions of urban governments under TELs vary by size and location. Specifically, city officials in cities under TELs were more likely to report poor fiscal conditions and less likely to report excellent fiscal conditions than officials from cities without limits.

Moreover, reports of poor fiscal conditions in the presence of TELs were more frequent in older less affluent post-industrial urban areas with shrinking population and declining economic base (Hoene, 2005). These latest findings are in line with the conclusions of a number of earlier studies, which investigated fiscal conditions of cities under limitations and reported analogous trends in urban finances (Hoene, 2000; K. Kim, 1992; M. Kim, 2006; C. Reid, 1988).

The study by Atkins *et al* assessed the revenue raising disparities of local governments in six[89] metropolitan areas and revealed substantial differences between local governments serving the urban cores and suburban fringes of metropolitan areas (Atkins, Curran, Bell, Wolman, & Cordes, 2005, pp. 37-38).

Although this research did not explicitly factor in fiscal limits *per se*, local general and special purpose governments in all 6 metropolitan areas of the sample operate under various, sometimes multiple, local TELs[90]. Therefore, the findings of this study may serve as indirect evidence that fiscal effects of TELs are conditional to the geographical position of local governments.

If placed in the broader context of past research on the subject of fiscal limits, the results of the above studies can serve as *de facto* demarcation boundaries of our current knowledge about the effects of tax and expenditure limitations on the finances of local governments. Additionally,

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[89] Baltimore, MD; Las Vegas, NV; Miami, FL; Milwaukee, WI; Richmond, VA; San Francisco, CA
[90] Refer to Appendix B

they can provide a valid referential point for the formulation of the principal research question of this dissertation. Based on available empirical evidence it is presently known that:

1) the imposition of statewide local TELs had an effect on local governments' finances;

2) different functional types of TELs cause different fiscal effects;

3) these effects were asymmetric, i.e. they depended on geographic position of local governments and the affluence of populations they serve, and finally;

4) in general, local governments located in the urban cores of metropolitan areas were more adversely affected by the imposition of local TELs than local governments serving suburban fringes of the metropolitan areas.

Consequently, although overall conclusions about the asymmetricity of the effects of TELs on local governments within metropolitan areas are generally clear, a more comprehensive investigation of these effects may be useful.
Therefore, for the purposes of this dissertation the following principal research question is warranted:

> ***What are the asymmetrical fiscal effects of tax and expenditure limitations on the local governments serving urban cores and suburban fringes of metropolitan areas?***

5.2. Research Focus

As it was mentioned above, local governments serving older urban core segments of metropolitan areas and less affluent populations were found to be more constrained than local governments located in the typically more prosperous suburban fringes. This asymmetricity across communities has not been investigated to the full extent, however, and merits attention.

From the substantive point of view, past research concentrated primarily on the examination of the effects of fiscal limits on the general measures, such as general revenues and general expenditures, and did not explore individual revenue categories such as own source revenues, intergovernmental transfers, user fees and charges.

Similarly, on the expenditure side, little attention has been paid to the investigation of the effects of TELs on the largest components of local government expenditure such as public education, health, police, fire, utilities, etc. Meanwhile, as it was reported in the literature review, some past studies indicated that fiscal effects of TELs may differ in these individual categories and may be indicative of the way local governments cope with the fiscal consequences of fiscal limits.

From the design perspective, most past studies examined differential effects of TELs by comparing fringe counties with limitations only to fringe counties without limitations, and urban core counties with TELs with urban core counties without TELs. Some studies also compared

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the fiscal effects of TELs in the urban core with the fiscal effects in the suburban fringe but did so by exploring only few selected financial indicators.

Therefore, taking into account the above points, this study approached the investigation of the principal research question by doing two things. First, it estimated the effects of TELs on the largest categories of revenue, mix of spending and debt levels of all local governments in the urban cores and suburban fringes of metropolitan areas, including the estimates for the jurisdictions experiencing fiscal stress. Second, it compared the effects in the cores of metropolitan areas with their fringes, and the differences in fiscal effects within these geographical segments.

Since this is an exploratory enterprise with the main objective to provide the detailed description of fiscal effects of TELs on the major revenue, expenditure and debt categories of local governments serving different geographic segments of metropolitan areas, the research hypotheses were operationalized as expected outcomes and as such were implied in the statistical analyses.

5.3. Research Methodology

As it was mentioned earlier, this study continues prior research efforts on asymmetrical fiscal effects of TELs on local governments with different spatial and socio-economic characteristics. In essence, it is a replication of several previous studies that empirically investigated similar questions. The difference of this research is that it is a more detailed descriptive examination of the effects of fiscal limits on particular segments of metropolitan areas.

Since the primary subject of this study has been generally investigated before, and because the research protocols used in the previous studies proved to be robust, reliable, but flexible enough to accommodate for alternating scopes of research, for all practical purposes, this dissertation relied on the research methodology developed by Mullins (Mullins, 2001; Mullins, 2004), and treated it as a standard framework.

In the theoretical literature the standard framework is defined as "a set of best practices expressed as repeatable processes created by an authoritative source in the respective field of study for descriptive or normative purposes" (Woodbridge, 2001, p. 17). The reliance on standard network as a methodological solution for research purposes is strongly supported by a number of authors (Alan & Peacock, 1969; Booth, Colomb, & Williams, 2003; Gill & Meier, 2000; Greene, 2002; Hsiao, 2003; Murphy & Myors, 2004; Schabenberger & Gotway, 2004).

Mullins' methodology relies on definitions and classification of TELs commonly accepted in the field of public finance, it combines research approaches from several relevant disciplines, and utilizes robust statistical supporting apparatus.

Most importantly, it met the immediate investigative needs of this study by allowing gradual implementation of research processes while at the same time permitting to start with those

procedures that demonstrate most value. Subsequent sections of this chapter describe the implementation of the standard methodology in this study.

5.3.1. Research Design

This study employed the quasi-experimental multiple comparison-group time series research design. It measured the fiscal outcomes associated with the imposition of TELs in several comparison groups over a period of time between 1972 and 2002. Relying on this design allowed making cross-section comparisons between metropolitan local governments in the states with and without fiscal limits.

Basically, this study compared fiscal outcomes at times and locations without TELs to the fiscal outcomes at times and locations where and when fiscal limits were present. Since this research design combines quasi experiments with time series, it also made possible comparing groups of local governments at the same time, while comparing individual local governments within these groups at different points in time.

Furthermore, the quasi-experimental nature of this design by default reduced selection threats to the minimum. The comparison groups were identified on the basis of externally existing determinant independent of the researcher. Thus, the dominant selection criterion for the comparison groups was the maximal permissible comparability of the correspondent units of analysis, except that some research subjects were operating under fiscal constraints while others were not at specific states and years of observation.

Specifically, this study made eight comparisons of the fiscal outcomes that can be statistically associated with the presence of tax and expenditure limitations. Four comparisons were implicit by the virtue of statistical analysis used in the study:

1) Urban core local governments with TELs *vs*. urban core local governments without TELs;
2) Suburban fringe local governments with TELs *vs*. suburban fringe local governments without TELs;
3) Fiscally stressed urban core local governments with TELs *vs*. fiscally stressed urban core local governments without TELs;
4) Fiscally stressed suburban fringe local governments with TELs *vs*. fiscally stressed suburban fringe local governments without TELs.

Four other comparisons evaluated the explicit post-test results in the specific observation pairs:
5) Urban core local governments with TELs *vs*. suburban fringe local governments with TELs;
6) Fiscally stressed urban core local governments with TELs *vs*. fiscally stressed suburban fringe local governments with TELs;
7) Urban core local governments with TELs *vs*. fiscally stressed urban core local governments with TELs;
8) Suburban fringe local governments with TELs vs. fiscally stressed suburban fringe local governments with TELs

The reliance on the quasi-experimental multiple comparison-group time series research design allowed to reduce existing threats to research validity without compromising measurement reliability. However, as with any other time series design, some threats to validity cannot be completely eliminated, specifically, regression to the mean, secular change, and multiple treatment inference. Nevertheless, they were acknowledged as such, and specific measures were taken to reduce the effects of these types of threats on various stages of this research.

5.3.2. Sources of Data and the Research Sample

All statistical data were obtained from the US Bureau of the Census in the form of Microsoft Access and Excel files. The data on the finances of local governments contained both absolute and per capita data on revenues, expenditures and debt. In approximately 123 or ($\approx$ 0.2%) of cases of observation per capita values were missing and were reconstructed from the absolute figures and population data for respective subjects of the sample and times of observation. Original data were collected on 13 control measures from which the remaining 4 control variables were constructed.

The selection of the research sample proceeded in several stages. First, 270 largest[91] metropolitan areas in the contiguous 48 United States were selected following the 2000 Office of Management and Budget (OMB) standard definition of metropolitan area[92]. Alaska and Hawaii were excluded due to their status of geographical outliers, peculiarities in the organization of local government and specificities of state and local finances, which all rendered them inappropriate for comparative purposes[93].

Second, since the focus of analysis of this study is on fiscal effects of TELs on local governments serving different geographic segments of metropolitan areas, the county area was selected as the unit of analysis (and Louisiana and New England county equivalents were used respectively). This decision was governed by the need to rely on the smallest geographic element containing required statistical information on all government authorities providing local services to individual local populations.

Third, the original sample was selected. It contained 793 metropolitan county areas constituting 270 largest metropolitan conurbations. Then, fiscal data were compiled individually for each subject for all units of local governments within 793 metropolitan county areas for the years between 1972 and 2002 inclusively. These were the years when the censuses of governments were conducted[94]. Altogether the sample contained 7 periods of observation at 5 year intervals of 793 metropolitan counties with the total number of observations $N = 166,530$.

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[91] In terms of the size of population based on the 2000 Census data (N=222,773,942; μ=831,246; x~=262,238; max=21,199,865; min=57,813).

[92] The OMB defines metropolitan statistical area as an area containing a recognized population nucleus and adjacent communities that have a high degree of integration with the nucleus (OMB, 2000, p. 82228)

[93] However, as of 2008 both have local TELs – AK has specific property tax rate and property tax revenue limits but does not have county governments, has boroughs instead, HI has full disclosure/truth in taxation requirements imposed on counties.

[94] 1972,1977, 1982, 1987, 1992, 1997, 2002

Fourth, all county areas in this original sample were sorted into either primary or non-primary. Primary counties (**P**) were defined as those containing the primary central core city of the metropolitan area. Then, by default, those counties, which do not contain the core city, were designated as non-primary (**NP**). At this stage, 48 metropolitan county areas were excluded from the sample, either because they were coterminous (completely within) core central cities,[95] or because they contained government structures functioning both as municipality and county with no true county governments[96]. After this sorting procedure the research sample contained 745 metropolitan counties areas, of which 227 were designated as primary and 518 as non-primary, thus forming two subsets.

Fifth, because TELs may have more significant negative effects on county areas with fewer relative fiscal resources, the sorting measure of the relative affluence of the county area (family poverty rate) was introduced. County areas with 2000 family poverty rates greater or equal to 110% of the average for all metropolitan counties in their respective state were designated as fiscally stressed. Then 227 primary and 518 county areas were sorted according to this criterion. As a result, 109 primary stressed (**SP**) and 139 non-primary stressed (**SNP**) county areas were identified, thus forming two additional subsets. As a result of these sorting procedures 4 subsets within the research sample were obtained:

1) Primary county areas (227 subjects; N=47,670);

2) Non-primary county areas (518 subjects; N=108,780);

3) Stressed primary county areas (109 subjects; N=22,890);

4) Stressed non-primary county areas (139 subjects; N=29,190).

Then, urban core local governments were operationalized as primary county areas, while suburban fringe local governments were operationalized as non-primary county areas. Stressed urban core local governments were operationalized as stressed primary county areas, and stressed suburban fringe local governments were operationalized as stressed non-primary county areas.

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[95] 5 NYC counties, 5 Philadelphia counties, 3 San Francisco counties, Suffolk (Boston) counties, Hudson county, NJ
[96] Mainly Virginia cities

5.3.3. Dependent Variables

The dependent variables of this study are the measures capturing the fiscal changes of local governments in metropolitan areas after the imposition of TELs. Eleven dependent variables were used in this study: four revenue variables, five expenditure variables, and four public debt variables. They are presented in the following table.

Table 2 - Dependent Variables

Dependent Variable	Description
Revenue Measures	
Total General Revenue per Capita	All revenues of local governments except utility, liquor store & insurance title revenue; include all tax revenue and intergovernmental transfers
Total Own Source Revenue per Capita	All revenues from the tax base of the jurisdiction except intergovernmental transfers
Total Intergovernmental Revenues per Capita	External transfers from other governments – federal and state; typically aid for education, social services, public works
Total General Fees & Charges per Capita	Revenues from user, regulatory, and other fees, charges and assessments.
Expenditure Measures	
Total General Expenditures per Capita	Combined general fund expenditure, not inclusive of debt, capital outlays and pension funds payments
Total Public Education Expenditures per Capita	Combined expenditures on public primary and secondary education in the jurisdiction
Total Social Services Expenditures per Capita	Constructed measure; combines original data on expenditures on social welfare, hospitals and health
Total Public Safety Expenditures per Capita	Constructed measure; combines original data on expenditures on police, fire protection and code enforcement
Total Public Works Expenditures per Capita	Constructed measure; combines original data on public utilities and sewer financed by local governments
Public Debt Measures	
Total Long-Term Debt Outstanding per Capita	All debt obligations of the issuing local government unit with maturity over 1 year; measures the general levels of cumulative indebtedness across all governments within metropolitan county areas.
Total Non-Guaranteed Long-Term Debt Outstanding per Capita	Limited liability debt of the issuing unit of government with maturity over 1 year
Total New Long-Term Debt Issued a Year	All new debt obligations issued within the fiscal year of observation
Ratio of Total Non-Guaranteed Long-Term Debt to Total Long Term Debt	Indicates the share of limited liability obligations compared to all debt obligation of an issuing local government

5.3.4. Independent Variables

The tax and expenditure limitations were the independent variable in this research project. As it follows form Chapter 1, TELs are a complex fiscal phenomenon with internal formal structure. The existence of the latter allows operationalization of the independent variable into the measures appropriate for statistical testing of the research hypotheses.

Following the standard methodology, three sets of models were used to detail the full extent of the fiscal effects of TELs. Each set was based on different representation of local TELs. Particular measures employed in each of the three sets of models reflected the existence of limits in the respective states and years of observation[97]. The data on currently active limitations were collected from a number of sources (Deller & Stallmann, 2006; Mullins, 2004; Mullins & Cox, 1995), and were verified through legislative research to make sure that the study relied on most current information.

The first set of models operationalizes the independent variable into either non-binding (**NBLIM**) or potentially binding (**PBLIM**). Such designation follows the Mullins-Cox-Joyce classification of limitations into functional types and the degree of their restrictiveness (Mullins & Cox, 1995; Mullins & Joyce, 1996). According to this typological approach, the non-binding (**NBLIM**) limitations comprise: 1) local overall property tax rate limits, 2) local specific property tax rate limits and 3) assessment increases limits.

The potentially binding (**PBLIM**) limitations include: 1) local property tax levy limits, 2) local general revenue limits, 3) local general expenditure limits and 4) limits on assessment increases, which are imposed simultaneously with either specific property tax rate limits or overall property tax rate limits. Each of the two categories of TELs corresponds to a dummy variable with values "1" for their existence and "0" for their absence in each state for each year of observation.

The functional type of full disclosure/truth in taxation TELs was excluded from all three sets of models because of its merely informative nature, and virtually non-existent probability that such TELs may have any measurable effects on the revenues, expenditures or the public debt of local governments in the sample. Several texts provide further support for such exclusion (Anderson, 2006; Deller & Stallmann, 2006; Hamill, 2007; McCabe & Feiock, 2000). Thus, the first set of models was used to investigate the fiscal effects of either the four potentially binding or the three non-binding TELs[98] on local governments in urban cores and suburban fringes of metropolitan areas.

The second set of models operationalizes the independent variable into two dummy variables as well. The first variable was designated as (**ANYLIM**). It reflects the existence of any functional type of limitations in the state, where individual metropolitan counties are located in the year of

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[97] It should be noted that all three sets of models are based on the assumption that within each model all TELs are homogeneous. That is, each model by default ignores the existing differences between individual limitations. The degree of stringency of TELs varies quite significantly even within the same functional type. For example, overall limitations on property tax rate vary from state to state by different allowable percentage levels. Nonetheless, the approximation of existing complexity is necessary for practical purposes of this research project.
[98] treated as non-discrete entities in this case

the cross sectional observation. It accounts for the existence of either a non-binding (**NBLIM**) or a potentially binding (**PBLIM**) limitation.

The second dummy variable (**BOTHLIM**) was introduced to detect the probable interactive effects of both potentially binding (**PBLIM**) and non-binding (**NBLIM**) limitations. The second set of models was used to explore the specific fiscal effects of the interaction of both binding and non-binding limitations on the local governments in metropolitan county areas of the sample.

The third set of models operationalizes the independent variable by disaggregating it into ten separate variables based on the functional classification of TELs:
1) (**UNILIM**) – reflecting the existence of limits universally applied across jurisdictions such as overall property tax rate limits, or limits on assessment increases that are applied simultaneously to counties, municipalities and school districts;
2) (**GPRATE**) – reflecting the existence of specific property tax rate limits on general purpose local governments (i.e. counties and municipalities);
3) (**GPLRE**) – capturing the effects of levy, revenue or expenditure limits on general purpose local governments (i.e. counties and municipalities);
4) (**GPLEVY**) – reflecting the existence of levy limits on general purpose local governments (i.e. counties and municipalities);
5) (**GPREV**) – reflecting the existence of revenue limits on general purpose local governments (i.e. counties and municipalities);
6) (**GPEXP**) – reflecting the existence of expenditure limits on general purpose local governments (i.e. counties and municipalities);
7) (**SCRATE**) – reflecting the existence of property tax rate limits on school districts;
8) (**SCLEVY**) – reflecting the existence of levy limits on school districts;
9) (**SCREV**) – reflecting the existence of revenue limits on school districts;
10) (**SCEXP**) – reflecting the existence of expenditure limits on school districts;

The third set of models was used to examine the specific fiscal effects of individual functional types of TELs on metropolitan local governments.

5.3.5. Control Variables

Following the standard methodology, for the purposes of increasing the internal validity of this study 17 control variables were used in the statistical models. The use of control measures was necessitated by the need to control for potential spurious correlations between the dependent and the independent variables. The former may arise due latent confounding effects of socio-demographic, economic, and organizational differences between individual subjects of the study.

The control variables used in this study can be classified into roughly three categories – 1) the measures of supply of government services, 2) the measures of demand for services, and finally, 3) the economic controls[99].

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[99] This study does not incorporate variables that control for political preferences of resident populations. Data paucity is the primary reason for their exclusion. However, political preferences are captured in part by per capita income, private school enrollment and poverty level control variables.

The supply measures control for the existing differences between the local governments of the sample in the scale of service delivery, concentration of cervices, population dynamic, and the age of infrastructure.

The demand measures isolate the effects of a variety of population characteristics, such as age, affluence of the residents, and the resulting varying service needs across local governments.

The economic controls account for the existing differences between the subjects due to the varying levels and structures of economic activity in the respective jurisdictions.

