The Total Fiscal Effects Index (T.F.E.I.). Building a Dependent Variable to Gauge the Long-Term Fiscal Consequences of Using Economic Discretionary Incentives Packages to Lure Businesses: The Auburn, Huntsville, Montgomery, and Mobile Cases

by

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Abstract

Discretionary economic incentives have been a policy tool widely used by local governments to bring business to their jurisdictions to create jobs and foster economic development. However, businesses have managed to pit local governments against each other and made them compete under the promise of locating within the jurisdiction of the highest bidder. Thus, the winning locality can doom its public finances by elevating its bid through an excessive economic incentive package. That is, by trying to spur a virtuous cycle of economic development, localities can fall into a harmful cycle of economic development. To know if their past decisions were conducive to a fiscal surplus or a fiscal deficit (a winner's curse outcome), local governments must conduct ex-post (post-award) assessments of the long-run consequences of their granted discretionary incentive packages. To this end, this dissertation shows local economic development managers the first and probably most crucial step in doing such an analysis. Hence, four Alabama localities were selected using a combined snowball/criterion nonprobability sampling strategy, and consequently, a total fiscal effects index was built for Auburn, Montgomery, Huntsville, and Mobile, respectively. This index will be a dependent variable in a later research phase to gauge the fiscal consequences of using discretionary economic incentives packages. The results show that the index is a suitable multidimensional dependent variable capable of identifying trends which can be disaggregated for an in-deep scrutiny. Additionally, the results also show that the index is reliable, and valid.

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List of Abbreviations

W.C.	Winner's Curse
DEI	Discretionary Economic Incentives
LEDMs	Local Economic Development Managers
BLS & Co.	Biggins Lacy Shapiro & Company
OCS	Outer Continental Shelf
FIA	Fiscal Impact Analysis
COCS	Cost of Community Services
LOS	Level of Services
CEI	Capacity of Existing Infrastructure
EIA	Economic Impact Analysis
GOB	General Obligations Bonds
IDBs	Industrial Development Bonds
TIFs	Tax Increment Financing Bonds
GASB	Governmental Accounting Standards Board
GAAP	Generally Accepted Accounting Principles
CAFR	Comprehensive Annual Financial Report
MD&A	Management's Discussion and Analysis
BFS	Basic Financial Statements
RSI	Required Supplementary Information
FCA	Financial Condition Analysis
ICMA	International City/County Management Association
T.F.E.I.	The Total Fiscal Effects Index

GFOA	Government Finance Officer Association
DEIE	Discretionary economic incentives expenditure
EWG	East-West Gateway Council of Governments
TFEM	Total fiscal effects modeling

Chapter 1

Introduction, Background Information, and Plan of the Dissertation

Amazon's New Headquarters, Incentives, and Local Economic Development

On November 13, 2018, Amazon announced its decision to select New York City and Northern Virginia (Arlington) for its new headquarters[1]. The press release emphasizes that the company will invest $5 billion and create more than 50,000 jobs across the two new headquarters (more than 25,000 employees each in New York City and Arlington). The announcement also highlighted a ripple effect in job creation, asserting that Amazon's investments in each new headquarters will spur the creation of tens of thousands of additional jobs in the surrounding communities.

"These two locations will allow us to attract world-class talent that will help us to continue inventing for customers for years to come. The team did a great job selecting these sites, and we look forward to becoming an even bigger part of these communities," said Jeff Bezos, founder, and CEO of Amazon. The last section of this press release presented answers Bezos gave to questions regarding this announcement. One question asked what role economic incentives played in Amazon picking these locations and what incentives have been agreed upon. Bezos replied that economic incentives were one factor in their decision—but attracting top talent was the leading driver. Amazon's agreement with these two cities includes information about incentives each location gives and are the only documents posted on the press release.

[1] See the complete press release at https://blog.aboutamazon.com/company-news/amazon-selects-new-york-city-and-northern-virginia-for-new-headquarters

However, a day after Amazon's press release, the radio and television program *Democracy Now!* hosted by journalists Amy Goodman and Juan González conducted a roundtable discussion about Amazon's decision[2]. Thus, the speakers were Ron Kim, a member of the New York State Assembly who had recently written a piece in The New York Times headlined "New York Should Say No to Amazon," Greg LeRoy, executive director of Good Jobs First, a well-known watchdog group on economic development incentives, and Stacy Mitchell, co-director of the Institute for Local Self-Reliance. Next, excerpts of the conversation:

> *Juan González:* Well, we continue to look at Amazon, and corporate welfare as New York and Virginia agree to give Amazon over $3 billion in tax breaks to build new office complexes in New York and near Washington, D.C. . . .
>
> *Greg LeRoy:* . . . Look, we know that the price tag of the incentives alone in New York City is well over $2.8 billion. There's some parts of it we can't even put a price tag on yet . . . It's way too big for a single project. We know that there's unreported subsidies in the Virginia end of the deal, as well, so that the total packages together exceed $4.6 billion. Amazon is clearly, in the way it worded its own press statement, trying to downplay and kind of play a shell game with the numbers and hide some of these bigger numbers that are coming from New York ... It's another example of Amazon getting paid to do what it would have done anyway . . . And we're massively subsidizing, yet again, a company to do what it wants to do anyway.
>
> *Juan González:* Stacy Mitchell, I'd like to ask you about this whole issue of job creation, because the politicians are always touting that it's important to put out these subsidies to be able to create jobs. But one of the unwritten stories I'm thinking you've been tracking is the job destruction. . . .
>
> *Juan González:* Greg LeRoy, I'd like to ask you, in terms of the trend nationwide in terms of these government subsidies for job creation … Could you talk about what these governments, local governments, are doing and what they're getting in return for these subsidies?
>
> *Greg LeRoy:* . . . we know that about four out of five, typically, of the new job takers at a project like this will not be current residents of New York or Arlington. There will be people moving to the area from outside somewhere. And that means a lot of growth

[2] Watch (and read) the complete round table (and its rush transcript) at "democracynow.org" with the headline "As Jeff Bezos Earns $191K Per Minute, Why Are NY & VA Giving Amazon $3 Billion in Corporate Welfare?" November 14, 2018 https://www.democracynow.org/2018/11/14/as_jeff_bezos_earns_191k_per

getting induced, a lot of schools having to be expanded and infrastructure built, and public services provided. Guess who's going to get stuck with that tax bill if Amazon is not paying to help cover the costs of that induced growth.