The need for these controlling parameters stems from the body of literature on expenditure determinants (Bergstrom & Goodman, 1973; Borcherding & Deacon, 1972; Pommerehne & Frey, 1976). The descriptions of the specific control variables are presented in the following table.

Table 3 - Control Variables

Control Variable	Description	Measure
Supply Controls		
POP1 Population	Measure of the total aggregate resident population served by the county area; a general indicator of the scale of service delivery responsibilities, existence of local economies of scale, labor market, supply cost structure and possible externalities.	Total number of residents in the year of observation
POP2 Population Squared	Integrates the non-linear effects of population size into the models; required because the linear relationship between population and the dependent variables may be distorted depending on the changes in the resident population.	
POP3 Population Density	Controls for the degree of congestion in the county areas as the former has unique effects on the costs and delivery of services.	Number of persons per 1 mile^2 of land area
POP4 Population Growth Rate	Captures the fluctuations in demand for public services during the periods of significant growth as service delivery requirements may differ between stagnant and vibrant environments.	Per cent for the period of observation
HZ1 Household Size	Controls for the fact that certain cervices are delivered to households instead of individuals, and separates the effects of concentration/ deconcentration of residents into households.	Number of persons per household in the year of observation
HZ2 Pre-1940 Housing Stock	Controls for the age of housing stock - an important determinant of service delivery costs and spending across jurisdictions	Per cent in the year of observation

Demand Controls		
POP5 Population <18	Controls for the level of dependent population, and the resulting service demands on county governments for educational, recreational, and other juvenile services.	Per cent in the year of observation
POP6 Population >65	Controls for the differences between jurisdictions due to service needs of the aged population, and the differences in the preferences for certain financing instruments this group of residents may exhibit.	Per cent in the year of observation
EDU Private School Enrollment	Controls for the differences between jurisdictions due to lesser demands for public educational services in locales with private alternatives for such services. Percentage of the total school enrollment in the elementary and secondary educational institutions.	Per cent in the year of observation
PCI Per Capita Income	Controls for the differences between jurisdictions due to the various levels of population prosperity.	Dollars
POV Poverty Level	Controls for the differences between jurisdictions arising from the service needs of poor population. Due to changes in the definitions of poverty status, revised US Census data were used. Percentage of families living in poverty in the jurisdiction.	Per cent in the year of observation
SSP Average Monthly Social Security Payment	Measures the income of senior residents, controls for the relative economic capacity of this group of population on the resource base and the demand for government services	Dollars per month per year of observation
DIV Diversity	Measures the diversity of the income distribution within individual county area; controls for differences in the demand for government services between jurisdictions due to income variation. Income homogeneity and greater demand for variation in government service levels usually correlate with higher levels of this measure. Calculated by weighting per capita income by jurisdiction's poverty rate.	Absolute figure
Economic Controls		
EMP1	Ratio of total employment in the county to the total county resident population; assesses service requirements to meet the needs of commuting employees and the infrastructure requirements of the employers. Greater demand for local services and greater relative resource capacity are associated with higher levels of this ratio.	Ratio
EMP2	Ratio of employment in manufacturing to total resident population; assesses infrastructure needs and wage levels associated with this sector.	Ratio
EMP3	Ratio of employment in retail trade to total resident population; assesses infrastructure needs and wage levels associated with this sector	Ratio
EMP3	Ratio of employment in services to total resident population; assesses infrastructure needs and wage levels associated with manufacturing sector	Ratio

All absolute income measures were adjusted for inflation using 2002 as the base year in order to remove distorting effects of the former. The last year of observation was selected following the common guidelines on panel data analysis (Beck, 1975; Hsiao, 2003; Markus, 1979)

5.4. Statistical Protocols

The effects on tax and expenditure limitations on the revenue, expenditure mixes, and debt of local governments serving urban cores and suburban fringes of metropolitan areas were investigated by estimating three different sets of models for each dependent variable. These three sets of models reflect the three different approaches to operationalization of TELs. Each individual model was estimated using pooled cross-sectional time series analytical procedures, where the independent variables and the derivatives of the control variables[100] were regressed against the dependent variables.

The statistical models follow the quasi-experimental multiple comparison-group time series design, in which the imposition of limitations in different states at different periods of observation represents the existence of multiple treatments, and where the absence of limitations in certain states during a subset of years and across all years in other states serves as the inherent control group[101].

Prior to running statistical models a variable reduction technique of principal component analysis (PCA) was applied to 17 control variables. This measure was necessary because the control variables were highly correlated. Its purpose was to create principal component scores, uncorrelated linear combinations of weighted control variables, and explain more efficiently the maximal amount of variance in this segment of the data (Jolliffe, 2002; J. Kim & Mueller, 1978). The size of each of the 4 subsets of this study well exceed the required validity minimum of at least 1000 observations necessary for conducting PCA (Alwin, 1973; Kline, 1993). The results of the principal component analysis are presented in **Appendix E**.

The control variables were standardized prior to running the procedure (mean = 0, standard deviation =1, all diagonals of the correlation matrix =1). The amount of variance explained is equal to trace of the matrix, i.e. sum of the diagonals of the decomposed correlation matrix. The number principal components extracted was equal to the number of control variables. The first principal component identified accounted for the most variance in the control data. Eigenvalues indicate the amount of variance explained by each principal component. Eigenvectors are the weights used to calculate component scores. The component score is a linear combination of

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[100] Principal component scores

[101] The study originally included lagged dependent variables (LDV) as a means of capturing dynamic effects of the imposition of TELs on local governments. However, the majority of models with LDV did not hold. Most problematic were the estimates of TELs effects on specific items of revenue and core components of expenditure, i.e. when the analysis moved beyond the estimation of the effects on general revenues and general expenditures. To address the issue the stationarity tests on each dependent variable were performed (The Hadri LM test with H$_0$ that all the panels are (trend) stationary, given the balanced panel). In 2 instances (User Fees & Charges and Public Works) the test results indicated nonstationarity of data, which in turn suggested that OLS with LDV were inappropriate. The remaining stationarity tests were inconclusive, except one. As a result, despite the best effort to resolve the issue, the author decided to leave the investigation of temporal effects of TELs for future research.

control variables weighted by eigenvectors. Principal component scores are uninterpretable, because they do not have any underlying constructs (Horst, 1963).

The number of principal components to retain is determined based on three criteria: 1) eigenvalue ≥1 – Kaiser criterion (Kaiser, 1958); 2) at least 2% of variance explained by specific principal component (Dunteman, 1989); and 3) cumulative proportion of variance explained at least 85% (Brown, 2006; Harville, 2008). All rotations are orthogonal; all loadings are equivalent to correlations between control variables and the principal components. The principal component scores were regressed as covariates of the independent variables in the models.

The specific statistical model utilized was a standard fixed effects least squares dummy variable model with constant slope coefficients and an intercept, which varies over subjects and periods of observation. This type of estimation model is generally regarded as appropriate for the panel data analysis, provided the results of specification tests are in its favor (Beck, 1975; Hsiao, 2003; Markus, 1979; Sayrs, 1989).

The fixed effects model was selected after performing exploratory Hausman specification tests. In this case, the null hypothesis was that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. In all cases, the differences were highly significant; therefore, the fixed effects model was preferred for all analyses. Altogether, 728 individual models were run in this study, 182 models in each of the 4 subsets of the sample.

Except for the estimates of the TELs effects on the ratios of Total Non-Guaranteed Long-Term Debt, all models have been estimated in exponential form. All dependent variables were transformed as their natural logarithms. Since the main objective of these analyses is to assess the impact of fiscal limits on service populations rather than geographic space, all dependent variables were also weighted by population density.

The results of the statistical analyses can be viewed as cautious estimates of the effects of fiscal limits on local governments serving urban cores and suburban fringes of metropolitan areas. As with any other approximation, it is difficult to establish an explicit causal link between the dependent and the independent variables, but since the analytical models account for most of the alternative explanations, the probability that the estimates reflect the factual scope and vectors of fiscal effects of TELs is high.

5.5. Limitations of the Study

The external validity of the findings of this study may have some limitations. One may be associated with its design. This is a study of local governments in metropolitan areas. By default, it focuses on either urban or suburban areas of large conurbations. Meanwhile, tax and expenditure limits are imposed by states on all local governments subject to constraints. Thus, the generalizability of findings on TELs effects in metropolitan areas to non-metro areas may encounter some difficulties.

Another limitation is the exclusion of a number of metropolitan county areas at the stage of sorting. Although this measure was certainly necessary in order to create a maximally balanced panel, the exclusion of these areas inevitably reduces the scope of analysis, although only slightly.

Finally, the findings of this study may be suffering from a possibility of multiple treatment interference. Although the probability of such an event is relatively low because the statistical models attempted to account for all plausible alternative explanations, nonetheless, such probability remains. In the 1970s and early 1980s a number of cities in the sample implemented the policy of so-called "planned shrinkage", withdrawing essential city cervices from neighborhoods suffering from urban decay. It may be possible that some of the effects captured in the analyses may in fact be the effects of this policy.

To sum it up, chapter 5 connects the theoretical and the practical parts of this dissertation. It identifies the gap in the extant research on the fiscal effects of tax and expenditure limitations on local governments.

Specifically that a more comprehensive descriptive investigation of asymmetric effects of TELs on local governments serving the urban cores and suburban fringes of metropolitan areas is required.

This chapter also presented the principal research question. It reflects the need to empirically investigate the exact nature of asymmetric fiscal effects in the selected groups of local governments.

Chapter 5 also described the research methodology including the design of the study, sources of data, research sample, and the variables employed in statistical analyses. The next chapter will present the results of the study.

CHAPTER 6. RESULTS AND ANALYSIS

This chapter presents the results of the empirical study of the fiscal effects of tax and expenditure limitations on local governments in the urban cores and suburban fringes of the largest metropolitan areas in the contiguous United States. It discusses the findings in the context of the extant literature on the topic of TELs, draws general conclusions, and offers suggestions for future research.

The results of the study cover the fiscal consequences of the fourth – the latest wave of fiscal constraints, and include the period between 1972 and 2002. The fiscal effects were estimated for all dependent variables in the four subsets of the sample: primary county areas, non-primary county areas, stressed primary county areas, and stressed non-primary county areas.

The estimates of the fiscal effects of TELs are reported for all 728 statistical models. Parameter estimates of individual principal component scores, estimates of cross-sectional effects, separate time series effects, models descriptions, and fit statistics are not reported due to extremely large size of SAS output.

Only those estimates of TELs effects are discussed in the subsequent sections that are statistically significant at $\alpha = 0.1$, 0.05, and 0.01 respectively. Statistical insignificance of other regression estimates implies that the effects of the independent variables on the dependent variables were no different than zero at specified confidence levels, and thus, they do not merit attention.

6.1. TELs Effects on Local Governments in Primary Counties Areas

6.1.1. Effects on Revenue

Table 4 presents the estimates of the fiscal effects of TELs on the categories of revenue of local governments serving resident populations in the primary county areas. As follows from the second column of the table, the imposition of non-binding limits resulted in approximately 1.2% decrease in the total general revenues. If both binding and non-binding limits are considered together, these negative effects become stronger, and amount to about 1.4% decrease in general revenues, which turned out to be highly significant statistically.

Table 4 - Revenue Effects of TELs in Primary Counties Areas

Primary County Areas (P)	REVENUES per CAPITA (Log Transformation, Density Weighted)			
	Dependent Variables			
Independent Variables	General	Own Source	Intergovernmental	Fees & Charges
NBLIM	-0.012*	-0.023^	-0.001	0.041*
PBLIM	-0.04	-0.001	-0.007	-0.03*
$\overline{R}^2$	0.93	0.95	0.95	0.92
N	1589	1589	1589	1589
ANYLIM	0.01	0.01	-0.009	0.02
BOTHLIM	-0.014^	-0.02^	-0.005	-0.011
$\overline{R}^2$	0.96	0.96	0.94	0.94
N	1589	1589	1589	1589
UNILIM	-0.04^	-0.06^	-0.008	0.04*
GPRATE	0.02*	0.02*	-0.003	0.3[]
GPLRE	-0.003	-0.09	0.02^	-0.02
GPLEVY	0.004	-0.006	0.02*	-0.031*
GPREV	0.01	-0.003	0.01	-0.01
GPEXP	-0.05^	-0.11^	0.031*	-0.011
SCRATE	-0.001	-0.021[]	0.02[]	0.034
SCLEVY	-0.02	-0.024	-0.01	0.06*
SCREV	-0.031	-0.04	-0.021	-0.04
SCEXP	-0.05^	-0.1^	0.023*	-0.011
$\overline{R}^2$	0.95	0.96	0.93	0.92
N	1589	1589	1589	1589
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01				

If TELs are applied universally across all local types of local governments, the effect becomes more pronounced - a highly significant 4% decrease in the amount of total general revenues. Similar picture emerges, if expenditure limits are imposed on either general or special purpose governments – highly significant ≈ 5% reduction in general revenues in both cases. One effect stands out, however, from this otherwise consistent picture – an existence of specific property tax rate limits on general purpose governments actually increases the amount of general revenues by about ≈ 2%.

The third column of the table presents the estimates of TELs effects on own source revenues. The effects are generally uniform across various sets of TELs models, and show overall decrease in reliance on own source revenues by local governments in this geographic segment of metropolitan areas. Especially pronounced are the negative effects of expenditure limits on

general purpose governments (≈ -11%) and school districts (≈ -10%). Similarly to the impact of TELs on general revenues, imposition of specific property tax rate limits results in ≈ 2% increase in own source revenues.

The negative effects of TELs on the two revenue categories above were somewhat balanced by the overall positive TELs effects on intergovernmental revenues. This category registers ≈ 2% increase associated with levy, revenue or expenditure limits on general purpose local governments or levy limits on the same type of local governments. More pronounced ≈ 3.1% increase is associated with the expenditure limits on general purpose governments. Increases associated with rate limits and expenditure limits on school districts were ≈ 2% and ≈2.3% respectively.

The last column of the table reports the estimates of the effects on general fees and charges. The picture here is mixed. Non-binding limits, universally applied limits, rate limits on general purpose governments, and levy limits are associated with increases in reliance on this revenue source, while the existence of potentially binding limits, levy limits on general purpose governments, and expenditure limits on school districts are associated with measurable reductions in revenues.

6.1.2. Effects on Mix of Spending

Table 5 presents the estimates of the effects of TELs on the mix of spending of local governments located in the primary county areas. As it follows from the second column, in general, tax and expenditure limitations are associated with overall decreases in the amount of general expenditures. Largest decreases are associated with either expenditure limits on general purpose governments (≈ 4.3%) and revenue limits on school districts (≈ 4%). Equally high and also highly significant was the impact of expenditure limits on school districts (≈ 3.7%).

Similar picture is observed with the effects of TELs on public education expenditures. In all, except one case, local governments serving primary county areas appear to decrease their educational spending. The largest decreases in this category (≈ 6%) were associated with the imposition of revenue limits on school districts. Only one estimate returned a positive coefficient of approximately 1.2% increase in public education spending. It is associated the existence of levy limits on general purpose governments.

The picture of TELs effects on social services expenditures (column 4) was mixed. Positive effects were associated with levy, revenue and expenditure limits, and levy limits on general purpose governments – of about 5% in both cases. Relatively large negative effects were associated with the existence of expenditure limits on general purpose governments (≈ -12.4%) and on school districts (≈ -13%).

Table 5 - Expenditure Effects of TELs in Primary Counties Areas

Primary County Areas (P)	EXPENDITURES per CAPITA (Log Transformation, Density Weighted)				
	Dependent Variables				
Independent Variables	General	Public Education	Social Services	Public Safety	Public Works
NBLIM	-0.013*	-0.022^	0.022	-0.007	0.047*
PBLIM	-0.005	-0.011^	0	0.005	-0.05^
$\overline{R}\,^2$	0.94	0.92	0.86	0.91	0.84
N	1589	1589	1589	1589	1589
ANYLIM	0.001	0.006	-0.03	-0.003	-0.01
BOTHLIM	-0.012^	0.029	0.024	0.002	-0.02
$\overline{R}\,^2$	0.91	0.93	0.88	0.89	0.86
N	1589	1589	1589	1589	1589
UNILIM	-0.034^	-0.034^	-0.04	-0.015*	-0.04*
GPRATE	0.004	0.01	0.1	-0.01	0.033
GPLRE	0	0.04	0.05*	0.002	-0.01
GPLEVY	0.006	0.012^	0.05*	0.004	-0.03
GPREV	0.005	-0.009	-0.007	-0.017	-0.02
GPEXP	-0.043^	-0.04^	-0.124^	-0.031^	0.056*
SCRATE	0	-0.007	0.044	-0.02[]	0.03
SCLEVY	-0.02	-0.02[]	-0.047	-0.03[]	0.09*
SCREV	-0.04*	-0.06^	-0.14	-0.051*	-0.06
SCEXP	-0.037^	-0.03^	-0.13^	-0.029^	0.05
$\overline{R}\,^2$	0.91	0.91	0.87	0.92	0.86
N	1589	1589	1589	1589	1589

"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01

As it follows from the fifth column of the table, the imposition of TELs was associated with overall decreases in local government spending on public safety. Especially pronounced was the decrease associated with the existence of revenue limits on school districts (≈ -5.1%) and expenditure limits on general purpose governments (≈ -3.1%) with the latter being highly significant.

Finally, as it follows from the results presented in the last column, non-binding limits were associated with approximately 4.7% increase in spending on public works, while potentially binding limits were associated with about 5% decrease in this category of spending. The effects of limits universally applied across local jurisdictions were also negative (≈ -4%). At the same time, expenditure limits on general purpose governments and levy limits on special governments

were associated with approximately 5.6% and a 9% increases in spending on this category of expenditure.

6.1.3. Effects on Debt

Table 6 presents the estimates of the effects of TELs on the level of debt of local governments serving primary county areas.

Table 6 - Debt Effects of TELs in Primary Counties Areas

Primary County Areas (P)	PUBLIC DEBT per CAPITA (Log Transformation, Density Weighted)			
	Dependent Variables			
Independent Variables	Total Long-Term Debt Outstanding	Non-Guaranteed Long-Term Debt Outstanding	Total New Long-Term Debt Issued/Year	Ratio of Non-Guaranteed LTD/Total LTD◊
NBLIM	0.1	0.112^	0.44	0.115^
PBLIM	-0.044^	-0.024	-0.1[]	0.01
$\overline{R}^2$	0.88	0.81	0.55	0.71
N	1589	1589	1589	1589
ANYLIM	0.012	0.1	0.1	0.031
BOTHLIM	-0.05^	0.013	-0.1*	0.06^
$\overline{R}^2$	0.87	0.80	0.55	0.72
N	1589	1589	1589	1589
UNILIM	-0.04*	0.16^	-0.07	0.11^
GPRATE	0.02	0.1	0.06	0.02
GPLRE	-0.062^	-0.1*	-0.083[]	0.03*
GPLEVY	0.01[]	-0.1	-0.05	0
GPREV	-0.08[]	-0.2*	-0.16	-0.03
GPEXP	-0.1^	-0.1^	-0.221*	0.1^
SCRATE	0.01	0.19^	0.12	0.12^
SCLEVY	0.002	0.18[]	0.016	0.11^
SCREV	-0.05	-0.14	-0.26	0.024
SCEXP	-0.08^	-0.6	-0.155[]	0.072^
$\overline{R}^2$	0.87	0.80	0.57	0.70
N	1589	1589	1589	1589
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01 ◊ - density weighted only, no log transformation				

Column two of the table reveals that in all cases, except one, the imposition of TELs was associated with measurable decreases in the total long-term debt outstanding. Particularly large decreases were associated with the existence of expenditure limits on school districts (about 8%), revenue limits on general purpose governments (about 8%) and levy, revenue and expenditure

limits on general purpose governments (≈ - 6.2%). However, when levy limits were imposed on general purpose governments, this measure was associated with about 1% increase in the amount of this category of debt.