This whole issue of what we call persistent mega-deals . . . it's a crazy a dynamic. You know, there's a long history in America of a very corporate-dominated site location system . . . Today, we have even a president who has endorsed this race to the bottom, this war among the states, so-called, by sponsoring and assisting Terry Gou, the chairman of Foxconn, when he parlayed that auction last year, whipsawing a bunch of states against each other, for the big subsidy package in Wisconsin.

That Foxconn package now is really melting down. I mean, it was valued at about $3 billion from the state, to begin with. It's now north of $4.7 billion, because there's been a ton of local and infrastructure aid put on top of it.

Amy Goodman: And jobs dropping from 13,000 to something like 3,000.

Greg Leroy: Correct. Yeah, the cost per job keeps going up, because that denominator keeps shrinking. It's the great disappearing deal of all time. . . .

Juan González: I'd like to ask Greg LeRoy, on this, the whole issue of whether Amazon needed to be courted and provided all these subsidies to relocate to New York City.

Greg LeRoy: . . .

. . . We said, publicly, to public officials, Amazon should pay to arrive, not vice versa. . . . If Amazon is going to come and price a bunch of people out of a city and create a bunch of new expenses by inducing so much growth, they should pay to arrive rather than get paid to. . . .

Assemblymember Ron Kim: . . . Imagine . . . investigating into their anti-trust practices. That's leverage. That's real leverage. Instead of doing that, we give them billions of dollars to come to our cities and states. Now, it's still not too late. And I think we should move forward and hold Amazon accountable.

The previous extracts of the discussion are taken from "democracynow.org." They are roughly 20% of the whole conversation, which exemplifies how salient it is and how much preoccupation and public deliberation were spurred due to the granting of generous economic incentives packages to Amazon. This practice has been around for the last three decades, which has resulted in competition among states and localities to lure companies hoping that these

companies will bring new jobs. Amazon's new headquarters exemplifies this long-lasting and controversial economic development policy.

Meanwhile, many stakeholders such as scholars, developers, public officials, media outlets, and watchdog groups have argued for quite a while, firstly that in the long-run incentives do not pay their way, and secondly, that incentives set states and local governments into a harmful cycle of economic development. Hence, the previous extracts of the discussion are excellent examples of such arguments against incentives and represent a perfect introduction to the debate to which this dissertation is contributing. These extracts are thus a table of contents of the issues that will be analyzed here.

Special attention deserves the question asked by González and its corresponding answer given by LeRoy about the role played by local governments. LeRoy's response emphasizes that once firms locate in their new locality (in the case of Amazon New York and Arlington), instead of pulling workers out of the ranks of the unemployed, they bring new workers from outside the locality. This wave of new workers puts the local government under fiscal stress, which results in the deterioration of the level and quality of public services provided, experiencing thus cutbacks, for instance. Therefore, such a declaration deserves a more in-depth examination and is one of the main topics to be analyzed here.

Amazon's last headquarters is an excellent example of what the watchdog group Good Jobs First calls mega-deals (for the size of its monetary value). Nonetheless, mega-deals will not be the primary type of incentives studied here; this dissertation is about measuring the impact of discretionary economic incentives. Moreover, the focus will be on local governments. Due to their size, mega deals often involve states and local governments negotiating, crafting, and

granting the incentive package; sometimes, even the federal government is involved. This dissertation is, however, about measuring discretionary economic incentives negotiated, drafted, and given by local governments along with its long-run total fiscal effects consequences for local governments.

For example, years ago, at the inception of this dissertation, not notably salient local-level examples existed in the state of Alabama. However, during the Fall of 2022, AL.com[3] reported about the city of Mobil getting a Topgolf entertainment complex along Interstate 65 at the McGowin Park shopping center. This news caught much attention from all population sectors because of how the deal was being crafted. Not surprisingly, the debate narrative pulled in opposite directions. On the one side, enthusiastic supporters of the project stressed all potential economic development gains for the city and the region if the deal materializes. For instance, the project was announced as a $22 million development, with 60 hitting bays, creating 150 new jobs for the region. Additionally, economic benefit for local contractors and vendors was praised. Also, it is believed that an economic spur will ensue for its potential to attract tourists from surrounding areas such as Mississippi and Florida.

On the contrary, AL.com was reporting how to ensure the project, the Mobile County Commission and the City Council would have to commit 1.25 million each in direct economic incentives. Hence, the media outlet highlighted that if materialized, the golf driving range game with electronically tracked golfballs and automatically scored drives company would make Mobile its third location in Alabama. Nonetheless, to add insult to injury, Huntsville and Birmingham city officials have not paid any direct incentives for their Topgolf facilities. So why

[3] The Alabama Media Group website comprises The Birmingham News, the Press-Register of Mobile, and The Huntsville Times. All information about this case was published from August 18th to the 22nd, 2022.

would Mobile commit such much money to secure the deal? Even worse, such an important decision that, given the public nature of the funds, concerns each taxpayer fell on the three Mobile County Commission members and the seven City Council members.

Each local institution separately voted on the decision. Only one county commission member voted no, and the county commission approved granting their respective 1.25 million in a two-to-one vote. Similarly, the seven city council members approved their share of the commitment and unanimously awarded 1.25 million to Topgolf through economic incentives. Thus, the total monetary value of the economic incentive package offered to Topgolf was $2.5 million. Of notable concern is that nobody mentioned technical analysis as part of the decision to either award or deny this economic incentive package. No ex-ante (before award or evaluation) or ex-post (after award or evaluation) analysis was part of the decision-making process despite the rich literature on these tools. Moreover, no clawback mechanisms were ever reported.

The obvious question is, was this a good or a wrong decision, and why? As this investigation will widely document in the following chapters, the total effects of this type of action will not be felt until the years to come. If this effect turns out to be negative, it will take the form of a fiscal deficit; conversely, if the effect is positive, it will take the form of a fiscal surplus. If it contributes to a fiscal deficit, will the company or the nine local authorities approving the incentive package be held responsible for the negative consequences? The stakes are noticeably high! For this reason, this investigation aims to prevent this from happening again by showing local authorities the starting point of a post-award evaluation technique.

Such a post-ward evaluation technique is challenging because of the lack of a measurement device that can truly reflect the long-term effect of using economic incentive

packages. Hence, the research question that this dissertation is aimed to answer is: how to measure the long-term total fiscal effects for localities using discretionary economic incentives to lure business? Answering this question would allow us also to answer other closely related questions, such as: Is using discretionary economic incentives a good or bad economic development policy? Is this policy a winner's curse (understood as a long-term fiscal deficit) in economic development? Before starting, examining some relevant context and background information is necessary.

Incentives, a Contested Tool in Economic Development Policy

One of the most controversial policies regarding economic development is the provision of discretionary economic incentives (which include tax instruments and non-tax instruments). Incentives are controversial because of the lack of consensus in the assessment of their efficacy and their long-term impact (Hissong 2003, and Peters and Fisher 2004). However, once a company has decided to locate or relocate and has narrowed its search to no more than four places, it is believed that incentives play a crucial role (tipping the balance) in the company's decision. For this reason, state or local governments desperately use incentives when a company knocks at their doors.

Consequently, it has been argued that state or local governments fall into a sort of competition (business recruitment) characterized by uncertainty and incomplete information where they must play against each other strategically. Furthermore, the dynamic of this interplay between site selection (on the firm's side) and business recruitment (on the government side) can be seen and analyzed as an auction-like situation (Jarrell et al. 2011; Robbins and Miller 2006; and Rosentraub and Swindell 2002). Auction literature warns and widely documents the

existence of a phenomenon called “Winner’s Curse” (W.C.), where the bidders fail to recognize the fact that the winning bidder’s estimation of the item is an upward-biased estimate of its actual (but unknown) value. Hence, auction winners are cursed by paying more than the real value of an object.

Using this theoretical framework, states and local governments are the bidders, while companies are the auctioneers. Thus, state and local governments should scrutinize and learn how to design their incentives policy to avoid falling into the W.C. Otherwise, the winner of the auction will overpay (by offering economic incentives in excess) in exchange for the value of the asset auctioned (jobs and all other expected benefits that come with a firm when it locates within state or local legal boundaries).

The interplay between site selection and business recruitment is a topic that catches widespread attention because it has triggered an unresolved debate regarding using economic incentives. Far from moving toward consensus, the discussion has exponentially escalated because studies have shed contradictory and unconvincing results about the efficacy and effectiveness of using economic incentives. Nevertheless, economic incentives have been extensively diffused nationally, triggering thus a bitter war between states and localities. Critics have argued that if discretionary economic incentives are inefficient tools to lure business (as many scholars, public media, and practitioners have stated), then they are equal to a significant loss of public funds, which could have been better used to finance and enhance public welfare (Ellis, Hayden, and Rogers 2014).

Despite this broadly used analogy of a W.C. outcome by giving away discretionary economic incentives, few studies use W.C. as a theoretical framework to analyze the incentives

problem. Jarrell et al. (2011), Robbins and Miller (2006), and Rosentraub and Swindell (2002) are three examples of scholars using auction theory and W.C. insights in the context of the use of economic incentives to lure business. However, an in-depth review of the W.C. scholarly work reveals that this phenomenon is not the natural outcome of a common-value and sealed-bid auction, as much as it is the consequence of overestimation practices embedded in this type of auction. In this research, overestimation occurs when local governments bid to entice a firm and end up granting an incentive package whose monetary value is more significant than the future expected benefits the company brings. Thus, this research focuses on measuring whether overestimation after giving discretionary incentive packages has occurred.

Pros and cons of incentives

CB Richard Ellis CBRE Group, Inc. (2010) asserted that economic incentives "vary from state to state by type, availability, target industries, performance metrics, and payment methods. Business recruitment in the U.S. is highly competitive. As companies become increasingly mobile and indifferent to location, economic incentives can make the difference between winning or losing." Chi and Hofmann (2000) explain the pros and cons of incentives as follows: pros 1) incentives have a positive effect on business location, 2) incentives finance job creation, 3) incentives are cost-effective, 4) incentives help foster competitiveness, and 5) incentives have a political element. On the other hand, cons are that 1) tax and financial incentives are not the only factors considered in business-location decisions, 2) incentives raise questions of inequity, 3) empirical studies show that business incentives are not cost-effective, 4) incentives pull dollars away from the improvement of public services and infrastructure, and 5) incentives create a self-defeating zero-sum game. These pros and cons summarize the debate after several decades of the policy experimentation with incentives and academic research about incentives. On the

academic side, the vast myriad of theories, instruments, data, and methodological approaches chosen by scholars make it extremely difficult to resolve the debate or at least reconcile findings, despite hundreds of scholarly studies (Buss 2001).

Discretionary incentives, customized incentives, or deal-closing funds?

Chi and Hofmann (2000) and Burnett (2011) conclude that interstate competition for industries and businesses has evolved into a bidding war, especially with what is known as discretionary economic incentives (DEI), also known as customized incentives or deal-closing funds. Thus, CB Richard Ellis CBRE Group, Inc. (2010) defines DEI as "incentives offered on a case-by-case basis for strong economic development prospects projected to generate a significant economic and fiscal impact on the state and the community."

Weisfuse (2012) declared that "[d]eal-closing funds are targeted toward businesses that can demonstrate that additional funding is needed to close a competitive cost gap relative to other states or localities that are also vying for the same economic development project." He also adds that "unlike other discretionary and as-of-right incentive packages that centralized state economic development agencies approve, governors are typically given broad discretionary power in determining the awardees of the deal closing funds. Some states also involve the leaders of one or two legislative bodies or boards of gubernatorial appointees." Moreover, Biggins Lacy Shapiro & Company elucidates that:

> A significant factor in obtaining discretionary incentives is the perceived value of the project to the public sector. Objectively, this is demonstrated by the number and salary levels of jobs retained, increased or attracted, and by the amount of direct and indirect tax revenues generated by the operations of the project. Subjective factors are also considered, such as the strategic value of a benefited company or project (i.e., is it an industry leader, is it a catalyst for other jobs or construction, will it provide needed facilities for an important industry). Another important, sometimes critical factor is the amount of competition for a particular company or project from other jurisdictions. In

> almost all cases, discretionary incentives are available only if 'inducements' can be shown, i.e., the project would not have proceeded without the incentives. Most states now favor 'discretionary,' rather than 'as of right' programs because it enables the government to have more flexibility in targeting limited resources towards those industries or companies that are most important to a community and controlling the terms of the incentives granted. (BLS & Co. 2015)

CB Richard Ellis CBRE Group, Inc. (2010) illustrates that the most commonly used customized incentives are: real and personal property tax abatements, cash grants, corporate tax credits, sales tax refunds, training grants, building permit waivers, infrastructure grants, forgivable and low-interest loans, donated land, free or subsidized parking facilities, equipment grants, low interest, equipment loans, utility cost reductions, low-interest bond offerings, and public financing. In short, Kindel (2014) defines DEI as "economic incentives, which are typically negotiated with public officials or other designated parties in exchange for a defined scope of company activities, such as capital expenditure or job creation or retention." To this regard, Blair and Carroll (2008) state that DEI "provide local development official with choices regarding the type or size of an incentive they may wish to extend to a particular business."