The effects on non-guaranteed long-term debt outstanding were mixed. Some TELs were associated with increases, while other TELs with decreases in this category. In particular, the existence of non-binding limitations was associated with about 11.2% increase in the public debt of this kind. Even higher estimate of increases were returned for the existence of either rate (≈ 19%) or levy limits (≈ 18%) on school districts. At the same time, the existence of any potentially binding limit was associated with approximately 2.4% decrease in this kind of debt, approximately 10% decrease was associated with levy, revenue and expenditure limits on general purpose governments; while presence of revenue and expenditure limits on general purpose governments was associated with significant decreases in non-guaranteed debt.

Column four of the table presents the estimates of the TELs effects on new long-term debt issued. The results here are quite uniform. In general, the existence of fiscal limits was associated with overall decreases on the amounts of new debt issued. Particularly dramatic was the impact of expenditure limits on general purpose governments (≈ -22.1%) and expenditure limits on school districts (≈ -15.5%).

The last column of the table presents the estimates of the effects of TELs on the ratio of non-guaranteed long-term debt to total long-term debt. In nine instances, when the estimates turned out to be statistically significant, the estimates showed overall increases in the share of non-guaranteed long-term debt issued by local governments in the primary county areas. This means that these government units rely more frequently on non-guaranteed long-term debt as a source of financing. Consequently, local governments serving primary county areas are likely paying higher costs for alternative financing as the cost of borrowing under non-guaranteed conditions are higher.

Figure 12 - Fiscal Effects of TELs in Primary Counties Areas
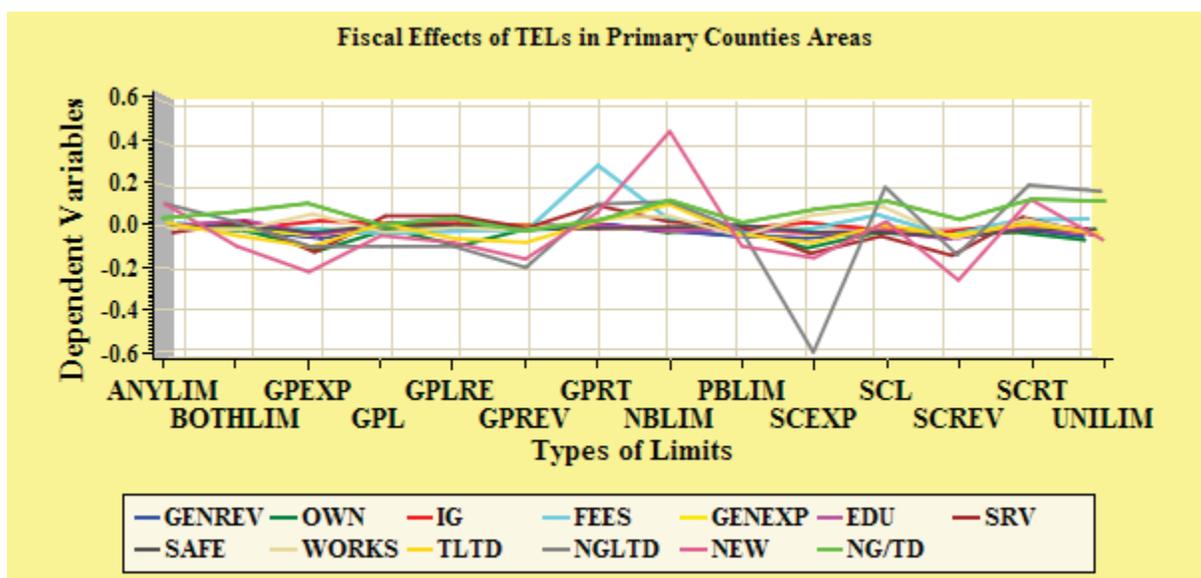
6.2. TELs Effects on Local Governments in Non-Primary Counties Areas

6.2.1. Effects on Revenue

Table 7 presents the results of analyses of the effects of TELs on the sources of revenue of local governments serving non-primary county areas. Column two of the table indicates that the amount of general revenues has declined, irrespectively of specific model of TELs used. Most significant declines were associated with universally applied limits (≈ - 4.1%) and expenditure limits on school districts (≈ 4%).

Table 7 - Revenue Effects of TELs in Non-Primary Counties Areas

Non-Primary County Areas (NP)	REVENUES per CAPITA (Log Transformation, Density Weighted)		
	Dependent Variables		
Independent Variables	General	Own Source	Intergovernmental	Fees & Charges
NBLIM	-0.002	-0.004	-0.002	0.004
PBLIM	-0.012^	-0.03^	0.01*	-0.03*
$\overline{R}^2$	0.93	0.94	0.92	0.88
N	3626	3626	3626	3626
ANYLIM	-0.002	-0.01	0.011[]	0.005
BOTHLIM	-0.013^	-0.03^	0.004	-0.021[]
$\overline{R}^2$	0.94	0.94	0.91	0.89
N	3626	3626	3626	3626
UNILIM	-0.041^	-0.07^	0.003	0
GPRATE	0.01	0.012	0.003	0.012
GPLRE	0.004	0	0.033^	-0.03*
GPLEVY	0	-0.025^	0.032^	-0.03*
GPREV	0.02	0.003	0.03*	-0.01
GPEXP	-0.034^	-0.1^	0.037^	0.003
SCRATE	-0.001	-0.031^	0.04^	0.003
SCLEVY	-0.03	-0.014	-0.06*	0.11[]
SCREV	-0.023	-0.04[]	0.003	-0.007
SCEXP	-0.04^	-0.1^	0.04^	-0.028
$\overline{R}^2$	0.92	0.94	0.95	0.87
N	3626	3626	3626	3626
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01			

Comparable changes were observed with regards to own source revenues (column 3). In general, the existence of TELs was associated with decreases in this category of revenues. The largest decreases are associated with expenditure limits on general purpose governments and school

districts (≈ -10%), and universally applied limits (≈ -7%). In all three cases, the estimates were highly significant. In the same fashion, potentially binding limits were associated with highly significant (≈ 3%) decrease in own source revenue, while the simultaneous existence of both binding and non-binding limits was associated with approximately 3% decrease in own source revenues. Levy limits on general purpose governments were associated with approximately 2.5% decreases. Rate and revenue limits on school districts were associated with approximately 3.1% and 4% decreases in own source revenues respectively.

A different vector of effects was observed with the effects of TELs on intergovernmental revenues. Except only in one case of approximately 6% reduction associated with levy limits on school districts, the effects were overall positive, which suggests that when faced with the declines in own source revenues, local governments in non-primary county areas compensated with increased reliance on subventions from other governments.

The effects of limits on fees and charges as a source of revenue were generally negative and ranged between about 2% to 3%. The only limit that was associated with positive estimates was levy limit on school districts. This effect turned out quite high – about 11%, but only moderately significant.

6.2.2. Effects on Mix of Spending

Table 8 presents the estimates of TELs effects on the items of expenditure of local governments serving non-primary county areas.

As it follows from column two of the table, the existence of tax and expenditure limits was associated with across the board decreases in the amount of general expenditures. Highly significant decreases were associated with the imposition of universally applied limits (≈ -5%), expenditure limits on school districts (≈ -5%), levy limits on school districts (≈ -4.1%), and expenditure limits on general purpose governments (≈ -4%). Potentially binding limitations are associated with approximately 1% decline in general expenditures, while simultaneous existence of non-binding and potentially binding limits was associated with the similar approximately 1% decline in general expenditures.

Likewise, the impact of TELs on public education appears to be generally negative across the board. In this category of expenditure, the imposition of non-binding limits was associated with highly significant approximately 1% decrease in spending. Not surprisingly, the highest decreases in educational spending were associated with revenue (≈ - 6%), expenditure (≈ - 4.1%) and levy (≈ - 4%) limits on school districts. Universally applied limits were associated with approximately 3.7% decreases in spending on public education. Revenue and expenditure limits on general purpose local governments were associated with approximately 2% and 4% decreases respectively.

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Table 8 - Expenditure Effects of TELs in Non-Primary Counties Areas

Non-Primary County Areas (NP)	EXPENDITURES per CAPITA (Log Transformation, Density Weighted)				
	Dependent Variables				
Independent Variables	**General**	**Public Education**	**Social Services**	**Public Safety**	**Public Works**
NBLIM	0.002	-0.01^	0.02	0.022*	0.121^
PBLIM	-0.01*	-0.004	0.06[]	-0.022^	-0.08^
$\overline{R}^{\,2}$	0.96	0.92	0.71	0.91	0.84
N	3626	3626	3626	3626	3626
ANYLIM	-0.001	-0.01	-0.001	0.004	0.08
BOTHLIM	-0.01*	-0.01	0.1^	-0.013*	-0.02
$\overline{R}^{\,2}$	0.96	0.91	0.73	0.93	0.87
N	3626	3626	3626	3626	3626
UNILIM	-0.05^	-0.037^	-0.06	-0.042^	-0.05[]
GPRATE	0.003	-0.004	0.08	0.023*	0.11^
GPLRE	0.005	0.003	0.09^	-0.001	-0.04*
GPLEVY	0.002	0.002	0.086^	-0.017*	-0.044^
GPREV	0.003	-0.02[]	-0.03	0.06^	0.042
GPEXP	-0.04^	-0.04^	-0.17^	-0.02	-0.007
SCRATE	0.001	0.01	0.08*	-0.021[]	0.1^
SCLEVY	-0.041^	-0.04*	-0.03	-0.061[]	0.05
SCREV	-0.03*	-0.06^	-0.17[]	0.032	0.062
SCEXP	-0.05^	-0.041^	-0.24^	-0.012	-0.03
$\overline{R}^{\,2}$	0.96	0.92	0.76	0.94	0.84
N	3626	3626	3626	3626	3626
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01					

The picture of the effects of TELs on social services expenditures was mixed, however. The existence of potentially binding limits was associated with about 6% increase in spending on this category. Simultaneous existence of both binding and non-binding limits was associated with highly significant 10% increase in spending on social services. The existence of levy, revenue or expenditure limits on general purpose and separate levy limits on general purpose governments as well as rate limits on school districts was associated with increased spending in this category. Three TELs appear to have negative effects – expenditure limits on general purpose governments (≈ - 17%), revenue limits (≈ - 17%) and expenditure limits (≈ - 24%) on school districts, the latter was quite large and highly significant.

The effects of fiscal limits on public safety were also mixed. While the existence of non-binding limits was associated with approximately 2.2% increase in spending on this category, the presence of potentially binding limits was associated with approximately 2.2% decrease in spending. Simultaneous existence of both binding and non-binding limits was associated with approximately 1.3% decrease in this expenditure category. Negative effects on public safety were also associated with universally applied limit ($\approx$ - 4.2%), levy limits on general purpose governments ($\approx$ - 1.7%), rate and levy limits on school districts ($\approx$ - 2.1% and - 6.1% respectively). Rate and revenue limits on general purpose governments were associated with about 2.3% and 6% increases in spending on public safety.

Finally, the last column of the table presents the estimates of TELs effects on public works. Here again, the picture is quite uneven. While non-binding limits were associated with approximately 12.1% increase in this spending category, potentially binding limits were associated with approximately 8% decline. The existence of universally applied limits was associated with roughly 5% decline in spending on public works. Levy, revenue and expenditure limits and single levy limits on general purpose governments were also associated with decreases in spending ($\approx$ - 4% and $\approx$ - 4.4% respectively). Rate limits on general purpose and school districts appear to boost spending on this category (with $\approx$ 11% and $\approx$ 10% growth correspondingly). In both cases the estimates were highly significant.

6.2.3. Effects on Debt

Table 9 presents the estimation of the effects of TELs on public debt of local governments serving non-primary county areas.

As we can see from the second column of the table, the existence of non-binding limits was associated with highly significant 15.3% increase in long-term debt levels. Potentially binding limits, however, were associated with a highly significant 6.9% decrease in this type of debt. Simultaneous existence of both limits was associated with highly significant approximately 4.2% decrease in long-term debt. Other limits associated with negative effects on long-term debt were: universally applied limits ($\approx$ - 5.7%); levy, rate and expenditure ($\approx$ - 5.1%), separate levy ($\approx$ - 5%), and expenditure ($\approx$ - 6.6%) limits on general purpose governments; as well as expenditure limits on school districts ($\approx$ - 7.2%). However, the imposition of rate limits on general purpose and special purpose governments was associated with positive effects of around 5.3% and 7.2% respectively.

With regard to non-guaranteed long-term debt, the existence of non-binding limits was associated with approximately 15.4% growth in this type of debt issued by local governments. Similar in sign effect of approximately 9% magnitude was associated with the existence of both binding and non-binding limits. Limits applied universally across jurisdictions were associated with approximately 13% increase; rate limits on school districts were associated with about 16.4% (and highly significant) increases in borrowing of this type. The only significant negative effect of about 8% was associated with the imposition on levy limits on general purpose governments.

Table 9 - Debt Effects of TELs in Non-Primary Counties Areas

Non-Primary County Areas (NP)	PUBLIC DEBT per CAPITA (Log Transformation, Density Weighted)			
	Dependent Variables			
Independent Variables	Total Long-Term Debt Outstanding	Non-Guaranteed Long-Term Debt Outstanding	Total New Long-Term Debt Issued/Year	Ratio of Non-Guaranteed LTD/Total LTD◊
NBLIM	0.153^	0.154^	0.211^	0.079^
PBLIM	-0.069^	-0.04	-0.179^	0.031^
$\overline{R}^2$	0.76	0.62	0.51	0.62
N	3626	3626	3626	3626
ANYLIM	-0.003	0.44	-0.07	0.063^
BOTHLIM	-0.042^	0.09[]	-0.04	0.037^
$\overline{R}^2$	0.78	0.64	0.51	0.62
N	3626	3626	3626	3626
UNILIM	-0.057*	0.13*	-0.189^	0.062^
GPRATE	0.053*	0.1[]	0.11	0.026
GPLRE	-0.051^	-0.06	-0.103*	0.023*
GPLEVY	-0.05^	-0.08*	-0.127^	0.015
GPREV	-0.015	-0.039	-0.04	0.006
GPEXP	-0.066[]	-0.06	-0.145	0.053[]
SCRATE	0.051[]	0.164^	0.114	0.066^
SCLEVY	-0.002	-0.003	0.049	0.147*
SCREV	-0.001	-0.05	-0.122	0.017
SCEXP	-0.072*	-0.1	-0.015	0.034
$\overline{R}^2$	0.77	0.62	0.50	0.62
N	3626	3626	3626	3626
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01 ◊ - density weighted only, no log transformation				

Column four of the table indicates that non-binding limits were associated with highly significant 21.1% increase in new long term debt. However, when only potentially binding limits are considered, they were associated with approximately 17.9% decrease in borrowing of this kind. In the same manner, universally applied limits; levy, revenue and expenditure limits; and levy limits on general purpose governments were associated with decreases in new issues of long-term debt.

Finally, similarly to the effects in the primary county areas, the estimates of TELs effects on ratio of non-guaranteed long-term-debt to total long-term debt indicate that local governments in this segment of metropolitan areas are increasingly relying on high-cost debt instruments to finance its services. This conclusion is based on the observation of generally positive estimates of the

effects. The effects of levy limits on this debt measure particularly stand out. These limits were associated with approximately 14.7% increase in the share of non-guaranteed debt.

Figure 13 - Fiscal Effects of TELs in Non-Primary Counties Areas
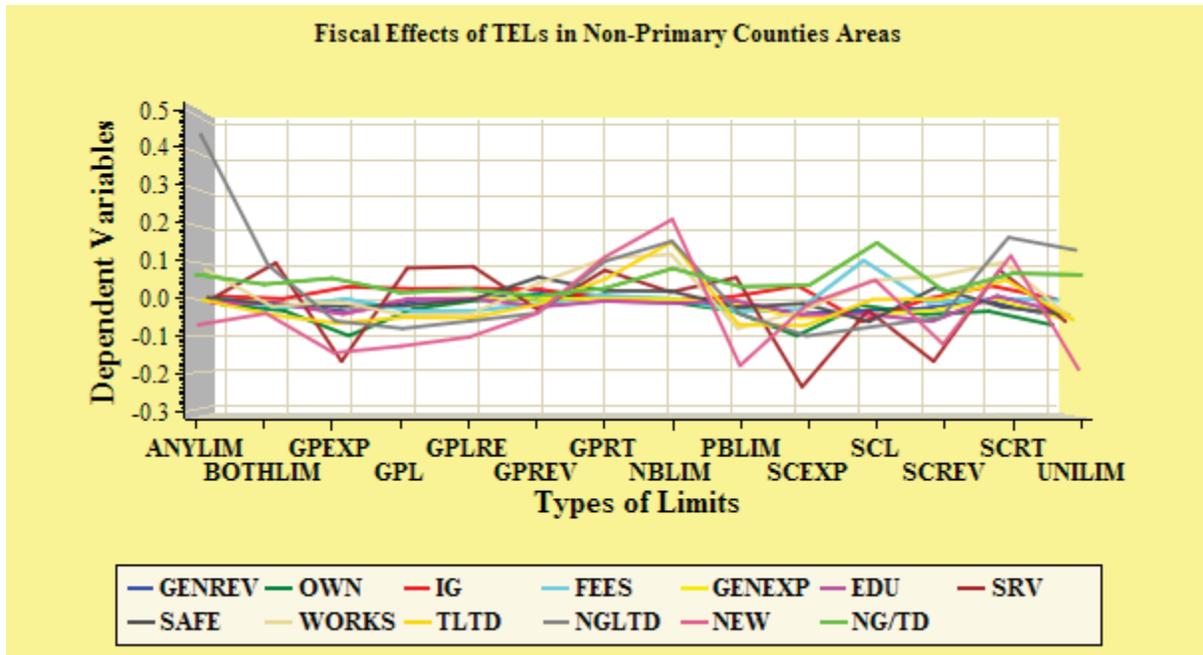
6.3. TELs Effects on Local Governments in Stressed Primary Counties Areas

6.3.1. Effects on Revenue

Table 10 presents the estimates of the effects of TELs on revenue categories of local governments serving stressed primary county areas. As it follows from column two of the table, the effects of TELs on general revenues were overall negative. They were fluctuating around approximately 3.5% decrease in this measure and in 3 out of four instances were highly significant statistically. Four functional types of TELs were associated with decreases in general revenues – universally applied limits, expenditure limits on general purpose local governments, levy limits, and expenditure limits on school districts.