However, Blair and Carroll (2008) also warn about the disadvantages of this type of economic incentive package. Two of which are that "government officials must make decisions regarding the business potential of firms seeking subsidies," and they also add that "[g]overnment bureaucrats may not be able to make such decisions accurately." The other is that DEI "also carries the potential for petty and large corruption." Hence, from now on, discretionary economic incentives, customized incentives, or deal-closing funds will be taken as synonymous. Thus, the term DEI will encompass all.

Regardless of its precise definition, one of DEI defining features is that it allows a direct negotiation between the firms and the local governments, where both sit at the table, and the

firms can ask according to their needs. In contrast, the local governments can decide what to offer or grant. This process is interactive and is conducted in several stages. In the semifinal stage, the firm and local or state's government representatives —including, sometimes, local economic development practitioners and other local economic development stakeholders such as but not limited to a public-private partnership, chambers of commerce, and other business associations, which along with government I will collectively call from now on, Local Economic Development Managers (LEDMs) — sit at the table to negotiate the "incentive package bid." Furthermore, at this point, the firm has conducted a thorough search and selected one or two more site prospects, which puts LEDMs in a disadvantaged position. First, this disadvantaged position is because they do not know against whom they are competing, and secondly, they completely ignore the others' bids.

The fact that LEDMs are competing with other prospectus sites without full knowledge of the details of the negotiations between the firm and the other prospectus candidates should make clear the logic of the predicament faced by LEDMs. On the one hand, it is precisely in this stage that DEI gathers momentum as the critical instrument in the hands of LEDMs to tip the balance in their favor. On the other hand, given the circumstances, their common sense seems to dictate that the only way to entice the firm is by elevating the bid as much as LEDMs can. Regrettably, this action triggers the W.C. effect. As it can be inferred, LEDMs have very few (if any) tools and possibilities to be the primary beneficiary of the negotiations. In other words, the LEDMs seem cursed to lose most of the time (Ellis, Hayden, and Rogers 2014).

Chapters' Preview

With this background information, the second chapter outlines the literature review and the empirical theory. The literate review illustrates debates and ideas in the literature about how

incentives have been analyzed using auction-like and winners' curse theory that can be used to develop empirical theory. The empirical theory delves into how fiscal impact analysis concerning incentives can be helpful. It also creates expected causal paths and directions and culminates with succinct research expectations.

Chapter three begins with an overview of the research question and a testable hypothesis, followed by the research design approach and justification. The research design section covers the identification of the population, unit of observation, unit of analysis, and sampling; it also covers the identification of sources of data as well as a discussion of the measurement instrument. This measurement instrument is the total fiscal effect index (T.F.E.I.). The T.E.E.I. will serve as the dependent variable to measure the relationship between discretionary economic incentives and their fiscal effects on localities' finances after granting incentive packages. Then, data analysis will be discussed, and the chapter culminates in acknowledging potential methodological limitations.

Chapter four presents the construction of four T.F.E.I, one per each of the Alabama cities under study, Auburn, Montgomery, Huntsville, and Mobile. It shows a graphical representation of each index, tables containing all relevant information used to build each index, and the calculation of its constitutive parts. The main goal of this chapter is to lay out criteria to judge the measuring usefulness of the index as a dependent variable. Moreover, criteria to evaluate the quality of the index in terms of reliability and validity are also laid out. Throughout preliminary inspections searching for positive trends (fiscal surplus) or negative trends (fiscal deterioration or winner's curse outcome), this chapter exemplifies the multidimensional properties of the index. In other words, it shows how, throughout a disaggregating process (backward induction

analysis), the index can be a rich source of detailed explanation of the impact of economic incentives on localities' finances.

Chapter five starts with a comprehensive but straight summary of the dissertation. The discussion concerns what was expected, how it was approached, and what was found. Then, a discussion of the following research phase outlines a proposed approach to gathering data on the independent variable. Finally, a concluding thoughts section outlines some implications for ideas, concepts, and practices.

Chapter 2

Literature Review and Empirical Theory

The Literature Review

The market for jobs, auction-like scenarios, and local economic development

Blair and Carroll (2008) asserted, "local economic development policies may be thought of as attempts to purchase jobs and the related benefits associated with economic growth by offering business a wide variety of subsidies." According to BLS & Co., other related benefits of luring firms are for example "direct and indirect tax revenues generated by the operations of the project, and the strategic value of a benefited company or project (i.e., is it an industry leader, is it a catalyst for other jobs or construction, will it provided needed facilities for an important industry)." Moreover, Markusen (2006) asserts that "[t]he markets for jobs approach accepts the necessity for governments to compete for capital and to use tools at hand in pursuit of jobs and community well-being." She also emphasizes that:

> The jobs created also generate higher incomes for residents, who, in turn, spend the additional income on local goods and services that generate yet other jobs and are invested in housing that generates real estate taxes. Jobs and expanded tax capacity are valued by residents, local-serving businesses, and politicians (for their announcement value). Competing governments can be characterized as competing for jobs and tax base, and firms looking for sites as supplying them, in some cases for economic rents.

Nevertheless, this market for jobs and other expected benefits has a particular and unique dynamic and synergy with the following features:

1) It is infrequent with one seller (firms) per occasion, which might appear to offer its product unexpectedly (just like a door-to-door salesperson).
2) A reduced number of buyers or consumers (localities wanting to lure firms) once a firm has selected its targeted localities.
3) Transactions take place in an environment where the seller knows more about the prospective buyers than what the buyers know about the seller[4].
4) The prospective buyers poorly estimate the value, cost, and price of jobs and other expected benefits.
5) The seller meets with one buyer at a time, but the buyers never meet and therefore they not only do not know each other, but they also ignore how much each one offers
6) The final price paid (the DEI package) is not predetermined but is agreed upon as a result of a bargaining process.

In a more formal description, Adreff (2014) depicts this as a situation where:

> [an] entity [that] operates as a monopoly on the supply side of a market, usually adopts a strategy that aims at maximizing its monopoly rent without being accused (or sued) for the use of discretionary economic power. One option for this monopoly is to fuel an intense competition on the demand side among those economic agents interested in its exclusive product or service, in particular when these competitors are few or not in a significant number. A monopoly's tool often used is to create an auction-like situation or resort to an actual auction through which demanders will bid against each other up to the maximum price acceptable for the most optimistic bidder; this price determines the maximum monopoly rent that [this] entity could reach. Here comes the issue of a possible winner's curse whenever the market value of the object is unknown ex-ante (before the bid).

[4] Hired consultants or site seekers assist the site selection process that firms often use. Site seekers' specialty is to collect and analyze information (based on the firm's needs) on what jurisdictions have to offer (most important site-selection factors for firms). Site seekers also select and rank which jurisdictions are the most suitable alternative locations to narrow down the search to few prospects so that firms can target those prospects. By the time the firms knock at LEDMs' doors, the firm already knows very well all prospective locations (Markusen and Nesse 2007).

Therefore, the market structure that most closely represents this market for jobs and other expected benefits in a local economic development context is an auction-like scenario, specifically a common-value and sealed-bid auction. In this scenario, firms are the auctioneers who try to sell job creation along with other future potential economic benefits expected when they locate within a governmental legal boundary. Governments are bidders or prospective buyers of a certain number of jobs and other future expected economic benefits that a firm brings to its new location.

When publicly discussing the use of DEI in media outlets, practitioners, and some pundits have denounced the presence of a W.C. outcome; that is, they have stated that LEDMs ended up overpaying by giving away more of what the firm brings into the locality when they move in or decides to stay or expand after negotiating and accepting the DEI package. Nonetheless hitherto, none of them has taken the task neither the challenge of scientifically prove a generalized existence of a W.C. beyond case studies. In other words, up to now, W.C. is a widely used metaphor to describe and criticize some doubtful deals negotiated and signed by LEDMs.

Thus, the question remains: is the W.C. prowling and hunting LEDMs by cursing localities by transferring their well-being into the pockets of the firms' owners and stakeholders? The only way to know if the threat of the W.C. is real is by scientifically testing its existence, which can be done by applying an auction-like approach to the use of DEI in local economic development. Answering this question will contribute to advance the debate on how to avoid the W.C. outcome in the LED context.

Auctions and the winner's curse

Hence, at this point, it is pertinent to set a simple and intuitive theoretical framework of the W.C. Varian (2010), explain that "the problem of the W.C. stems from the fact that the bidder who wins was too optimistic, overvaluing the good." This author formally explains W.C. as follows. The estimated value of bidder i is $v + e_i$, where v is the true common value, and e_i is the "error term" associated with bidder i's estimate. In this case, the person with the highest value of e_i, e_{max}, gets the auctioned good. Nevertheless, if $e_{max} > 0$, this person is paying more than v, which is the true value of the good. To this subject, Andreff (2014) asserts that in:

> [In a] *common value auction* the item to be sold has a single objective value for all bidders, but this true value is unknown. Each bidder has to guess the item's true value at the time of bidding based on the available information, and without knowing the other's guesses. The items won, however, are more often than not those whose value has been overestimated. The winner's curse exists in these common value auctions when bidders fail to account for the fact that the winning bidder's valuation of the object is an upward-biased estimate of its true (unknown) value. Auction winners are cursed by having paid more for investing in an item than its true value.

Thaler (1989), in turn, defines the W.C. as follows, "[in an auction] the winner can be said to be 'cursed' in one of two ways: (1) the winning bid exceeds the value of the [item], so the [bidder] loses money; or (2) the value of the [item] is less than the [bidder's] estimate, so the winning [bidder] is disappointed." Thaler proposes to call W.C. versions 1 and 2, respectively. Later, he adds, "the milder version 2 can apply even if the winning bidder makes a profit, as long as the profit is less than expected at the time the bid was made. In either version, the winner is unhappy about the outcome, so both definitions seem appropriate."

As a topic of study, the W.C. began with the seminal work of Capen, Clapp, and Campbell (1971), three petroleum engineers who claimed that oil companies suffered unexpectedly low returns "year after year" in early Outer Continental Shelf (OCS) oil lease

auctions. Ever since its inception, the topic has been the subject of much academic scrutiny and, as Kagel and Levin (2008) have claimed, "[it] is exceedingly difficult to support claims of a [W.C.] with field data because of data reliability problems and plausible alternative explanations. The ambiguity inherent in interpreting field data, and the controversial nature of the W.C., provided the motivation for experimental investigations." Thenceforth, the W.C. has been extensively analyzed by conducting auctions in experimental settings as well as by using exceedingly complex mathematical treatment (see, for example, Kagel and Levin 2009).

The focus of the experiments (like the treatment in W.C. generally), however, has been the private (business) realm, while the public sector has been considered only as a provider of public information (as illustrated in the work of Kagel and Levi 2009). In this case, the question has been whether the government, when providing public information, helps to mitigate the W.C.? In auction theory, the government has also been considered, precisely because there are many instances in which governments around the world have conducted auctions to sell radio spectrum rights (to mention one example). Thus, the question has been: What kind of auction mechanism should the government design to get more substantial revenue from its bidders?

Although the more extensive W.C. scholarly work stems from the study and analysis of auctions in what is known as auction theory, which is a subbranch of game theory, there has also been some work about W.C. in auction-like scenarios or situations. For example, Anandalingam and Lucas' (2004) book is, for the most part, comprised of different qualitative case studies in business settings in which W.C. has been identified. In their first chapter, they explore and describe the factors that can lead to the W.C. in the business sector. These forces are psychological and personal factors, as well as market factors.