The effects on own source revenues were also negative overall. The largest and highly significant decrease of approximately 10.5% was associated with the existence of expenditure limits on general purpose governments. The effects of expenditure limits on school districts were also relatively strong and highly significant. They amounted to approximately -9.5%. Universally applied limits yielded highly significant negative estimate of about 8.3%. The existence of non-binding limits was associated with a highly significant 3.5% reduction in own source revenues. Simultaneous existence of both binding and non-binding limits was associated with a smaller and less significant decrease of about 2.5%.

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Table 10 - Revenue Effects of TELs in Stressed Primary Counties Areas

Stressed Primary County Areas (SP)	REVENUES per CAPITA (Log Transformation, Density Weighted)			
			Dependent Variables	
Independent Variables	**General**	**Own Source**	**Intergovernmental**	**Fees & Charges**
NBLIM	-0.01	-0.035^	0.01	0.03
PBLIM	0.004	0.004	0.012	-0.01
$\overline{R}\,^2$	0.93	0.91	0.91	0.91
N	763	763	763	763
ANYLIM	-0.011	-0.025[]	0.01	-0.02
BOTHLIM	0.003	-0.002	0.012	0.01
$\overline{R}\,^2$	0.92	0.94	0.91	0.91
N	763	763	763	763
UNILIM	-0.035^	-0.083^	0.013	0.01
GPRATE	0.01	0	0.09	0.02
GPLRE	0.01	-0.12	0.03^	-0.023
GPLEVY	0.01	0.002	0.025^	-0.02
GPREV	0.01	0.003	0.004	0.03
GPEXP	-0.035^	-0.105^	0.034*	-0.01
SCRATE	-0.01	-0.045*	0.03[]	0.015
SCLEVY	-0.036[]	-0.07*	-0.02	0.032
SCREV	-0.02	-0.01	-0.052[]	0.09[]
SCEXP	-0.036^	-0.095^	0.02	-0.01
$\overline{R}\,^2$	0.97	0.96	0.97	0.92
N	763	763	763	763
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01				

With an exception of the effects of revenue limits on school governments (≈ - 5.2% decrease in intergovernmental revenues), the four other estimates of the effects on intergovernmental revenues were positive (column four of the table), especially in case of expenditure limits on general purpose governments (≈ 3.4%). In case of user fees and charges, only one estimate was significant - revenue limits on school districts were associated with approximately 9% increase in the usage of this revenue category by local governments.

6.3.2. Effects on Mix of Spending

Table 11 presents the estimates of the effects of fiscal limits on the mix of spending of local governments serving stressed primary county areas.

Table 11 - Expenditure Effects of TELs in Stressed Primary Counties Areas

Stressed Primary County Areas (SP)	EXPENDITURES per CAPITA (Log Transformation, Density Weighted)				
	Dependent Variables				
Independent Variables	**General**	**Public Education**	**Social Services**	**Public Safety**	**Public Works**
NBLIM	-0.013	-0.015	0.001	-0.17	0.021
PBLIM	0.01	0.014*	0.03	0.01	-0.034
$\overline{R}^2$	0.94	0.93	0.88	0.93	0.89
N	763	763	763	763	763
ANYLIM	-0.01	0.005	-0.13^	-0.013	-0.03
BOTHLIM	0.004	0.006	0.1^	0.01	-0.02
$\overline{R}^2$	0.95	0.95	0.91	0.93	0.91
N	763	763	763	763	763
UNILIM	-0.03^	-0.03^	-0.08[]	-0.02[]	-0.024
GPRATE	0.004	0.002	0.09^	-0.014	-0.011
GPLRE	0.01	0.01	0.07*	0	-0.012
GPLEVY	0.01	0.014*	0.04	0.01	-0.018
GPREV	0.01	-0.03	-0.1	-0.02	-0.01
GPEXP	-0.04^	-0.029*	-0.05	-0.05^	0.06
SCRATE	-0.01	0.004	-0.08	-0.032[]	-0.07
SCLEVY	-0.04[]	-0.03*	-0.08	-0.054*	0.05
SCREV	-0.033	-0.08^	-0.01	-0.01[]	-0.04
SCEXP	-0.04^	-0.022	-0.121*	-0.05^	0.043
$\overline{R}^2$	0.97	0.97	0.87	0.97	0.90
N	763	763	763	763	763
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01					

As we can see from column two of the table, TELs overall are associated with highly significant decreases in general spending. The magnitude of the decrease fluctuates around approximately -4%. Universally applied limits (≈ - 3%); expenditure limits on general purpose governments (≈ -4%); levy (≈ - 4%) and expenditure limits (≈ - 4%) on school districts were associated with these decreases.

The effects on educational spending (column three of the table) were for the most part negative. The largest and highly significant decrease (≈ 8%) in this expenditure category was associated

with revenue limits on school districts. Other TELs with negative effects included universally applied limits (≈ - 3%); expenditure limits on general purpose governments (≈ - 2.9%); levy limits on school districts (≈ -3%). At the same time, potentially binding limits are associated with a moderately significant 1.4% increase in school spending by local governments. General purpose levy limits are associated with approximately 1.4% growth in spending on public education

The effects of TELs on social services were mixed (column four of the table). The existence of any limit was associated with highly significant decrease of about 13% in this spending category. In contrast, if both binding and non-binding limits were in existence, this was associated with approximately 10% increase in spending on social services. The effects of universally applied limits were somewhat milder, and amounted to a decrease of about 8%. Imposition of rate limits on general purpose local governments was associated with highly significant 9% increase in spending. The existence of levy, rate and expenditure limit on general purpose governments was associated with about 7% increase in spending on social services. However, the imposition of expenditure limits on school districts resulted in approximately 12.1% decrease in social services spending.

As we can see from the next columns of the table, the effects of TELs on public safety expenditure were negative across the board with the largest decrease associated with levy limits on school districts (≈ - 5.4%). Other TELs that had significant effects on this spending category were universally applied limits (≈ - 2%); expenditure limits on general and special purpose governments (≈ - 5% each, both highly significant); rate limits on school districts (≈ - 3.2%), and revenue limits on school districts (≈ - 1%).

The estimates of the effects of TELs on public works expenditures did not return any significant coefficients.

6.3.3. Effects on Debt

Table 12 presents the estimates of TELs effects on public debt of local governments serving resident populations in the stressed primary county areas. As it follows from column two of the table, the effects of TELs on long-term debt were generally negative. Levy limits on school districts were associated with about 14.4% decrease in this category of debt. Next largest decrease was associated with expenditure limits on general purpose governments (≈ - 10%). Levy, revenue and expenditure limits on general purpose governments were associated with approximately 5.1% decrease, while expenditure limits on school districts were associated roughly 8.3% decrease.

The effects of TELs on non-guaranteed long-term outstanding were mixed. While universally applied limits were associated with approximate 10.2% increase in this kind of debt, expenditure limits on general purpose and special purpose governments were associated with relatively sizable decreases in the usage of this debt instrument – 12.4% and 14.8% respectively. Only two estimates of the effects of TELs on total new long-term debt issued were significant and both negative. Expenditure limits on general purpose governments were associated with a

large approximately 36% decrease, while expenditure limits on school districts were associated with approximately 29% decrease in the amount of new long-term debt issued.

Table 12 - Debt Effects of TELs in Stressed Primary Counties Areas

Stressed Primary County Areas (SP)	PUBLIC DEBT per CAPITA (Log Transformation, Density Weighted)			
	Dependent Variables			
Independent Variables	**Total Long-Term Debt Outstanding**	**Non-Guaranteed Long-Term Debt Outstanding**	**Total New Long-Term Debt Issued/Year**	**Ratio of Non-Guaranteed LTD/Total LTD$^\diamond$**
NBLIM	0.012	0.05	0.052	0.03
PBLIM	-0.015	0.013	0.01	0.01
$\overline{R}^2$	0.86	0.84	0.58	0.71
N	763	763	763	763
ANYLIM	0.032	-0.01	0.157	-0.06[]
BOTHLIM	-0.021	0.037	-0.027	0.044*
$\overline{R}^2$	0.85	0.85	0.58	0.72
N	763	763	763	763
UNILIM	-0.011	0.102[]	-0.09	0.07*
GPRATE	0.01	0.013	-0.013	-0.02
GPLRE	-0.051*	-0.044	-0.023	0.014
GPLEVY	0.03	-0.03	0.03	0.01
GPREV	-0.01	-0.02	-0.144	0.03
GPEXP	-0.1*	-0.124[]	-0.36*	-0.01
SCRATE	-0.022	0.08	0.06	0.06
SCLEVY	-0.144*	-0.14	0.01	0.012
SCREV	0.005	0.054	-0.25	0.09
SCEXP	-0.083*	-0.148[]	-0.29[]	-0.04
$\overline{R}^2$	0.87	0.82	0.57	0.71
N	763	763	763	763
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01				
$\diamond$ - density weighted only, no log transformation				

Column five of the table presents the estimates for the effects of TELs on ratio of non-guaranteed long-term debt to total long term debt. In this case, only the existence of any kind of limit was associated with approximately 6% decrease in this ratio. The simultaneous existence of both non-binding and binding limits was associated with approximately 4.4% increase in this ratio. Universally applied limits were associated with about 7% increases in this ratio.

Figure 14 - Fiscal Effects of TELs in Stressed Primary Counties Areas
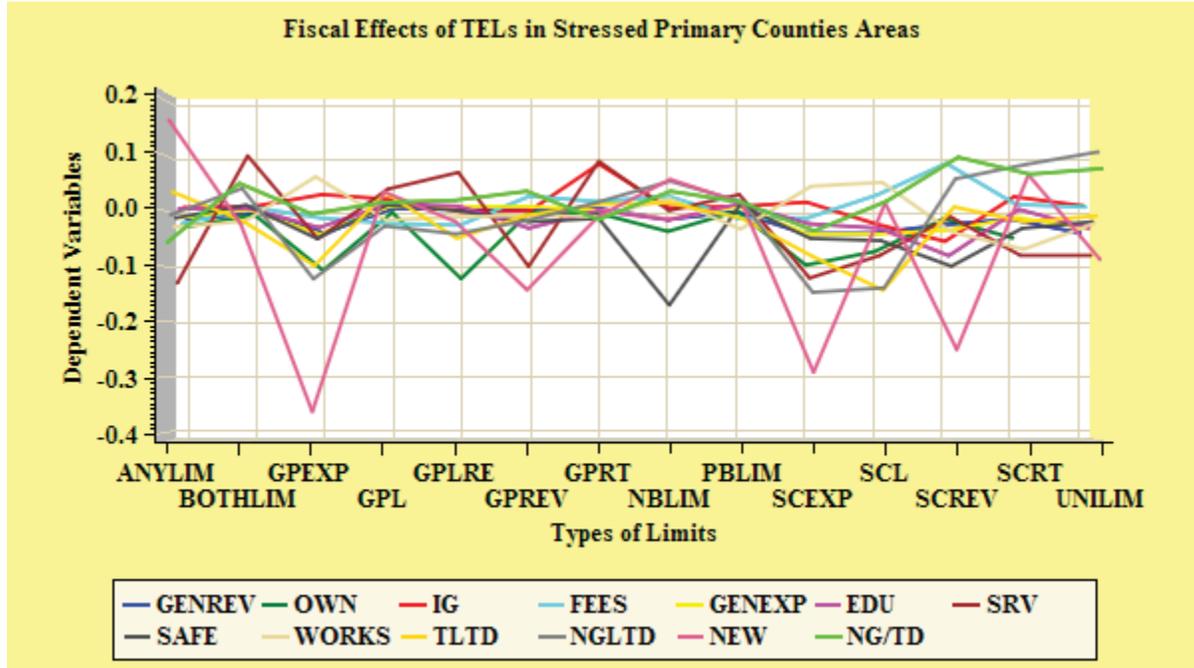
6.4. TELs Effects on Local Governments in Stressed Non-Primary Counties Areas

6.4.1. Effects on Revenue

Table 13 presents the estimates of the effects of tax and expenditure limits on the revenue categories of local governments serving stressed non-primary county areas. As we can see from column two of the table, the overall effects were negative. Potentially binding limits are associated with approximately 2.5% highly significant decrease in general revenues. The impact of other types of TELs is uneven, however. In particular, while expenditure limits on school districts are associated with approximately 5.4% decrease in general revenues, TELs on general purpose governments were less pronounced. Their effects were ranging from approximately -1.7% for levy, rate and expenditure limits to approximately 2% for single levy limits. However, the effects of the former were highly significant.

The effects of fiscal limits on own source revenue were again generally negative (column 3 of the table). The existence of potentially binding limits was associated with highly significant 5% decrease in this revenue category. When both non-binding and potentially binding limits were present, their effects were associated with highly significant decreases of about 4.1%. Universally applied limits; general purpose levy, revenue and expenditure limits; general purpose levy limits were each associated with highly significant decreases in own source revenues of about 5%. Finally, two moderately significant coefficients were associated with general purpose expenditure limits (≈ -10%) and school districts expenditure limits (≈ - 9.5%).

Table 13 - Revenue Effects of TELs in Stressed Non-Primary Counties Areas

Stressed Non-Primary County Areas (SNP)	REVENUES per CAPITA (Log Transformation, Density Weighted)			
	Dependent Variables			
Independent Variables	**General**	**Own Source**	**Intergovernmental**	**Fees & Charges**
NBLIM	0.002	0.014	-0.01	-0.04
PBLIM	-0.025^	-0.05^	0.017*	-0.053*
$\overline{R}^2$	0.92	0.94	0.84	0.86
N	973	973	973	973
ANYLIM	-0.019	-0.006	-0.029	-0.05
BOTHLIM	-0.015	-0.041^	0.02*	-0.002
$\overline{R}^2$	0.91	0.93	0.83	0.84
N	973	973	973	973
UNILIM	-0.02	-0.05^	0.012	-0.002
GPRATE	-0.004	0.012	-0.017	-0.001
GPLRE	-0.017^	-0.052^	0.028^	-0.06*
GPLEVY	-0.02[]	-0.05^	0.029^	-0.06*
GPREV	0.01	0.039	-0.01	-0.09
GPEXP	-0.04	-0.1*	0.05[]	-0.041
SCRATE	0.001	-0.015	0.015	0.019
SCLEVY	-0.03	-0.052	-0.027	0.011
SCREV	0	0.001	0	0
SCEXP	-0.054[]	-0.095*	0.033	-0.011
$\overline{R}^2$	0.91	0.94	0.86	0.86
N	973	973	973	973
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01				

The effects on intergovernmental revenues were positive across the board, which suggests that local governments in this group have become more reliant on external revenue sources. The existence of potentially binding limits was associated with about 1.7% increase in this revenue category. Similarly, when both types of limits are present, they were associated with approximately 2% increase in intergovernmental revenues. General purpose TELs were associated with highly significant increases of about 2.8% (general purpose levy, rate and expenditure limits), approximately 2.9% (general purpose levy limits) and moderately significant approximately 5% increases (general purpose expenditure limits).

Finally, the effects of TELs on fees and charges were overall negative. The existence of potentially binding limits was associated with about 5.3% decrease in this revenue category; while general purpose levy, revenue and expenditure limits and single general purpose levy limits were associated with about 6% decrease in this source of revenue each.

6.4.2. Effects on Mix of Spending

Table 14 presents the estimates of the effects of tax and expenditure limits on the expenditures of local governments serving stressed non-primary county areas.

Table 14 - Expenditure Effects of TELs in Stressed Non-Primary Counties Areas

Stressed Non-Primary County Areas (SNP)	EXPENDITURES per CAPITA (Log Transformation, Density Weighted)				
			Dependent Variables		
Independent Variables	**General**	**Public Education**	**Social Services**	**Public Safety**	**Public Works**
NBLIM	0.008	0.007	-0.05	0.02	0.1[]
PBLIM	-0.009	-0.001	0.013	-0.016	0.07*
$\overline{R}^2$	0.81	0.73	0.92	0.93	0.84
N	973	973	973	973	973
ANYLIM	-0.012	-0.02*	-0.06	0.002	0.05
BOTHLIM	-0.006	0.012	0.03	-0.012	-0.05
$\overline{R}^2$	0.81	0.74	0.92	0.94	0.84
N	973	973	973	973	973
UNILIM	-0.03[]	-0.02	-0.06	-0.03	-0.1
GPRATE	-0.001	-0.007	0.02	-0.001	0.1[]
GPLRE	-0.003	0	-0.001	-0.03*	-0.5
GPLEVY	-0.004	0	0	-0.03*	-0.05
GPREV	0.006	0.05	-0.1	-0.23	0.03
GPEXP	-0.004	-0.02	-0.08	-0.21	0.04
SCRATE	0.004	-0.01	0.07	-0.3	0.14*
SCLEVY	-0.045	-0.013	-0.1	-0.1	-0.16
SCREV	0	0	0	0	0
SCEXP	-0.053*	-0.01	-0.02	-0.03	0.002
$\overline{R}^2$	0.79	0.72	0.91	0.94	0.83
N	973	973	973	973	973
"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01					

The effects of TELs on general expenditures of this group of local governments were overall negative. Universally applied limits were associated with approximately 3% decrease in general expenditures. Expenditure limits on school districts we associated with slightly larger decreases of about 5.3%.

In case of spending on public education, only the existence of either non-binding or potentially binding limits was associated with any significant changes in this spending, they decreased it by

about 2%. The effects on social services were generally insignificant. Only two limits – general purpose levy, revenue and expenditure limits and general purpose levy limits – were associated with statistically significant decreases in public safety spending, each about 3%.

Finally, the effects on public works spending were positive across the board. Non-binding limits were associated with approximately 10% increase in this category of spending, while potentially binding limits were associated with approximately 7% increases. Two rate limits – general purpose and special purpose – were associated with respectively about 10% and about 14% increases in public works spending each.

6.4.3. Effects on Debt

Table 15 presents the estimates of the effects of tax and expenditure limits on the levels of public debt of local governments serving stressed non-primary county areas. As we can see from the second column of the table, the existence of non-binding limits was associated with about 12% increase in total long-term debt.

However, if potentially binding limits were present; this was associated with about 10% decrease in this debt measure. General purpose levy, revenue and expenditure limits were associated with about 10% decrease in this category of debt. General purpose levy limits had similar results in terms of vector and impact. General purpose expenditure limits were associated with approximately 26% decrease in accumulation of long-term debt.

Column three of the table presents the estimates of the effects of TELs on non-guaranteed long-term debt. The results in this category are mixed. The existence of non-binding limits was associated with approximately 26% increase in the usage of non-guaranteed debt.

At the same time, if either non-binding or binding limits were present, this increase was mildly reduced to about 23%. General purpose levy, revenue and expenditure limit was associated with about 13% decrease in non-guaranteed debt. General purpose expenditure limits appear to decrease the usage of non-guaranteed debt quite sizably – by approximately 54%, although this estimate is only moderately significant.

The effects of TELs on new long-term debt issued were significant only in case of universally imposed limits. They were associated with approximately 47% reduction in this debt measure. Finally, the effects of TELs on ratio of non-guaranteed long-term debt to total long-term debt were positive, when either potentially binding limits ($\approx$ 5% increase) or any kind of limits ($\approx$ 1% increase) were present.