The winner's curse and local economic development

In the economic development literature, there are only three studies where the auction-like approach has been used, which are Jarrell et al. (2011), Robbins and Miller (2006), and Rosentraub and Swindell (2002). In these studies, the government has been portrayed as a bidder in auctions who suffer the W.C. effect. Among these studies, only Rosentraub and Swindell (2002) have asked what kind of bidding strategy should the government play to avoid falling into the trap of the W.C.?

Why is it that the business realm seems to be so concerned about the W.C. while the public sector does not? An intuitive answer is that while business loses revenue (due to the W.C.) and accountability can be enforced, governmental accountability, as well as what the government loses, is not clear. Therefore, it must be asked why the government should be concerned about the W.C. in the context of the LED? A lack of understanding of what government loses when giving incentives in excess is part of the reason why local government fails to take into consideration the W.C. effect when competing with other governments to attract business.

The W.C. in the context of LED manifests itself in the form of suboptimal biddings (by offering more of what they receive in return) when local governments attempt to purchase jobs along with other expected benefits. Suboptimal biddings outcome is a predictable result supposedly derived from the very nature (dynamic, synergy, and features) of the common-value and sealed-bid auction for jobs and other expected benefits resulted from luring businesses. Thus, Rosentraub and Swindell (2002) set a W.C. in LED theory as follows:

> Each time the owners of different forms of capital [jobs and a potential increment of the tax base in Markusen's (2006) words] seek a new location, several communities bid to be the host. As all cities are 'dependent' on capital for the creation of economic development and image, competing cities inadvertently find themselves victims of a

> bargaining process whereby most if not all cities experience an auction-like bidding game. Winning such a bidding game can sometimes lead to a 'winner's curse' when the returns on the public's investment for these economic development opportunities fail to exceed the costs of the package that won. Bidders in such an auction game are played against one another by the owner of the capital good. Bidding is often conducted in the face of limited information about the value of the investment and about the bargaining position of the owner seeking the incentive bids.

Furthermore, Robbins and Miller (2006), who call this approach a competitive bidding theory, add that:

> [M]ultiple governments offer incentives for acquiring or retaining a business firm. The business firm accepts the revenue-maximizing offer. Auction forms have distinguishing features, and these characteristics may relate to the surprising behavior found in competition within localities for economic development. This competition and its resemblance to an auction make the auction an assumption for investigation.

Additionally, Robbins and Miller (2006) continue asserting, "[a]uction theory and experimental research, therefore, can be useful tools to answer the questions about the attribution of rational actor behavior to all the parties in economic development." Consequently, Rosentraub and Swindell (2002), as well as Robbins and Miller (2006), constitute the foundation of the W.C. in LED. Nevertheless, what can be excerpted from all authors mentioned up to here and who have analyzed the W.C. is that its source is the overvaluation of the asset auctioned. Markusen (2006), as well as the BLS & Co. description of the expected benefits of job creation, suggests that it is challenging, if not impossible, to accurately estimate (in monetary terms) the price of a job. Thus, this provokes the confusion that leads to the overestimation that, in turn, leads to the W.C. outcome when negotiating incentive packages with firms. Nevertheless, is the unknown market price of a job the only source of overestimation?

The causes and consequences of the problem

Blair and Carroll's (2008) answer to this question by asserting that there are six reasons why the market for jobs tends to be inefficient (in the economic sense). These reasons are *i*) collective action, *ii*) asymmetrical information, *iii*) vaguely defined product, *iv*) federal subsidies, *v*) subsidy cost versus value and *vi*) considerable variation in product's price. These reasons, as elucidated by Blair and Carroll (2008), are briefly summarized below:

- *Collective action* refers to the possibility that a small group of highly interested persons could influence the government. That would be less costly for individuals represented by existing organizations to influence policy. This collective action reason goes to the heart of the local politics in the sense of how good or bad the political process operates to reflect the interest of citizens at large.
- *Asymmetrical information* refers to the fact that private parties involved in economic development negotiations have incentives to provide selective and distorted information when seeking government assistance. For example, a firm may make it look like it needs a more significant economic incentive than what it requires to locate in an area.
- *Vaguely defined product* refers to the fact that firms usually do not guarantee specific numbers of job characteristics in exchange for incentives. For example, temporary employment is included in the job estimates, and seasonal low-paying jobs are not distinguished from better jobs.
- *Federal subsidies* are programs that encourage cities to offer more for jobs than the benefits received or that subsidize cities competing against each other for the same jobs.

- *Subsidy cost versus value* is when a local community provides a service or infrastructure improvement that costs taxpayers more than they are valued by the firms the community is trying to attract.
- *A considerable variation in the product's price* refers to the fact that data on the cost of a job is fragmented and difficult to obtain. For example, the scattered evidence from various economic development programs shows that cost per job range from over $300,000 per job created to as little as $5,000.

If this were not enough, Ellis, Hayden, and Rogers (2014) explain that human psychology also plays a role that exacerbates the pitfalls of the practice of offering incentives. These psychological difficulties, as elucidated by Ellis, Hayden, and Rogers (2014), are briefly summarized below:

- *Pro-business biases.* This bias is the product of empathy between policymakers and business representatives. Such empathy has been evidenced (Rubin, 1988), and it is intensified when policymakers run a business themselves. Thus, it is very hard that policymakers view companies as having antagonistic interests.
- *Competition neglecting which leads to overconfidence, and over-commitment.* Overconfidence and overcommitment have to do with human's propensity to disregard the strategy component of their decisions. In other words, people want to win when they find themselves in a competition. This human propensity leads to neglect of the plans and skills of their opponents. Therefore, the competition itself undermines the point of the competition.
- *A tendency to lose track of the full cost of actions.* Accurately calculate costs are not an easy task. Even when using a model such as fiscal impact analysis (which considers costs), it

is essential to realize that costs are not linear like the model assumes, for instance, startup costs thresholds can be overpassed when deals get larger.

Shortly, in another but related book chapter, Rogers, Ellis, and Hayden (2014) assert:

> When sympathetic community members propose an incentive package, policymakers quite naturally go along. The purported benefits of the plan will be emphasized, leading to overconfidence in a rosy scenario. This overconfidence, in turn, tempts decision-makers to commit the *planning fallacy* – a tendency to overestimate the benefits of a course of action while underestimating the costs in terms of time, resources, and effort.

Moreover, Ellis, Hayden, and Rogers (2014) assert that it "is a great deal of negative interaction among all of these pitfalls. The real benefits of a deal are often overstated because of the first two pitfalls. The real costs of proposals are underestimated because of the third." As can be seen, the dynamic, synergy, and features of the auction for jobs lead to suboptimal biddings when LEDMs are negotiating DEI packages. This suboptimal bidding has generated an intense discussion where five issues have been denounced and debated. Morgan (2009) asserts that these issues are legality, fairness, efficiency, effectiveness, and accountability. These issues are briefly summarized below as elucidated by Morgan (2009):

- *Legality* refers to the question of whether government incentives given to large companies to entice them to locate within a political entity's borders constitute a legitimate public use of taxpayer money.
- *Fairness* refers to who reaps the benefits and who bears the cost of DEI. On the benefit side, the debate goes to why newcomers get the incentives while exiting business does not, as well as whether local citizens benefit from the newcomers. This last question is related to the size of cost as local taxpayers bear the cost of incentives.

• *Efficiency* is the most studied part of the debate, and it goes directly to the public finance management concern. In other words, this is the most monetized part of the debate. What is the optimal DEI level or package? Suboptimal provision of DEI also means a significant opportunity cost payment, such as the erosion of the tax base and undermining the provision of public service.

• *Effectiveness* refers to whether (and to what extent) DEI influences site selection. Is DEI functioning as enticements or inducements, or are they mere subsidies to business? Moreover, if they are effective at luring firms, are they effective in working for the betterment of the places and people where firms locate?

• *Accountability* refers to whether recipients' firms are held sufficiently accountable to taxpayers and the boarder public interest. It also refers to the secretive nature of early and final DEI negotiations. How are decisions made and reviewed? Whose interests are served, and at what cost? The lack of accountability appears to be a well-established, and implicitly accepted and essential characteristic of the site selection dynamic[5].

For each issue mentioned, there are practical and academic arguments against and in favor of the firms' actions. The same can be said for the public officials' position. Such pros and cons uphold the status quo, in part due to the lack of consensus in research findings, for which the debate is still ongoing. Today, it is still a puzzle to guess the optimal level of DEI. If LEDMs offer to the firm more than the minimum subsidy necessary to attract it or to induce it to expand, then over-subsidization occurs.

[5] Firms usually demand confidentiality during the negotiation process for several reasons. For example, Morgan (2009) illustrates theses reasons as follows *i*) protection of trade secrets to avoid tipping their hands to competitors, *ii*) to avoid information on pending plant closures to leak out, and *iii*) to avoid excessive real estate speculation that might drive up the costs of land acquisitions, and *iv*) to avoid LEDMs excessively targeting firms to move to their localities all the time.

Even worse, the only way to be sure to win the auction is by overbidding. If LEDMs do not overbid, then they might lose the competition or auction. Thus, public officials have minimal (if any) bargaining power when negotiating DEI. Given the circumstances that LEDMs face, they might even be aware of the W.C. phenomenon, but they have nothing to do to protect themselves from this problem. LEDMs might even accept that falling into the W.C. is a requisite or precondition to lure the firm into their boundaries, a sort of necessary evil in attracting and retaining firms and securing the jobs and investment they create. For example, Wolkoff (1992) made a game theory decision tree to show how, for a politician, it is rational to offer fiscal incentives. Such action is taken, although it might be acknowledged that there was only a relatively small chance that incentives would work the way they are supposed to work. To this regard, Bartik (2005) did the following calculations:

> [F]or every ten plants offered such an incentive; the incentive would be decisive for about three of them. The incentives given to the other seven plants would have no effects on business location or employment growth. The only effect would be an extra cost to state and local governments of these unneeded seven incentives. Unless economic developers can somehow determine which of the ten plants 'needs' the incentive to tip its location decision, this loss on seven of the ten plants is a necessary cost to tip the location decision of the other three plants.

For this reason, scholars have tried to advance the debate by proposing all kinds of reforms or changes from which the work of Ledebur and Woodward (1990), Peters (1993), Weber (2002), Ziance (1998), Bartik (2005) and LeRoy (2007) excel. All proposals of these authors are well-grounded in years of research and observation. However, most of them suffer from two problems. First, many of them address only one or a couple of the issues described by Morgan (2009), but not all of them. Second, any attempt to reform or change the well-established rules of the game between firms (site-selection) and LEDMs (business attraction), if not

nationally implemented or generalized, would only serve to send a negative signal to firms. Such negative signals may reduce the attractiveness that localities may have for firms. Besides, even if these proposals were implemented nationwide, companies still have high international mobility to their advantage to move to another country. For these reasons, to change the rules that govern the game does not seem to be a suitable option to overcome the W.C. in local economic development.

The Empirical Theory

The research approach: focus on the result rather than on the determining factors

A necessary (but not sufficient) condition for the W.C. to occur is that one bidder outbids all other bidders in the auction. This outbidding occurs due to flawed overestimation of the actual value of the auctioned asset. Auction scholars have tried to uncover, isolate, and measure the factors that lead bidders to overestimate the actual value of the auctioned asset. Accordingly, those scholars who have previously applied auction-like theory to other not strictly auction scenarios have followed suit, see, for example, Anandalingam and Lucas' (2004) book.

In economic development, the market structure, the interaction among the most important actor, as well as the rules that govern the use of economic incentives to lure businesses are embedded preconditions for the W.C. outcome. However, it seems complicated to measure and demonstrate causation taking the market structure, actors' interaction, and the rules of the game, as independent variables and overestimation as the dependent variable. More so, if we take into consideration the complex interplay among these three features of the use of incentives. Additionally, in the context of economic development, there is no explicit reference of the real true value of the auctioned object, and therefore it is challenging to have a ceiling from which it

can be said that overpayment has taken place. Consequently, it seems almost impossible to isolate, and to measure the effect of each explanatory variable, and to demonstrate causation over the W.C. outcome.

While the mechanisms and the functioning of the causal relationship between overestimation and its explanatory variables seem impossible to operationalize and, therefore, to measure, it is still possible and desirable to analyze the W.C. outcome. We might not convincingly uncover and measure its determining factors, but we can determine whether a result is, or is not a W.C. outcome. To reach to such conclusion is possible by using Thaler's W.C. versions 1 and 2, which respectively state that an outcome is a W.C. if the winning bid exceeds the value of the item, so the bidder loses money, or if the value of the item is less than the bidder's estimate, so the winning bidder is disappointed.