Table 15 - Debt Effects of TELs in Stressed Non-Primary Counties Areas

Stressed Non-Primary County Areas (SNP)	PUBLIC DEBT per CAPITA (Log Transformation, Density Weighted)			
	Dependent Variables			
Independent Variables	**Total Long-Term Debt Outstanding**	**Non-Guaranteed Long-Term Debt Outstanding**	**Total New Long-Term Debt Issued/Year**	**Ratio of Non-Guaranteed LTD/Total LTD◊**
NBLIM	0.12*	0.26*	0.15	0.1
PBLIM	-0.1*	-0.07	-0.11	0.05[]
$\overline{R}$ ²	0.75	0.66	0.48	0.56
N	973	973	973	973
ANYLIM	0.05	0.23*	-0.09	0.01^
BOTHLIM	-0.1	-0.08	-0.17	0.03
$\overline{R}$ ²	0.74	0.67	0.49	0.56
N	973	973	973	973
UNILIM	-0.1	-0.07	-0.47*	0.02
GPRATE	0.03	0.12	0.07	-0.001
GPLRE	-0.1*	-0.13[]	-0.05	0.014
GPLEVY	-0.1*	-0.12	-0.04	0.02
GPREV	-0.11	-0.2	-0.39	-0.04
GPEXP	-0.26[]	-0.54*	-0.2	-0.01
SCRATE	0.52	0.19	0.04	0.05
SCLEVY	0.41	0.23	0.3	0.08
SCREV	0	0	0	0
SCEXP	-0.19	-0.46	-0.16	-0.1
$\overline{R}$ ²	0.72	0.67	0.48	0.56
N	973	973	973	973

"[]" = p-value of ≤ 0.10; "*" = p-value of ≤ 0.05; "^" = p-value of ≤ 0.01
◊ - density weighted only, no log transformation

Figure 15 - Fiscal Effects of TELs in Stressed Non-Primary Counties Areas
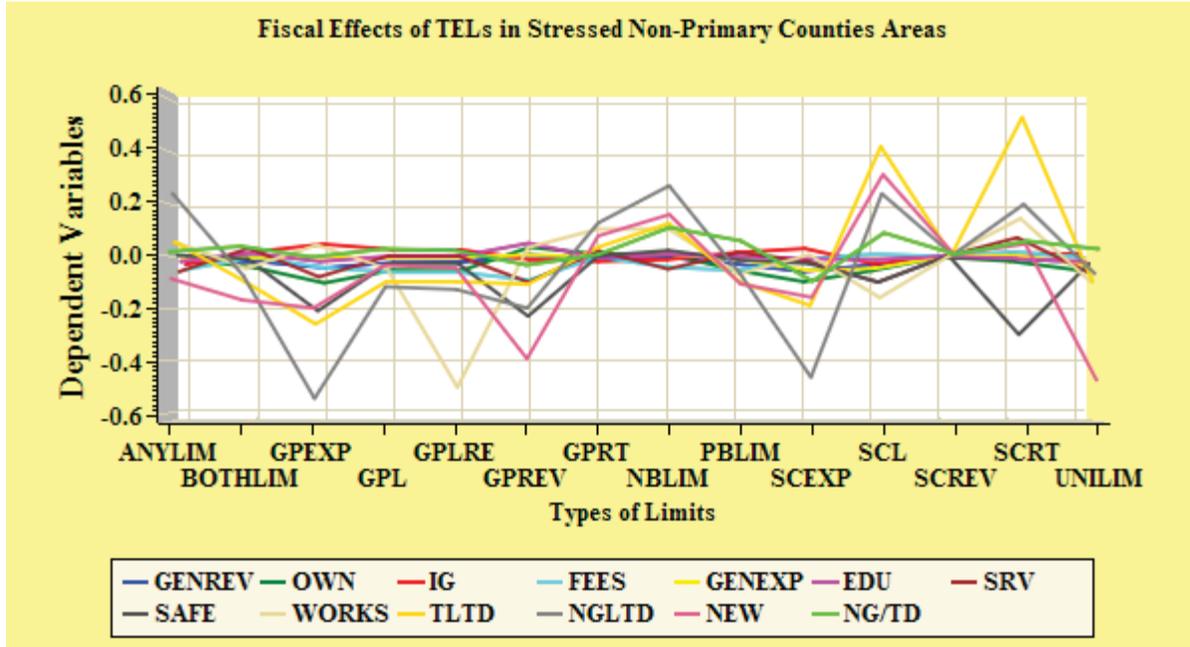
6.5. General Conclusions

The preceding sections of this chapter presented the estimates of the fiscal effects of tax and expenditure limitations on local governments situated in different geographic segments of metropolitan areas. The principal research question of this dissertation is "what are the asymmetrical fiscal effects of tax and expenditure limitations on the local governments serving urban cores and suburban fringes of metropolitan areas?"

The principal research question is addressed by examining the effects of the imposition of various tax and expenditure limitations on principal items of revenue, largest components of expenditure, and levels of public debt in four groups of local governments.

The focus of the analyses is on: 1) general and special purpose local governments serving primary counties areas, 2) general and special purpose local governments serving non-primary counties areas, 3) general and special purpose local governments in the primary counties areas experiencing fiscal stress, and 4) general and special purpose local governments in the non-primary counties areas experiencing fiscal stress.

The four comparison groups reflect the operationalization of general and special purpose local governments serving respectively: 1) urban cores, 2) suburban fringes, 3) fiscally stressed urban cores, and 4) fiscally stressed suburban fringes of metropolitan areas. This section will discuss the findings of the study in the context of past research, and will draw general conclusions.

Past comprehensive studies of local governments operating under various tax and expenditure limitations have found that, in general, imposition of local TELs led to more centralized local public sector (Dye & McGuire, 1997; Joyce & Mullins, 1991), significantly diminished local fiscal flexibility (J. Mikesell, 1986, 1993) and eroded local autonomy (Hoene, 2004; A. Sokolow, 1998; A. Sokolow, 2000).

Specific fiscal effects of TELs on local governments included:

1) overall reduction in the level of general revenues and expenditures (Merriman, 1983, 1987; Shadbegian, 1999; Skidmore, 1994);
2) increased reliance on state and federal fiscal aid in the form of direct intergovernmental revenues (DeTray, Fernandes, Pascal, & Caggiano, 1981; Lyons & Lav, 2007; Menchik, Fernandes, & Caggiano, 1982);
3) decreased reliance on own source revenue and increased dependence on non-tax sources of revenue, especially user fees and charges (McCabe, 1997; McCabe & Feiock, 2000; Raimondo, 1983);
4) general reductions in spending on core public services such as education, social services, public safety, and public works. (Duncan & Smith, 1995; Merriman, 1986, 1987; Zax, 1989);
5) increases in overall debt burden, especially in non-guaranteed long-term debt (Bennet & Dilorenzo, 1982; Krol, 1997).

This dissertation investigated whether the same trends are present in the four comparison groups of the sample. Table 16 presents the summary of the findings.

The study confirmed the existence of only some fiscal trends identified by past research.

With regard to the effects of tax and expenditure limitations on principal items of revenue, the results of the analyses indicate that all four groups of local governments in the sample experienced overall declines in the levels of general revenues in the presence of TELs. However, both general and special purpose local governments serving urban cores of metropolitan areas experienced larger declines compared to local governments in the suburban fringes. Thus, these findings are consistent with the results of past research.

The same conclusion can be reached about own source and intergovernmental revenues. This research has found that local governments in all four groups of the sample decreased their reliance on own source revenues, while simultaneously increasing fiscal dependence on intergovernmental revenues. Similarly to the situation with general revenues, urban core and fiscally stressed urban core general and special purpose local governments experienced somewhat larger declines in own source revenue, which coincided with larger increases in intergovernmental revenues.

Contrary to the findings of past research about the increasing role of non-tax sources of revenue in local governments' finances, this study did not find that this item of revenue grew in importance in all comparison groups of the sample. In particular, the situation with user fees and charges, one of the most important sources of non-tax revenues, varied among different groups

of local governments. The only group where the imposition of tax and expenditure limitations was associated with increases in this source of revenue was fiscally stressed urban cores of metropolitan areas. Fiscally stressed suburban fringes actually decreased their reliance on user fees and charges. The picture was generally mixed in both urban cores and suburban fringes of metropolitan areas, and varied by specific types of TELs.

On the whole, these findings suggest that local governments in different geographic segments of metropolitan areas used different coping mechanisms when their revenues were constrained by the imposition of limits. The most common vehicle here was the revenue substitution. Its primary vector allowed local governments to compensate the declines in own source revenues with the increases in intergovernmental revenues, mainly in the form of transfers from state governments. In those instances where the amount of substituting revenue was not sufficient to maintain the level of services required by local populations, the shortfalls were covered by increased use of user fees and charges.

Table 16 - General Fiscal Trends Associated with TELs

	Urban Core	Suburban Fringe	Stressed Urban Core	Stressed Suburban Fringe
REVENUES				
General	Decline	Decline	Decline	Decline
Own Source	Decline	Decline	Decline	Decline
Intergovernmental	Increase	Increase	Increase	Increase
Fees & Charges	Mixed	Mixed	Increase	Decline
EXPENDITURES				
General	Decline	Decline	Decline	Decline
Public Education	Decline	Decline	Mixed	Decline
Social Services	Mixed	Mixed	Mixed	N/A
Public Safety	Decline	Mixed	Decline	Decline
Public Works	Mixed	Mixed	N/A	Increase
DEBT				
Total Long-Term Debt Outstanding	Mixed	Mixed	Decline	Mixed
Non-Guaranteed Long-Term Debt Outstanding	Mixed	Mixed	Mixed	Mixed
Total New Long-Term Debt Issued/Year	Decline	Mixed	Decline	Decline
Ratio of Non-Guaranteed LTD/Total LTD	Increase	Increase	Mixed	Increase

With regard to the effects of tax and expenditure limitations on the largest components of expenditure, the results of the analyses show that all four groups of local governments experienced overall declines in the levels of general expenditures. Similarly to the situation with general revenues, general expenditures of local governments in the urban cores of metropolitan areas were more adversely affected by the imposition of TELs than general expenditures of local governments in the suburban fringes. This is consistent with the findings of past studies, and in itself, is indicative of the overall impact of fiscal limits on the finances of local governments.

This study, however, did not find that the expenditures on core public services declined across the board. It appears that the situation is specific for each group of local governments, and reflects the unique characteristics of demand for local government services in individual locales as well as specific types of TELs imposed. In particular, when it comes to spending on public education, it declined in urban cores, suburban fringes, and stressed suburban fringes, but the effects of TELs on this component of expenditure are mixed for stressed urban cores of metropolitan areas.

These results should be considered in the context of declining own source revenues of local governments in the presence of limitations. Taken together, these fiscal trends suggest that the reduced spending on public education can be attributed to the constraints imposed on local property taxes – primary instrument of public education financing. Nonetheless, this does not mean that the level of public education financing *per se* declined, what follows from these analyses is that the local governments' share of public education financing has declined. This, in turn, points out to the increasing fiscal participation of state and federal governments in primary and secondary education.

One of the most surprising findings of this study is that the imposition of TELs is associated with declines in spending on public safety, except in suburban fringes, where the results are mixed. This contradicts the dominant line of reasoning about the behavior of local governments operating under TELs. According to past research, local governments typically avoid cutting spending on law enforcement and fire protection even in the most difficult fiscal environments. This may mean that the fiscal consequences of TELs for the budgets of local governments were so severe that they had no other choice but to reduce spending on police, fire, and code enforcement.

The overall effects of TELs on social services spending vary among groups of local governments, except for stressed suburban fringes, where the imposition of fiscal limits is not associated with any measurable changes. This group of local governments stands out, however, because it is the only group in the sample, where spending on public works increased in the presence of TELs. The overall results of the analyses for this category of expenditure were mixed in urban cores and suburban fringes. Fiscal limits did not have any measurable effects on public works spending by local governments serving stressed urban cores.

In general, these findings suggest that local governments in different geographic segments of metropolitan areas employ various selective response strategies when they operate under fiscal constraints. These strategies include: sharing funding responsibility for a specific core public service with higher level governments; reducing spending on specific service(s) in absolute

terms, hence, rationing some services; implementing proportional adjustments in spending on specific core service contingent upon the performance of underlying revenue stream(s). If the expenditure and the revenue effects of TELs are considered together, they clearly demonstrate how dramatically the range of fiscal choices available to local governments has shrunk in the last thirty years.

Finally, with regard to the effects of tax and expenditure limitations on the levels of public debt, this study revealed a generally mixed picture. While these analyses do suggest that TELs are associated with increased public debt burden, as prior studies have found, the specific debt effects of limitations depend on locales and types of TELs.

Contrary to some prior studies, the levels of non-guaranteed long-term debt do not appear to be rising uniformly across all groups of local governments. This is true only for urban cores, suburban fringes, and stressed suburban fringes. In these areas the ratios of non-guaranteed to total long-term debt do increase in the presence of TELs. This may imply that local governments in these geographic segments are more likely to enter into more expensive borrowing arrangements.

These general conclusions can be summarized as follows:

1. Overall fiscal effects of tax and expenditure limitations in the urban cores and suburban fringes of metropolitan areas follow general asymmetrical trends identified by past research;

2. Specific revenue, expenditure and debt effects varied by comparison group, type of limit imposed, and measure of fiscal outcome;

3. Local governments in the urban cores of metropolitan areas are more adversely affected by the imposition of tax and expenditure limitations;

4. General revenues and general expenditures declined in all comparison groups of local governments, but urban core local governments experienced larger declines;

5. In all groups of local governments own source revenues declined, intergovernmental revenues increased, spending on public education and public safety declined with larger declines observed in the urban cores;

6. Long-term debt, especially non-guaranteed debt, has been rising more quickly in the urban core segments of metropolitan areas;

7. Overall fiscal effects of tax and expenditure limitations were more pronounced and more adverse in the fiscally stressed subgroups of local governments.

6.6. Contribution

This dissertation has examined the nature of the fiscal effects of tax and expenditure limitations on general and special purpose local governments serving urban cores and suburban fringes of the largest metropolitan areas in the contiguous United States.

This is the first empirical study, which investigated the detailed profiles of post-TELs effects on principal items of revenue, largest components of expenditure, and levels of public debt in these geographic segments in the period between 1972 and 2002. It continues prior research on the topic of fiscal limits, and adds to it by expanding our current knowledge of the fiscal consequences of the laws, which restrict fiscal choices of local governments. The dissertation contributes to the extant body of knowledge in the following ways.

First, it provides further empirical evidence to past findings about the overall impact and the general fiscal trends associated with the imposition of tax and expenditure limitations. By providing new empirical data, this dissertation adds to the factual foundation upon which a comprehensive, internally consistent theory of fiscal constraints can be developed in the future.

The large size and diversity of dissertation's sample contribute to more reliable generalizations about the precise mechanisms of TELs action. The analysis of the formal aspects and the substantive nature of fiscal limits performed by the author has identified existing theoretical lacunae in the current knowledge of this multifaceted fiscal phenomenon. Identification of such deficiencies is important for the development of conceptual framework needed for future research on the topic.

Second, the dissertation places current tax and expenditure limitations into the broader historical context of fiscal constraints. By analyzing available historical evidence, this dissertation clearly demonstrates that modern tax and expenditure limitation measures are not a historical aberration, but a logical continuation of past waves of fiscal containment. This dissertation provides a more coherent chronology of the fiscal containment activity in the United States in the last 200 years.

Finally, the findings of the dissertation can serve as an indirect assessment of the effectiveness of existing public policies, which impose fiscal constraints on local governments. Specifically, they raise the issue of serious unintended consequences of such policies, and particularly their social, equity, and government efficiency costs.

The results of the statistical analyses can serve as objective evaluations of the ramifications of micromanagement of local governments' fiscal affairs through the use of such blunt instruments as TELs. They imply that blanket application of tax and expenditure limitations largely disregards important structural and service responsibilities differences between local governments operating in different geographic segments of metropolitan areas and serving different populations.

6.7. Suggestions for Future Research

Several suggestions for future research can be made. First and most obvious is to expand the scope and/or increase the scale of analysis. The latter can be achieved by increasing detalization within metropolitan county areas, i.e. by separating the revenue, expenditure and debt effects of TELs on county, municipal, and school districts governments.

The former can be achieved by the expansion of timeframe of analysis, i.e. by including pre-1972 censuses of government, and also by incorporating the data from the latest 2007 census. However, several problems should be solved in the process: proper classification of re-designated metropolitan county areas and metropolitan areas between censuses of governments; consistent reporting of fiscal data; and the availability of machine readable pre-1970 census data on control variables.

Another promising venue for future research may involve a change in the focus of research from the investigation of fiscal effects of local TELs only to more comprehensive investigation of the interactive effects of different kinds of fiscal limits.

The first option here would be to explore the cumulative impact of simultaneous existence of state and local TELs on general and special purpose local governments. Since local governments increasingly rely on intergovernmental transfers, it would be interesting to investigate the full extent of fiscal effects in the presence of both types of TELs.

Exploration of interactive effects may not be limited to conventional state and local TELs only. Since the mid-1990s a significant number of municipalities independently enacted their own limitations. According to Brooks and Phillips, at least one in eight municipalities operates under a locally imposed limit on revenues or expenditures and these limits focus predominantly on the property tax (Brooks & Phillips, 2009). Given the spread of such self-imposed TELs, it would be useful to examine whether the finances of municipalities in this category are different and if so, how different they are from a structural viewpoint.

Yet another promising research venue may be to compare, the post-TELs fiscal effects across various categories of metropolitan areas. The Office of Management and Budget classifies metropolitan areas into megapolitan, macropolitan and micropolitan depending on population[102].

A number of past studies of metropolitan governance pointed to the existence of important structural differences between metropolitan areas of different sizes (Barlow, 1997; Ostrom, Tiebout, & Warren, 1961); especially in terms of economic cohesiveness (Gainsborough, 2001; Pack, 1992, 1998; Sacher, 1993; Savitch, Collins, Sanders, & Markham, 1993), fiscal interdependency (Parks & Oakerson, 2000; Post & Stein, 2000), and revenue base sharing (Hamilton, Miller, & Paytas, 2004).

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[102] *Megapolitan area* – CBSA containing one or more cores with at least 1,000,000 population combined, plus adjacent counties; *macropolitan area* – CBSA containing one or more cores with less than 1,000,000 population combined plus adjacent counties; *micropolitan area* – CBSA containing one or more cores that together have at least 50,000 population plus adjacent counties (OMB, 1999, p. 56644).

Past studies of the effects of TELs did not address this issue and treated all metropolitan areas as essentially the same. However, since metropolitan areas are different, this may have an impact on fiscal effects of TELs. For example, the levels of asymmetricity in fiscal effects may vary as we move from megapolitan to macropolitan and to micropolitan areas.

Similarly, the question of the relationship between the size of constituent metropolitan county areas and the degree of TELs effects has never been explored. All past studies looked into the general trends without disaggregating them by size of counties. Yet both suburban fringe and suburban core county areas vary in their sizes in the same way as metropolitan areas do. In fact, the US Department of commerce classifies county areas into 7 categories depending on the size of resident population they serve[103]. The underlying logic of such classification is the significant differences between county areas of different sizes in terms of fiscal capacities and service responsibilities. Since the county areas vary, then the question remains open about the profile of fiscal effects of TELs as we move from smaller to larger county areas.

One more venue for future research may involve changing the mode of research from exploratory to probative, i.e. focusing more on testing existing models of fiscal limits and hypotheses associated with them based on already accumulated empirical data.

For example, following the "resource competition hypothesis" (Vigdor, 2004), it will be interesting to test whether the fiscal behavior of unconstrained local governments does differ in the presence of constrained local governments within the same county area. For instance, what happens with revenue sources of unconstrained municipal governments, if county governments within the area are constrained? Similarly, the fiscal effects of the removal of local TELs never have been investigated. Yet a number of governments were relived from constraints in the recent period, and enough time passed for the effects to develop.

Finally, future research may also concentrate on improving robustness of statistical analyses. At least two options for such improvement exist. Since this and past studies essentially disregarded the existing variation in the degree of TELs stringency, reclassifying the independent variable will make capturing the effects of this variation possible.

Another important issue is the underlying statistical model. The majority of past studies of fiscal effects of TELs relied on standard OLS model. Nevertheless, since the method of ordinary least squares is built on assumptions of linear relations, it has limitations. Specifically, OLS is highly sensitive to outliers, it is limited to only one dependent variable, it assumes that the process is structurally stable but time series designs may cover periods of structural change and regime shifts, and finally, it does not deal adequately with volatility in time series.

Future research needs to employ alternative statistical models, and at least, assess their competitive performance, especially compared to the OLS. There are several possible candidates for this role: Bayesian linear regression, the method of least absolute deviations (LAD), and non-parametric multiplicative regression (NPMR).

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[103] In particular, the Department of commerce classifies county governments into 7 specific categories by population size group: 1) 500,000 or more, 2) 250,000 to 499,999, 3) 100,000 to 249,999, 4) 50,000 to 99,999, 5) 25,000 to 49,999, 6) 10,000 to 24,999 and 7) less than 10,000 (USCB, 2002, pp. 7-8).

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APPENDIX A - CURRENT STATE TAX AND EXPENDITURE LIMITATIONS – 2009

State*	Adoption Method	Means of Adoption	Limitation			Override Provisions	Exemptions
			Revenue	Expenditure	Growth		
AK	Referendum	Constitutional		1982 (A)	POP/CPI	¾ L	C
AZ	Referendum	Constitutional		1978 (AT)	INC	2/3 L	
	Referendum	Constitutional	1979 (T)		T	2/3 L	
	Initiative	Constitutional	1992 (T)		T	2/3 L	
AR	Legislature	Constitutional	1934 (T)		T	¾ L	
CA	Initiative	Constitutional	1978 (T)		T	2/3 L	
	Initiative	Constitutional		1979 (AT)	INC	EM	
CO	Legislature	Statutory		1991 (GF)	INC or 6%	EM – 2/3 L	
	Initiative	Constitutional	1992 (T)		T, Refund	EM – 2/3 L V	
	Initiative	Constitutional		1992 (E)	POP/CPI	EM – 2/3 L V	
	Referendum	Constitutional	2005 (T)	2005 (ECN)		EM – 2/3 V	S (till 2011)
CT	Referendum	Constitutional		1992 (A)	INC/CPI	EM – 3/5 L	D,G,M,BR
DE	Referendum	Constitutional		1978 (GF)	PCT	EM – 3/5 L	
	Initiative	Constitutional	1980/81(T)		T	3/5 L	D
FL	Referendum	Constitutional	1971 (CIT)		T	3/5 L	
	Referendum	Constitutional	1994 (R)		INC	2/3 L	
	Initiative	Constitutional	1996 (T)		T	2/3 V	
HI	CC	Constitutional		1978 (GIF)	ECN	2/3 L	
ID	Legislature	Statutory		1980/94 (GF)	INC		NR
IA	Legislature	Statutory		1992 (GF)	PCT		
LA	Legislature	Statutory	1979 (T)		INC	L	
	Referendum	Constitutional		1993 (GF)	INC	2/3 L	
	Initiative	Constitutional	1996 (T)		T	2/3 L	
MD	Legislature	Statutory		1979 (E)	ECN	L	Advisory
MA	Initiative	Statutory	1986 (T)		WAGES	L	Amendable
	Initiative	Constitutional	2000 (IT)				
ME	Legislature	Statutory		2005 (F)		2/3 L-EM	D
MI	Initiative	Constitutional	1978		INC	2/3 L-EM	
MS	Referendum	Constitutional	1970 (T)		3/5 L	3/5 L	
	Legislature	Statutory		1992 (A)	PCT		
MO	Initiative	Constitution	1980 (GF, T)		INC, Refund	2/3 L-EM, V	
	Legislature	Constitution	1996 (T)		V	L-EM, 1 year	
MT	Legislature	Statutory		1981 (A)	INC	2/3 L-EM	
	Initiative	Constitutional	1998 (T)		V	¾ L	Invalidated
NV	Legislature	Statutory		1979 (PE)	POP/CPI	Discretionary	
	Initiative	Constitutional	1996 (T)		2/3 L	2/3 L	
NJ	Legislature	Statutory		1990 (GF)	INC		D,C,G
NC	Legislature	Statutory		1991 (GF)	INC		
OH	Legislature	Statutory		2006 (CPI)		2/3 L-EM	
OK	Referendum	Constitutional		1985 (A)	PCT, CPI		
	Initiative	Constitutional	1992 (T)		¾ L	¾ L	
OR	Legislature	Statutory		1979 (A)	INC		
	Referendum	Constitutional	1996 (T)		3/5 L	3/5 L	
	Initiative	Constitutional	2000		Refund		
RI	Legislature	Statutory		1935/1994 (A)	Fixed		
	Referendum	Constitutional		1992 (GF)	PCT		
SC	Referendum	Constitutional		1980/1984 (A)	INC, EMP	2/3L-EM, 1yr	
SD	Initiative	Constitutional	1978 (T)		2/3 L,V	2/3 L	
	Referendum	Constitutional	1996 (T)		2/3 L,V		
TN	CC	Constitutional		1978 (AT)	INC	L	
TX	Referendum	Constitutional		1978 (AT)	INC/ECN	L-EM	
UT	Legislature	Statutory		1988 (A)	INC/POP	2/3 L-EM, V	
VA	Legislature	Constitutional		1992	EXP		
WA	Initiative	Statutory		1993 (E)	POP/CPI	2/3 L-EM	
	Initiative	Statutory	1993 (T)		V	V	
	Initiative	Statutory	1999 (T)				Invalidated
WI	Legislature	Statutory		2001 (INC)		2/3 L-EM	

Legend: 2/3L-amounts over expenditure limit requires V, **A**-appropriation increase, **AT**-tax revenue appropriation, **BR**-budget reserves, **C**-capital projects, **CC**-constitutional convention, **CIT**-corporate income tax, **CPI**–inflation/consumer price index, **D**-debt payment, **ECN**-growth in state economy, **E**-expenditure increase, **EM**-emergency, **EMP**-limits employment growth, **EXP**-revenue limited to expenditures, **FIXED**-fixed percentage allowable growth, **GF**-general fund, **G**-grants, **INC**–per capita income/personal income, **IT**-alters personal income tax structure, **L**- legislature approval, **M**-court mandates, **NR**-non-recurring general fund appropriations exempt, **OEL**-limit tax changes to amounts below the expenditure limit w, **PCT**-percent of revenue, creates a reserve, **PE**-proposed expenditures, **POP**–population, **R**-revenue, **S**-suspended, **T**-new/increased taxes/fees, **V**-voter approval, **WAGES**-growth limited to growth in wages/salaries, * The data were updated by the author to reflect the changes as of 2009.

Sources: Mullins, D. and Wallin, B. "Tax and Expenditure Limitations: An Introduction and Overview." *Public Budgeting and Finance,* 2004/24(4), p.11-12; and Waisanen, B. "State Tax and Expenditure Limits – 2008." National Conference of State Legislatures, Report, p.17, Washington, DC, 2009.

States*	Overall Property Tax Rate Limit	Specific Property Tax Rate Limit	Property Tax Revenue Limit	Assessment Increase Limit	General Revenue Limit	General Expenditure Limit	Full Disclosure Truth in Taxation
C – county; M – municipality; D – school district; (R) – repealed (year); (S) – suspended (year)							
AL	1972 CMD 1978 CMD	1975 CM 1916 D					
AK		1972 M	1972 M				
AZ	1980 CMD	1913 CM 1980 CM	1913 CM 1980 CM	1980 CMD		1921 CM 1980 CM 1974 , 1981 D	
AR		1883 CM	1981 CMD	2000 CMD			
CA	1978 CMD 1986 CMD	1997 CMD		1978 CMD	1972 S	1979 CMD 1990 CMD	
CO		1992 CMD	1913 CM 1992 D		1992 CMD	1992 CMD	1983 CM 1992 D
DE			1972 C				1976 C
FL		1968 CM 1855, 1968, 1973 D		1995 SMD			1984 CMD 1980 CMD
GA		1890 C 1982 (R) C 1945 D					1991 CMD
HI							1977 C
ID	1978 CMD	1913 C 1967 M 1963 D	1979 CMD 1992 (R)CMD				1991 CMD
IL		1939 C 1961 MC	1991 CMD				1981 CMD
IN			1973 CMD 1977 CMD 1980 CMD				
IA		1983 C 1972, 1992 M 1989 D		1978 CMD 1980 CMD		1971 D	1983 C
KS		1933 CMD 1989 (S) CM	1970 CM 1989 (S) CM			1973 S	
KY		1908 CM 1985 M 1946 D	1979 CMD				1979 CMD
LA		1974 CMD	1978 CMD				
MD				1957 CMD 1991 CMD			1977 CM
MA		1980, 1991 M	1980, 1983 M				
MI	1933 CS	1949 M 1994 D	1978 CMD	1994 CMD			1982 CMD
MN					1971 CM 1993 (R)CM		1985 CMD
MS			1980 CM 1909,1983 D				
MO		1875 CMD	1980 CMD				
MT		1931, 1987 C 1965 M 1971 D	1987 CM				1974 CMD
NE		1903 C 1957 M 1921, 1999 D	1990 CM			1996 CM 1991 D 1996 D	1990 CM
NV	1936 CMD	1929 MD	1983 CM 1987 M		1984 CM 1989 (R)CM		1985 CMD
NJ			1980 C			1976, 1991 M 1976, 1990 D	
NM	1914 CMD	1973 CMD 1987 CMD	1979 CMD	1979 CMD 2000 CMD			

State							
NY		1894 CMD		1981 C 1986 M			
NC		1983CM					
ND		1929 CMD	1981 CM				
OH	1929 CMD 1934 CMD 1953 CMD		1976 CMD				
OK	1933 CMD			1996 CMD			
OR	1991 CMD	1997 CM 1991, 1997 D					
PA		1959 CMD	1940 C				
RI			1985 M			1979M	
SC						1975 CMD	
SD		1915 CMD					
TN						1979 CM	
TX		1876 CM 1888 D	1982 CMD			1982 CMD	
UT		1898 C 1929 M 1929, 1988 S	1969 CMD 1986 (R) CMD			1986 CMD	
VA						1976 CM	
WA	1944 CMD 1973 CMD	1973 CM	1971 CM 1979 CM 2001 CM 1979, 2001 D	2000 CMD		1990 CMD	
WV	1939 CMD	1939 CMD	1990 CMD				
WI			1997 D		2005 CM		
WY		1890 CM 1911 D					

Source: Mullins, D. and Wallin, B. "Tax and Expenditure Limitations: An Introduction and Overview." *Public Budgeting and Finance, 2004/2*4(4), p.4-5.

* The original table was updated by the author to reflect the changes as of 2009.

APPENDIX C – TELs BY FUNCTIONAL TYPE AND DEGREE OF STRINGENCY

Overall Property Tax Rate Limitations
Limits on Property tax rates are the most common form of TEL. If the limit is on overall property tax rates, a rate ceiling is set that cannot be exceeded without a vote of the electorate, and applies to the aggregate tax rate of all local government.

Nonbinding: easily circumvented through alterations in assessment practices.
Potentially binding: if coupled with a limit on assessment increases.

Specific Property Tax Rate Limit
Same as overall property tax rate limit, except it applies to specific types of local jurisdictions or narrowly defined service areas.

Nonbinding: can be circumvented through alterations in assessment practices, or in case of specific services, through inter-fund transfers (fungibility).
Potentially binding: if coupled with a limit on assessment increases.

Property Tax Levy Limit
Constraints the total amount of revenue that can be raised from the property tax, independent of the property tax rate, often enacted as an allowable annual percentage increase in the levy.

Potentially binding: the fixed nature of revenue ceiling makes this limit, ceteris paribus, a more formidable constraint but it can be limited through a diversification of revenue sources (which is its underlying intent).

General Revenue or General Expenditure Increases
In the case of revenue limits, these cap the amount of revenue that can be collected, while expenditure limits attempt to constraint spending during the fiscal year. These are often indexed to the rate of inflation.

Potentially binding: the fixed nature of the revenue or expenditure ceiling makes this, ceteris paribus, a more formidable constraint.

Limits on Assessment Increases
Since the property tax collected is a function of the assessed valuation of the property, and the tax rate, this type of limitation controls the ability of local governments to raise revenues by reassessment of property or through natural or administrative escalation of property values.

Nonbinding: easily avoided through an increase in property tax rate.
Potentially binding: if coupled with an overall or specific property tax rate limit.

Full Disclosure – Truth in Taxation
Generally require some type of public discussion and specific legislative vote prior to the enactment of tax rate or levy increases.

Nonbinding: requires only a formal vote (generally a simple majority) of the local legislative body to increase the tax rate.

Source: Mullins, D. and Cox, K. "Tax and Expenditure Limits on Local Governments." Advisory Commission on Intergovernmental Relations, Washington, DC, Report M-194, March 1995, p. iii-iv.

APPENDIX D – CHRONOLOGY OF SUCCESSFUL STATE TELs (1970-2009)

Year	Event
1971	**Washington**: constitutional amendment limits property tax to 1% of market value
1976	**Ohio**: Passes House Bill 920 limiting property tax increases
1978	**California**: Proposition 13 limits property taxes to 1% of the acquisition price **Arizona**: Constitutional amendment limits growth in state expenditures to a maximum of 7.23% **Delaware**: Limits state appropriations to 98% of state revenues **Hawaii**: Limits increases in state expenditures to the percentage of state growth **Illinois**: Limitation on state spending **Michigan**: Constitutional amendment limits: growth in state expenditures to the population growth adjusted for inflation, state revenues to 9.49% of annual personal income **South Dakota**: imposition of 2/3 legislative majority rule for any state expenditure increases **Texas**: Constitutional amendment limits state expenditures to the rate of state personal income growth **Tennessee**: Constitutional amendment limits state appropriations to state personal income growth
1979	**California**: Proposition 4 limits annual state appropriations to personal income growth adjusted for population increases **Washington**: Initiative 62 restricts total state and local property tax collections to 6% of fair market value
1980	**Idaho**: statutorily limits increases in state appropriations to 5.33% of state personal income **Massachusetts**: Proposition 21/2 limits state property tax increases to 2.5% annually **Missouri**: Constitutional limit restricts revenue increases to 5.64% of the prior year personal income **Ohio**: House Bill 920 approved as a constitutional amendment **South Carolina**: Constitutional amendment limits state expenditure increases to personal income growth in the previous year
1981	**Montana**: state expenditure increases limited by a statute to a percentage of state personal income growth
1982	**Alaska**: Constitutional amendment limits state expenditure increases to inflation adjusted population growth **Colorado**: Gallagher Amendment to state constitution prescribes that 45% of state property tax must be collected from residential property and 55% from commercial property **West Virginia**: limits property tax assessments to 60% of market value
1985	**Oklahoma**: constitutionally limits state expenditure increases to 12% of annual growth and appropriations to 95% of revenues
1986	**California**: Proposition 62 requires voter approval for any local property tax increases **Massachusetts**: statutorily limits revenue collections to the average increase in state wage growth for the previous three years **Oregon**: property tax rates pegged to 1986 assessments levels **Utah**: property tax rates limited to 2.4 mills
1989	**Utah**: statutory limit restricting state expenditure increases to population adjusted to inflation
1990	**Oregon**: residential property tax rate is limited to a 0.5% maximum **New Jersey**: statutorily limits state expenditure increases to growth in state personal income
1991	**Colorado**: statutory spending restriction limits general fund appropriations to the lesser of 5% of total state personal income or 6% over the previous fiscal year's appropriations **Connecticut**: statutorily limits state budget growth to either average growth in personal income over the preceding 5 years or the previous fiscal year's increase in inflation, whichever is greater **North Carolina**: statutorily limits state expenditures
1992	**Colorado**: Taxpayer's Bill of Rights constitutionally limits state revenues and expenditures to population growth adjusted to inflation. Voter approval of any increases in state revenues/expenditures. **Iowa**: statutorily limits appropriations to 99% of projected revenue collections **Rhode Island**: constitutionally limits state appropriations to 98% of projected revenue collections
1993	**Louisiana**: constitutionally limits state expenditures to prior year's appropriations adjusted to annual increases in state per capita personal income **Washington**: statutorily limits expenditure increases to the 3-year inflation average adjusted to population growth
1994	**Florida**: constitutionally limits revenue collections to the 5-year average growth in state personal income
1996	**Missouri**: constitutionally limits state revenue collections to 5.64% of the preceding year's total state personal income
2000	**Oregon**: constitution clause that any general fund revenue in excess of 2% of the revenue projection must be refunded to taxpayers
2001	**Oregon**: statutorily limits growth in state appropriation to 8% of expected state personal income **Wisconsin**: statutorily limits spending growth on appropriations to the personal income growth rate
2002	**Indiana**: statutory formula-based expenditure limit
2005	**Maine**: statutorily limits growth in expenditures to the maximum of 2.75% of 10-year average of personal income growth

Source: Hill, E. "A Review of Tax and Expenditure Limitations and Their Impact on State and local Government in Ohio." The Center for Public Management. Cleveland State University, 2006, p. 69-71, Cleveland, Ohio.

APPENDIX E – PRINCIPAL COMPONENTS ANALYSIS RESULTS (PANELS E1 – E20)

PANEL E-1. Principal Components Analysis						
The MEANS Procedure Results						
Primary County Areas (P)						
Variable	*μ*	*σ*	*SE*	*V*	*N*	*CV*
POP1	438733.223	760112.552	19068.48	5.778E+11	1589	173.252
POP2	7.69894E+11	5.21E+12	1.31E+11	2.71E+25	1589	676.110
POP3	765.356	1354.890	33.989	1835726.8	1589	177.027
POP4	6.328	8.287	0.208	68.671	1589	130.952
POP5	0.271	0.033	0.001	0.001	1589	12.202
POP6	0.116	0.034	0.001	0.001	1589	29.057
HZ1	2.722	0.267	0.007	0.071	1589	9.822
HZ2	0.290	0.193	0.005	0.037	1589	66.548
EDU	0.061	0.031	0.001	0.001	1589	51.022
EMP1	0.559	0.162	0.004	0.026	1589	28.934
EMP2	0.080	0.048	0.001	0.002	1589	60.623
EMP3	0.094	0.027	0.001	0.001	1589	28.484
EMP4	0.149	0.069	0.002	0.005	1589	46.294
PCI	24091.444	5250.901	131.726	27571963	1589	21.796
SSP	689.293	202.150	5.071	40864.675	1589	29.327
DIV	2968.103	931.784	23.375	868221.97	1589	31.393
POV	0.128	0.046	0.001	0.002	1589	36.186

	POP1	POP2	POP3	POP4	POP5	POP6	HZ1	HZ2	EDU	EMP1	EMP2	EMP3	EMP4	PCI	SSP	DIV	POV
POP1	1.00	0.88	0.36	0.00	-0.05	-0.01	0.00	-0.06	0.16	0.02	0.02	-0.06	0.11	0.25	0.10	0.15	-0.03
POP2	0.88	1.00	0.18	-0.01	0.00	-0.04	0.03	-0.02	0.07	0.00	0.02	-0.05	0.05	0.10	0.04	0.10	0.01
POP3	0.36	0.18	1.00	-0.27	-0.21	0.11	-0.16	0.21	0.36	0.29	0.04	-0.03	0.34	0.29	0.06	0.31	0.08
POP4	0.00	-0.01	-0.27	1.00	0.05	-0.10	0.15	-0.35	-0.34	-0.22	-0.28	-0.18	-0.16	-0.03	-0.07	-0.14	-0.08
POP5	-0.05	0.00	-0.21	0.05	1.00	-0.53	0.77	0.25	-0.03	-0.35	0.07	-0.33	-0.46	-0.51	-0.32	-0.17	0.17
POP6	-0.01	-0.04	0.11	-0.10	-0.53	1.00	-0.43	0.05	0.18	-0.14	-0.09	-0.03	0.05	0.11	0.12	0.10	0.03
HZ1	0.00	0.03	-0.16	0.15	0.77	-0.43	1.00	0.42	-0.08	-0.45	0.12	-0.51	-0.59	-0.57	-0.48	-0.28	0.13
HZ2	-0.06	-0.02	0.21	-0.35	0.25	0.05	0.42	1.00	0.22	-0.17	0.29	-0.30	-0.32	-0.41	-0.36	-0.25	0.04
EDU	0.16	0.07	0.36	-0.34	-0.03	0.18	-0.08	0.22	1.00	0.22	0.19	0.16	0.26	0.27	0.11	0.09	-0.11
EMP1	0.02	0.00	0.29	-0.22	-0.35	-0.14	-0.45	-0.17	0.22	1.00	0.28	0.83	0.85	0.57	0.17	0.30	-0.13
EMP2	0.02	0.02	0.04	-0.28	0.07	-0.09	0.12	0.29	0.19	0.28	1.00	0.20	0.00	0.01	-0.05	-0.22	-0.20
EMP3	-0.06	-0.05	-0.03	-0.18	-0.33	-0.03	-0.51	-0.30	0.16	0.83	0.20	1.00	0.71	0.46	0.24	0.19	-0.16
EMP4	0.11	0.05	0.34	-0.16	-0.46	0.05	-0.59	-0.32	0.26	0.85	0.00	0.71	1.00	0.70	0.31	0.40	-0.10
PCI	0.25	0.10	0.29	-0.03	-0.51	0.11	-0.57	-0.41	0.27	0.57	0.01	0.46	0.70	1.00	0.42	0.17	-0.45
SSP	0.10	0.04	0.06	-0.07	-0.32	0.12	-0.48	-0.36	0.11	0.17	-0.05	0.24	0.31	0.42	1.00	0.09	-0.20
DIV	0.15	0.10	0.31	-0.14	-0.17	0.10	-0.28	-0.25	0.09	0.30	-0.22	0.19	0.40	0.17	0.09	1.00	0.77
POV	-0.03	0.01	0.08	-0.08	0.17	0.03	0.13	0.04	-0.11	-0.13	-0.20	-0.16	-0.10	-0.45	-0.20	0.77	1.00

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PANEL E-3. Principal Components Analysis				
The PRINCOMP Procedure Results				
Eigenvalues of the Correlation Matrix; Primary County Areas (P); N=1589				
	Eigenvalue	*Δ*	*Proportion*	*Cumulative*
1	4.71	2.46	0.28	0.28
2	2.26	0.18	0.13	0.41
3	2.08	0.21	0.12	0.53
4	1.87	0.21	0.11	0.64
5	1.65	0.74	0.10	0.74
6	0.91	0.06	0.05	0.79
7	0.86	0.19	0.05	0.84
8	0.67		0.04	0.88

PANEL E-4. Principal Components Analysis								
The PINCOMP Procedure Results								
Eigenvectors; Primary County Areas (P); N=1589								
	PC(P)1	*PC(P)2*	*PC(P)3*	*PC(P)4*	*PC(P)5*	*PC(P)6*	*PC(P)7*	*PC(P)8*
POP1	0.09	0.42	0.22	-0.46	0.08	-0.14	-0.02	0.03
POP2	0.05	0.39	0.21	-0.44	0.11	-0.33	-0.01	0.09
POP3	0.17	0.41	0.05	0.06	-0.14	0.43	-0.22	-0.45
POP4	-0.10	-0.31	0.22	-0.29	0.16	0.22	-0.39	0.24
POP5	-0.32	0.13	-0.10	0.02	0.36	0.20	0.28	0.16
POP6	0.11	-0.02	0.14	0.07	-0.63	-0.22	-0.14	0.33
HZ1	-0.37	0.17	-0.11	-0.03	0.23	0.17	-0.02	0.10
HZ2	-0.19	0.34	-0.29	0.18	-0.24	-0.02	-0.18	-0.15
EDU	0.14	0.33	-0.21	0.06	-0.18	0.38	0.23	0.65
EMP1	0.36	0.05	-0.20	0.15	0.31	-0.04	-0.19	-0.05
EMP2	0.02	0.19	-0.46	0.02	0.06	-0.44	0.04	-0.04
EMP3	0.34	-0.10	-0.19	0.12	0.27	-0.25	-0.02	0.23
EMP4	0.41	0.02	-0.03	0.09	0.19	0.13	-0.13	0.03
PCI	0.38	-0.04	-0.06	-0.22	0.01	0.27	-0.04	0.01
SSP	0.23	-0.13	0.05	-0.17	-0.11	0.06	0.74	-0.25
DIV	0.18	0.18	0.45	0.37	0.16	0.00	0.08	0.07
POV	-0.09	0.17	0.44	0.46	0.13	-0.15	0.08	0.05

PANEL E-5. Principal Components Analysis						
The MEANS Procedure Results						
Non-Primary County Areas (NP)						
Variable	*μ*	*σ*	*SE*	*V*	*N*	*CV*
POP1	107107.008	188550.209	3131.217	3.555E+10	3626	176.039
POP2	47013288108	2.8966E+11	4.81E+09	8.39E+22	3626	616.127
POP3	232.6	469.636	7.799	220557.58	3626	201.907
POP4	10.271	12.035	0.2	144.846	3626	117.175
POP5	0.291	0.038	0.001	0.001	3626	13.132
POP6	0.114	0.034	0.001	0.001	3626	30.101
HZ1	2.87	0.289	0.005	0.083	3626	10.065
HZ2	0.327	0.244	0.004	0.06	3626	74.701
EDU	0.05	0.033	0.001	0.001	3626	65.541
EMP1	0.441	0.582	0.01	0.339	3626	132.015
EMP2	0.076	0.083	0.001	0.007	3626	108.717
EMP3	0.071	0.099	0.002	0.01	3626	139.457
EMP4	0.095	0.18	0.003	0.032	3626	189.616
PCI	22158.43	5880.239	97.652	34577205	3626	26.537
SSP	674.251	814.827	13.532	663943.21	3626	120.849
DIV	2492.816	990.396	16.447	980884.47	3626	39.73
POV	0.125	0.072	0.001	0.005	3626	57.922

PANEL E-6. Principal Components Analysis

The PRINCOMP Procedure Results

Correlation Matrix; Non-Primary County Areas (NP); N=3626; V=17

	POP1	POP2	POP3	POP4	POP5	POP6	HZ1	HZ2	EDU	EMP1	EMP2	EMP3	EMP4	PCI	SSP	DIV	POV
POP1	1.00	0.84	0.80	-0.03	-0.19	-0.11	-0.04	-0.24	0.24	0.05	0.01	0.08	0.10	0.49	0.04	-0.20	-0.29
POP2	0.84	1.00	0.58	-0.03	-0.10	-0.05	0.01	-0.12	0.11	0.03	0.00	0.03	0.06	0.28	0.02	-0.06	-0.13
POP3	0.80	0.58	1.00	-0.07	-0.19	-0.11	-0.02	-0.18	0.29	0.04	0.03	0.06	0.08	0.47	0.04	-0.20	-0.28
POP4	-0.03	-0.03	-0.07	1.00	0.17	-0.25	0.20	-0.19	-0.05	0.03	-0.09	0.06	0.06	0.07	-0.03	-0.03	-0.05
POP5	-0.19	-0.10	-0.19	0.17	1.00	-0.49	0.74	0.34	0.00	-0.12	-0.08	-0.15	-0.17	-0.38	-0.12	0.09	0.27
POP6	-0.11	-0.05	-0.11	-0.25	-0.49	1.00	-0.51	0.20	-0.10	0.05	0.04	0.06	0.05	-0.12	0.03	0.26	0.21
HZ1	-0.04	0.01	-0.02	0.20	0.74	-0.51	1.00	0.42	0.08	-0.08	-0.01	-0.12	-0.14	-0.40	-0.14	0.02	0.26
HZ2	-0.24	-0.12	-0.18	-0.19	0.34	0.20	0.42	1.00	-0.14	-0.09	0.03	-0.13	-0.14	-0.52	-0.13	0.19	0.42
EDU	0.24	0.11	0.29	-0.05	0.00	-0.10	0.08	-0.14	1.00	0.06	0.05	0.09	0.09	0.27	0.01	-0.07	-0.14
EMP1	0.05	0.03	0.04	0.03	-0.12	0.05	-0.08	-0.09	0.06	1.00	0.74	0.98	0.97	0.12	0.00	0.01	-0.06
EMP2	0.01	0.00	0.03	-0.09	-0.08	0.04	-0.01	0.03	0.05	0.74	1.00	0.70	0.64	0.02	-0.02	-0.04	-0.07
EMP3	0.08	0.03	0.06	0.06	-0.15	0.06	-0.12	-0.13	0.09	0.98	0.70	1.00	0.95	0.15	0.01	-0.01	-0.09
EMP4	0.10	0.06	0.08	0.06	-0.17	0.05	-0.14	-0.14	0.09	0.97	0.64	0.95	1.00	0.20	0.01	0.01	-0.08
PCI	0.49	0.28	0.47	0.07	-0.38	-0.12	-0.40	-0.52	0.27	0.12	0.02	0.15	0.20	1.00	0.10	-0.36	-0.64
SSP	0.04	0.02	0.04	-0.03	-0.12	0.03	-0.14	-0.13	0.01	0.00	-0.02	0.01	0.01	0.10	1.00	-0.06	-0.09
DIV	-0.20	-0.06	-0.20	-0.03	0.09	0.26	0.02	0.19	-0.07	0.01	-0.04	-0.01	0.01	-0.36	-0.06	1.00	0.90
POV	-0.29	-0.13	-0.28	-0.05	0.27	0.21	0.26	0.42	-0.14	-0.06	-0.07	-0.09	-0.08	-0.64	-0.09	0.90	1.00

PANEL E-7. Principal Components Analysis				
The PRINCOMP Procedure Results				
Eigenvalues of the Correlation Matrix; Non-Primary County Areas (NP); N=3626				
	Eigenvalue	*Δ*	*Proportion*	*Cumulative*
1	4.13	0.90	0.24	0.24
2	3.22	0.95	0.19	0.43
3	2.28	0.43	0.13	0.57
4	1.85	0.67	0.11	0.67
5	1.17	0.19	0.07	0.74
6	0.98	0.02	0.06	0.80
7	0.96	0.30	0.06	0.86
8	0.66		0.04	0.90

PANEL E-8. Principal Components Analysis								
The PINCOMP Procedure Results								
Eigenvectors; Non-Primary County Areas (NP); N=3626								
	PC(NP)1	*PC(NP)2*	*PC(NP)3*	*PC(NP)4*	*PC(NP)5*	*PC(NP)6*	*PC(NP)7*	*PC(NP)8*
POP1	0.29	-0.27	0.18	0.37	0.02	-0.11	0.08	0.00
POP2	0.21	-0.22	0.18	0.44	0.05	-0.23	0.18	-0.02
POP3	0.27	-0.26	0.16	0.32	-0.05	0.01	0.00	0.06
POP4	0.00	-0.01	0.21	-0.25	0.62	-0.26	0.01	0.62
POP5	-0.24	0.05	0.48	-0.07	-0.02	0.07	0.06	-0.11
POP6	0.00	0.13	-0.48	0.28	-0.13	-0.07	-0.04	0.48
HZ1	-0.20	0.03	0.55	0.01	-0.10	0.06	0.06	0.10
HZ2	-0.25	0.16	0.11	0.23	-0.47	-0.09	0.11	0.45
EDU	0.14	-0.09	0.15	0.08	-0.04	0.73	-0.49	0.30
EMP1	0.31	0.41	0.10	-0.01	0.01	-0.02	0.03	-0.01
EMP2	0.23	0.35	0.10	0.00	-0.22	0.00	0.05	-0.09
EMP3	0.33	0.39	0.09	-0.01	0.03	-0.02	0.01	0.02
EMP4	0.33	0.38	0.08	0.00	0.07	-0.01	0.01	0.01
PCI	0.35	-0.23	-0.06	-0.12	0.12	0.06	-0.14	-0.03
SSP	0.06	-0.05	-0.12	-0.06	0.11	0.53	0.82	0.11
DIV	-0.19	0.22	-0.09	0.42	0.45	0.14	-0.10	-0.19
POV	-0.29	0.24	0.00	0.41	0.29	0.10	-0.02	-0.10

PANEL E-9. Principal Components Analysis					
The MEANS Procedure Results					
Stressed Primary County Areas (SP)					
Variable	*μ*	*σ*	*SE*	*V*	*N*	*CV*
POP1	527330.188	1015470.97	36932.32	1.03E+12	763	192.568
POP2	1.31E+12	7.46E+12	2.71E+11	5.57E+25	763	570.593
POP3	957.733	1545.916	56.224	2389855.5	763	161.414
POP4	3.505	7.095	0.258	50.332	763	202.429
POP5	0.277	0.03	0.001	0.001	763	10.749
POP6	0.119	0.028	0.001	0.001	763	23.55
HZ1	2.736	0.262	0.01	0.069	763	9.593
HZ2	0.325	0.204	0.007	0.042	763	62.616
EDU	0.064	0.033	0.001	0.001	763	51.06
EMP1	0.555	0.162	0.006	0.026	763	29.165
EMP2	0.081	0.044	0.002	0.002	763	54.253
EMP3	0.094	0.028	0.001	0.001	763	29.485
EMP4	0.149	0.066	0.002	0.004	763	44.62
PCI	23026.878	4555.984	165.7	20756988	763	19.786
SSP	675.486	128.022	4.656	16389.713	763	18.953
DIV	3245.057	1007.164	36.63	1014379.1	763	31.037
POV	0.144	0.048	0.002	0.002	763	33.236

PANEL E-10. Principal Components Analysis

The PRINCOMP Procedure Results

Correlation Matrix; Stressed Primary County Areas (SP); N=763; V=17

	POP1	POP2	POP3	POP4	POP5	POP6	HZ1	HZ2	EDU	EMP1	EMP2	EMP3	EMP4	PCI	SSP	DIV	POV
POP1	1.00	0.92	0.40	0.03	-0.05	-0.11	0.03	-0.04	0.19	0.02	0.03	-0.09	0.11	0.31	0.13	0.12	-0.08
POP2	0.92	1.00	0.21	0.02	-0.02	-0.09	0.05	-0.04	0.08	0.00	0.04	-0.07	0.06	0.17	0.08	0.09	-0.03
POP3	0.40	0.21	1.00	-0.27	-0.19	0.09	-0.11	0.27	0.48	0.21	0.15	-0.05	0.26	0.33	0.12	0.27	0.05
POP4	0.03	0.02	-0.27	1.00	0.14	-0.19	0.18	-0.35	-0.35	-0.19	-0.28	-0.17	-0.08	-0.06	-0.12	-0.02	0.05
POP5	-0.05	-0.02	-0.19	0.14	1.00	-0.56	0.78	0.18	-0.14	-0.28	0.01	-0.30	-0.41	-0.45	-0.45	-0.17	0.13
POP6	-0.11	-0.09	0.09	-0.19	-0.56	1.00	-0.46	0.13	0.13	-0.22	-0.11	-0.16	-0.04	0.04	0.14	0.06	0.04
HZ1	0.03	0.05	-0.11	0.18	0.78	-0.46	1.00	0.36	-0.16	-0.42	0.08	-0.48	-0.57	-0.56	-0.69	-0.28	0.10
HZ2	-0.04	-0.04	0.27	-0.35	0.18	0.13	0.36	1.00	0.24	-0.14	0.35	-0.24	-0.32	-0.35	-0.49	-0.33	-0.09
EDU	0.19	0.08	0.48	-0.35	-0.14	0.13	-0.16	0.24	1.00	0.27	0.24	0.15	0.32	0.41	0.22	0.11	-0.15
EMP1	0.02	0.00	0.21	-0.19	-0.28	-0.22	-0.42	-0.14	0.27	1.00	0.38	0.87	0.85	0.60	0.38	0.33	-0.07
EMP2	0.03	0.04	0.15	-0.28	0.01	-0.11	0.08	0.35	0.24	0.38	1.00	0.26	0.09	0.06	-0.03	-0.21	-0.23
EMP3	-0.09	-0.07	-0.05	-0.17	-0.30	-0.16	-0.48	-0.24	0.15	0.87	0.26	1.00	0.74	0.50	0.46	0.18	-0.16
EMP4	0.11	0.06	0.26	-0.08	-0.41	-0.04	-0.57	-0.32	0.32	0.85	0.09	0.74	1.00	0.76	0.59	0.44	-0.06
PCI	0.31	0.17	0.33	-0.06	-0.45	0.04	-0.56	-0.35	0.41	0.60	0.06	0.50	0.76	1.00	0.69	0.27	-0.37
SSP	0.13	0.08	0.12	-0.12	-0.45	0.14	-0.69	-0.49	0.22	0.38	-0.03	0.46	0.59	0.69	1.00	0.18	-0.28
DIV	0.12	0.09	0.27	-0.02	-0.17	0.06	-0.28	-0.33	0.11	0.33	-0.21	0.18	0.44	0.27	0.18	1.00	0.78
POV	-0.08	-0.03	0.05	0.05	0.13	0.04	0.10	-0.09	-0.15	-0.07	-0.23	-0.16	-0.06	-0.37	-0.28	0.78	1.00

	PANEL E-11. Principal Components Analysis			
	The PRINCOMP Procedure Results			
	Eigenvalues of the Correlation Matrix; Stressed Primary Areas (SP); N=763			
	Eigenvalue	*Δ*	*Proportion*	*Cumulative*
1	5.02	2.61	0.30	0.30
2	2.41	0.26	0.14	0.44
3	2.15	0.19	0.13	0.56
4	1.96	0.17	0.12	0.68
5	1.79	0.89	0.11	0.78
6	0.90	0.21	0.05	0.84
7	0.69	0.19	0.04	0.88
8	0.51		0.03	0.91

	PANEL E-12. Principal Components Analysis							
	The PINCOMP Procedure Results							
	Eigenvectors; Stressed Primary County Areas (SP); N=763							
	PC(PS)1	*PC(PS)2*	*PC(PS)3*	*PC(PS)4*	*PC(PS)5*	*PC(PS)6*	*PC(PS)7*	*PC(PS)8*
POP1	0.09	0.35	0.48	0.05	-0.24	-0.18	-0.02	-0.03
POP2	0.06	0.30	0.47	0.07	-0.24	-0.38	-0.11	-0.01
POP3	0.15	0.37	0.18	-0.19	0.20	0.32	0.25	-0.25
POP4	-0.10	-0.28	0.21	0.22	-0.23	0.17	0.76	0.18
POP5	-0.28	0.09	0.06	0.38	0.14	0.27	-0.29	0.10
POP6	0.07	-0.06	-0.08	-0.62	-0.05	-0.17	0.16	0.13
HZ1	-0.35	0.19	0.07	0.27	0.10	0.14	0.03	0.02
HZ2	-0.16	0.42	-0.23	-0.16	0.20	-0.08	0.19	-0.34
EDU	0.19	0.35	-0.05	-0.14	0.14	0.47	-0.07	0.38
EMP1	0.35	0.05	-0.12	0.31	0.23	-0.14	0.15	-0.16
EMP2	0.06	0.35	-0.28	0.17	0.12	-0.37	0.22	0.65
EMP3	0.33	-0.07	-0.20	0.30	0.11	-0.24	-0.05	-0.18
EMP4	0.40	-0.05	0.01	0.16	0.11	0.07	0.12	-0.17
PCI	0.38	0.06	0.06	0.06	-0.16	0.28	0.07	0.01
SSP	0.34	-0.11	0.00	-0.04	-0.24	0.15	-0.33	0.24
DIV	0.18	-0.18	0.39	-0.07	0.47	0.00	-0.02	0.13
POV	-0.08	-0.21	0.34	-0.10	0.55	-0.17	-0.03	0.15

PANEL E-13. Principal Components Analysis						
The MEANS Procedure Results						
Stressed Non-Primary County Areas (SNP)						
Variable	*μ*	*σ*	*SE*	*V*	*N*	*CV*
POP1	59201.398	81693.507	2628.445	6.674E+09	973	137.993
POP2	10171725777	3.8084E+10	1.23E+09	1.45E+21	973	374.413
POP3	130.68	267.338	8.601	71469.726	973	204.575
POP4	4.974	7.645	0.246	58.444	973	153.701
POP5	0.294	0.045	0.001	0.002	973	15.275
POP6	0.126	0.025	0.001	0.001	973	19.550
HZ1	2.853	0.298	0.010	0.089	973	10.447
HZ2	0.404	0.287	0.009	0.082	973	71.074
EDU	0.043	0.030	0.001	0.001	973	69.984
EMP1	0.403	0.158	0.005	0.025	973	39.133
EMP2	0.076	0.058	0.002	0.003	973	76.439
EMP3	0.062	0.033	0.001	0.001	973	53.967
EMP4	0.076	0.043	0.001	0.002	973	56.642
PCI	18793.686	3807.808	122.514	14499402	973	20.261
SSP	669.515	1556.987	50.095	2424209.5	973	232.555
DIV	3178.595	1068.533	34.379	1141762.9	973	33.617
POV	0.18	0.086	0.003	0.007	973	47.454

PANEL E-14. Principal Components Analysis

The PRINCOMP Procedure Results

Correlation Matrix; Stressed Non-Primary County Areas (SNP); N=973; V=17

	POP1	POP2	POP3	POP4	POP5	POP6	HZ1	HZ2	EDU	EMP1	EMP2	EMP3	EMP4	PCI	SSP	DIV	POV
POP1	1.00	0.91	0.79	-0.17	-0.22	0.02	-0.19	-0.05	0.31	0.25	0.16	0.31	0.46	0.47	0.01	-0.17	-0.30
POP2	0.91	1.00	0.78	-0.10	-0.18	0.03	-0.14	-0.01	0.24	0.22	0.09	0.21	0.38	0.36	0.01	-0.07	-0.18
POP3	0.79	0.78	1.00	-0.15	-0.18	-0.02	-0.13	-0.03	0.30	0.22	0.19	0.22	0.34	0.40	0.01	-0.13	-0.24
POP4	-0.17	-0.10	-0.15	1.00	0.07	-0.14	0.10	-0.13	-0.19	-0.16	-0.16	-0.11	-0.16	-0.09	-0.01	0.01	0.02
POP5	-0.22	-0.18	-0.18	0.07	1.00	-0.34	0.69	0.39	-0.01	-0.26	-0.11	-0.28	-0.40	-0.49	-0.10	0.25	0.42
POP6	0.02	0.03	-0.02	-0.14	-0.34	1.00	-0.48	0.08	0.01	-0.02	-0.14	0.05	0.15	0.16	0.01	0.04	-0.04
HZ1	-0.19	-0.14	-0.13	0.10	0.69	-0.48	1.00	0.58	0.04	-0.20	0.01	-0.29	-0.44	-0.64	-0.09	0.23	0.50
HZ2	-0.05	-0.01	-0.03	-0.13	0.39	0.08	0.58	1.00	0.00	-0.16	-0.01	-0.19	-0.31	-0.52	-0.10	0.07	0.37
EDU	0.31	0.24	0.30	-0.19	-0.01	0.01	0.04	0.00	1.00	0.15	0.17	0.12	0.21	0.24	-0.02	0.07	-0.01
EMP1	0.25	0.22	0.22	-0.16	-0.26	-0.02	-0.20	-0.16	0.15	1.00	0.55	0.77	0.76	0.47	-0.02	-0.22	-0.37
EMP2	0.16	0.09	0.19	-0.16	-0.11	-0.14	0.01	-0.01	0.17	0.55	1.00	0.30	0.24	0.26	-0.03	-0.24	-0.29
EMP3	0.31	0.21	0.22	-0.11	-0.28	0.05	-0.29	-0.19	0.12	0.77	0.30	1.00	0.80	0.49	-0.01	-0.22	-0.38
EMP4	0.46	0.38	0.34	-0.16	-0.40	0.15	-0.44	-0.31	0.21	0.76	0.24	0.80	1.00	0.64	0.01	-0.20	-0.41
PCI	0.47	0.36	0.40	-0.09	-0.49	0.16	-0.64	-0.52	0.24	0.47	0.26	0.49	0.64	1.00	0.04	-0.27	-0.65
SSP	0.01	0.01	0.01	-0.01	-0.10	0.01	-0.09	-0.10	-0.02	-0.02	-0.03	-0.01	0.01	0.04	1.00	-0.06	-0.07
DIV	-0.17	-0.07	-0.13	0.01	0.25	0.04	0.23	0.07	0.07	-0.22	-0.24	-0.22	-0.20	-0.27	-0.06	1.00	0.87
POV	-0.30	-0.18	-0.24	0.02	0.42	-0.04	0.50	0.37	-0.01	-0.37	-0.29	-0.38	-0.41	-0.65	-0.07	0.87	1.00

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PANEL E-15. Principal Components Analysis				
The PRINCOMP Procedure Results				
Eigenvalues of the Correlation Matrix; Stressed Non-Primary Areas (SNP); N=973				
	Eigenvalue	*Δ*	*Proportion*	*Cumulative*
1	5.34	2.97	0.31	0.31
2	2.37	0.59	0.14	0.45
3	1.78	0.30	0.10	0.56
4	1.48	0.29	0.09	0.65
5	1.19	0.19	0.07	0.72
6	1.00	0.06	0.06	0.77
7	0.94	0.22	0.06	0.83
8	0.72	0.03	0.04	0.87
9	0.69		0.04	0.91

PANEL E-16. Principal Components Analysis									
The PINCOMP Procedure Results									
Eigenvectors; Stressed Non-Primary County Areas (SNP); N=973									
	PC(NPS)1	*PC(NPS)2*	*PC(NPS)3*	*PC(NPS)4*	*PC(NPS)5*	*PC(NPS)6*	*PC(NPS)7*	*PC(NPS)8*	*PC(NPS)9*
POP1	0.29	0.39	-0.22	-0.15	0.02	-0.07	0.08	-0.07	-0.02
POP2	0.24	0.42	-0.26	-0.14	0.06	-0.11	0.16	-0.08	0.07
POP3	0.25	0.40	-0.20	-0.17	0.02	-0.02	0.02	-0.10	0.10
POP4	-0.08	-0.14	-0.01	-0.28	0.53	-0.31	0.20	0.55	0.40
POP5	-0.26	0.26	0.23	-0.07	0.09	-0.01	0.01	0.10	-0.33
POP6	0.08	-0.17	-0.36	0.36	-0.44	-0.18	0.13	0.34	0.20
HZ1	-0.27	0.35	0.32	-0.11	0.03	0.01	0.08	0.10	-0.04
HZ2	-0.18	0.31	0.12	0.04	-0.52	-0.18	0.28	0.25	0.07
EDU	0.11	0.28	-0.01	0.17	0.02	0.35	-0.54	0.62	-0.10
EMP1	0.30	0.02	0.42	0.24	0.05	-0.03	0.17	-0.01	0.08
EMP2	0.17	0.09	0.44	-0.02	-0.15	0.18	-0.19	-0.16	0.70
EMP3	0.30	-0.02	0.31	0.26	0.11	-0.13	0.27	0.10	-0.23
EMP4	0.35	0.01	0.13	0.27	0.13	-0.08	0.19	0.08	-0.22
PCI	0.36	-0.10	-0.08	0.01	0.14	0.05	-0.20	0.05	-0.03
SSP	0.02	-0.08	-0.11	-0.11	0.02	0.80	0.55	0.13	0.04
DIV	-0.19	0.17	-0.19	0.54	0.37	0.07	-0.01	-0.16	0.19
POV	-0.31	0.22	-0.10	0.42	0.18	0.03	0.10	-0.11	0.15

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**PANEL E-17 - Principal Components Scree Plot; Primary Counties Areas (P)**
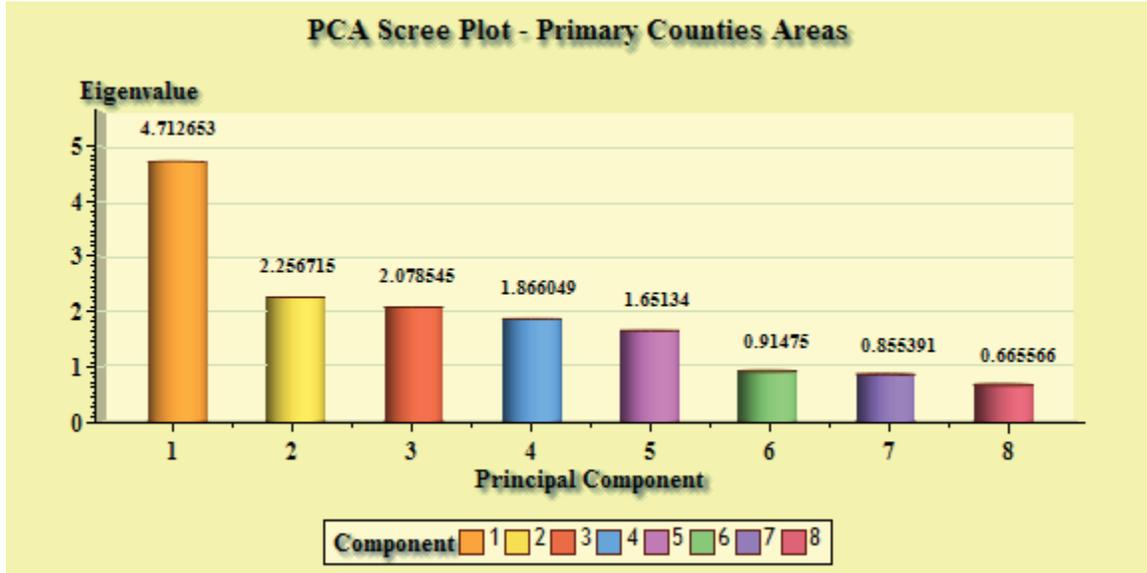
**PANEL E-18 - Principal Components Scree Plot; Non-Primary Counties Areas (NP)**
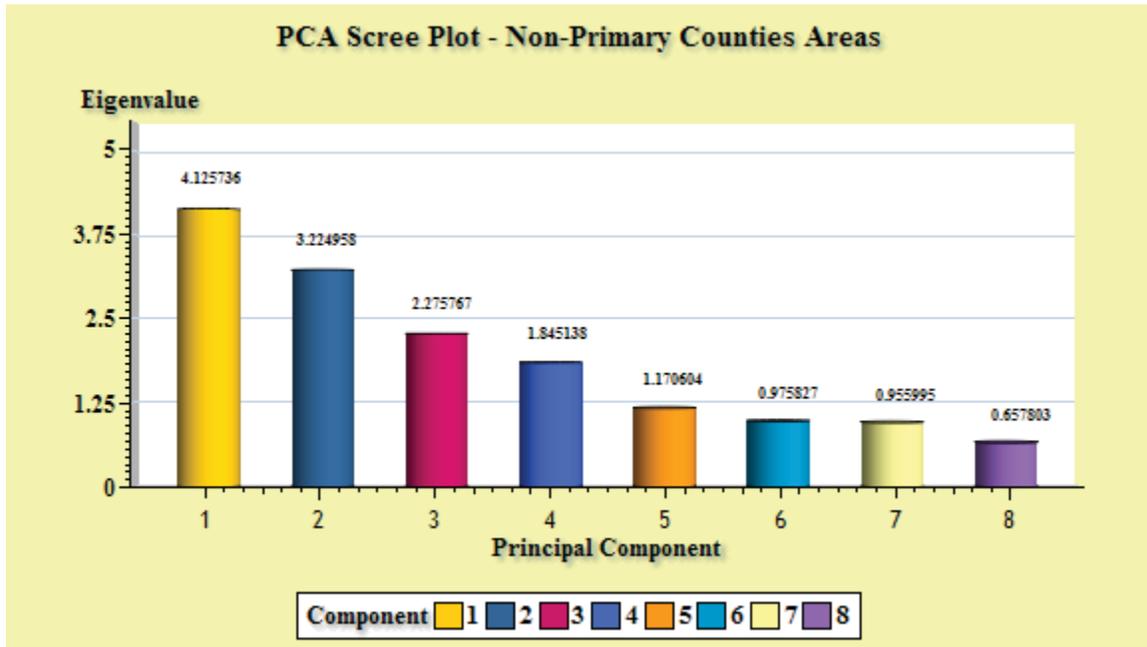
PANEL E-19 - Principal Components Scree Plot; Stressed Primary County Areas (PS)
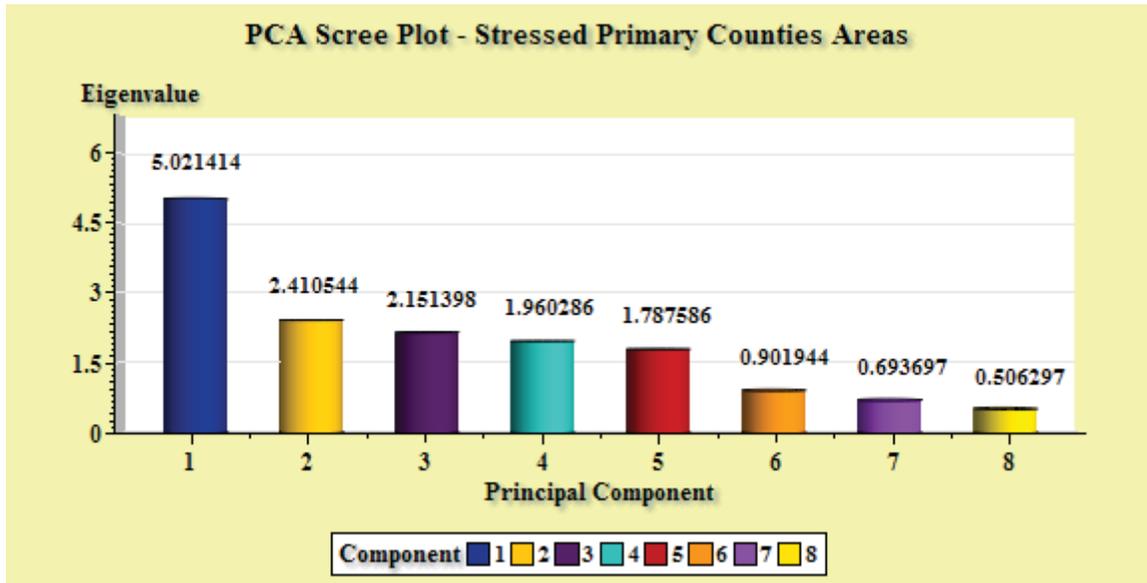
PANEL E-20 - Principal Components Scree Plot; Stressed Non-Primary County Areas (NPS)
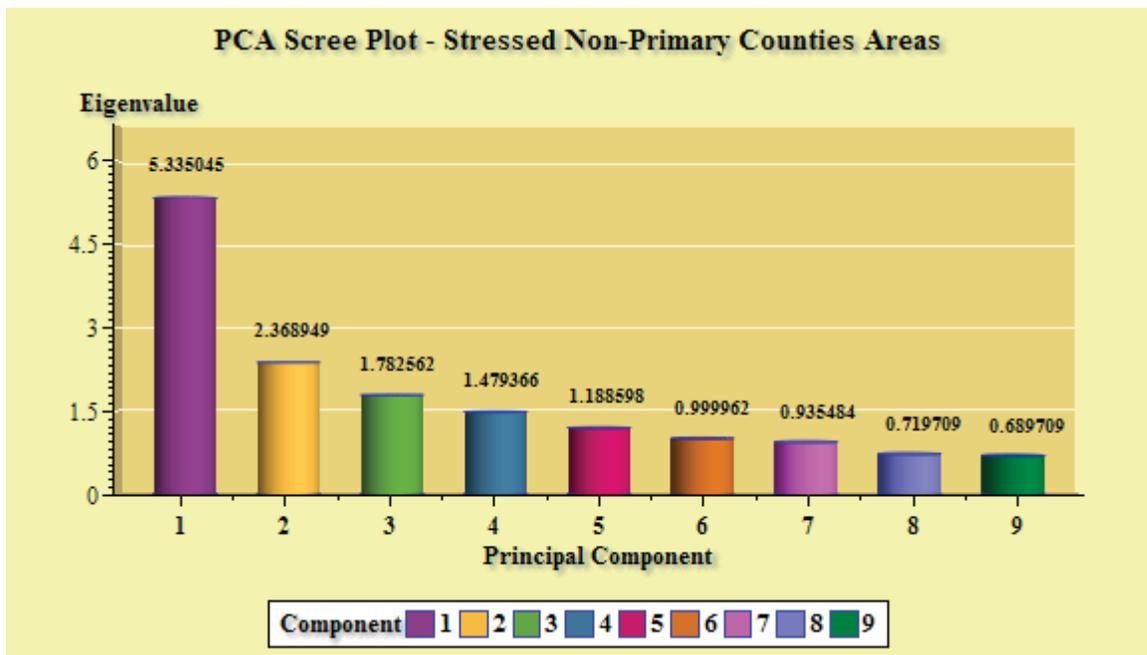
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