This research strategy of focusing on the result rather than on its determining factors can potentially allow to test the winner's curse hypothesis in an auction-like scenario. For example, Wladimir (2014) proposes that in an auction-like scenario concerning a public investment "the most convincing proof of the winner's curse would be to check that a significant negative difference is observed between ex-ante and ex-post net social outcome [like] in comparing the results of ex-ante and ex-post cost-benefit analyses of the same event." Wladimir (2014) continues elaborating further this point as it follows "[u]nexpectedly higher net social cost or lower net social benefit would confirm the winner's curse hypothesis. [In other words,] if the ex-post net social cost is significantly higher than ex-ante net social cost or if the ex-post net social benefit is significantly lower than ex-ante net social benefit." However, it is quite rare to find LEDMs that perform ex-ante and ex-post analysis of incentive packages. Furthermore, from a researcher's point of view, even if we find cases in which ex-ante and ex-post evaluation

assessments were performed, it would be difficult, if not impossible, to investigate if their final offer was equal or less than their expected benefits calculated.

This approach implies comparing the estimated value of the auctioned object with the true value of the object after winning the auction. However, as stated before, even if LEDMs had an estimated value (some sort of technical analysis such as cost-benefit, or economic impact analysis), it would be infrequent for them to make follow up (ex-post) analysis of this sort once the deal was closed and its operative stage has begun. For this reason, a thorough analysis that reveals the true value of the won object most likely does not exist. Such lack of information and analysis poses a noticeable challenge for those wanting to know whether grating the DEI package was or not a W.C. outcome by comparing the results of an ex-ante and an ex-post analysis in terms of a net social outcome.

This lack of ex-ante and ex-post assessment, which constitutes a methodological hurdle for the evaluation of the net social outcome, can, however, be overcome since there is a way to investigate if a given incentive package was or not a W.C. outcome. This possibility can be executed by looking at the financial or budgetary long-term consequences of granting a DEI package. In economic development, both a higher net social cost than expected or a lower net social benefit than expected, have clear and measurable long-term fiscal consequences. Thus, a negative net social outcome will be equivalent to Thaler's W.C. version 1, while a modestly positive net social outcome will be the equivalent to Thaler's W.C. version 2.

Fiscal impact analysis usefulness

While it is challenging to know the value of the expected returns of the incentive with which LEDMs entered the auction (ex-ante evaluation), we can know and analyze its long-term

consequences by using the tool of fiscal impact analysis (FIA from now on) of incentives. Let us assuming first that FIA can be used as an ex-post or post-award evaluation assessment. According to Morgan (2010), fiscal impact analysis is "[t]he most comprehensive way to determine how a development project will affect a local government."

Hurwitz (2015), asserts that "[f]iscal impact analysis is used to calculate the changes in costs and revenues to a government budget because of a financial incentive. Specifically, FIA is a 'projection of the direct, current and public costs and revenues associated with residential or non-residential growth to the local jurisdiction(s) in which the growth is taking place.'" Morgan (2010) also adds that FIA "considers the costs of development in relation to the public sector benefits such as new revenues from taxes, fees, and user charges. By addressing both the costs and benefits to local government, a fiscal impact analysis makes it possible to determine a project's net fiscal effect on a jurisdiction." Lastly, Hurwitz (2015) affirm that "[b]ecause incentives investments are usually made by abating, exempting or crediting publicly collected taxes, FIA is the closest public-sector analog to the private-sector [return on investment analysis]."

Thus, FIA can measure the total fiscal effect of an incentive package, which can be defined as the positive or negative result from subtracting indirect fiscal effects from direct fiscal effects. The direct fiscal effect can be defined as the positive or negative result from subtracting direct revenue losses from direct revenue gains. Indirect fiscal effects, on the other hand, are defined as the positive or negative result from subtracting indirect revenue losses from indirect revenue gains. Fisher (2007), argues that indirect fiscal effects are most likely to be negative[6] in most cases involved in the use of DEI packages. Consequently, to have a positive total fiscal

[6] A point elaborated later

effect, in the long run, the direct revenue gains must outweigh not only the direct revenue losses but also the negative indirect fiscal effects. If such conditions do not hold, then we will have a fiscal deficit. If we do not have a fiscal surplus, but a fiscal deficit, then we will have a W.C. upshot.

Using letters (as mathematical symbols) along with basic math symbols, we have that:

$$(A)\ Total\ Fiscal\ Effects = (B) Direct\ Fiscal\ Effects - (C) Indirect\ Fiscal\ Effects; equation\ (1)$$

$$Where: B = (B') Direct\ Revenues\ Gains - (B'') Direct\ Revenue\ Losses;\ equation\ (2)$$

$$Substituting\ equation\ (2)\ in\ (1)\ we\ have\ that\ A = B' - B'' - C;\ equation\ (3)$$

Given equation 3, A can be either positive or negative according to the following logic: B must be greater than C to have a positive fiscal effect in the long-run or a fiscal surplus. However, this can only be possible if B' is greater than B'' to the extent that the result also outweighs C. Then, if B' – B'' > C we will have a fiscal surplus resulting in a positive A. On the contrary if B' < B'' then we have that B' – B'' < C, and therefore, we will have Thaler's W.C. version one or a fiscal deficit. We would have the same result if B' is slightly greater than B'' with a result no greater than C. This would also yield a W.C. result expressed in a negative A. Accordingly, in this dissertation Thaler's W.C. version one will be defined as a situation in which B' < B'' and therefore B' – B'' < C or as a situation in which B' $\gtrapprox$ B'' but B' $\gtrapprox$ B'' < C, in both cases A will be negative denoting thus a fiscal deficit.

Components of the fiscal impact analysis

Next, it is necessary to do a thorough explanation of what encompasses each of the components of equation 3 (the total fiscal effect equation). Moreover, as it will be shown later in

this chapter, those scholars who have worked (directly or indirectly and theoretically or empirically) with the fiscal consequences of incentive packages have also included "governmental debt" in their analysis. For this reason, although debt does not appear in the total fiscal effect equation, an explanation of what debt encompasses will also be included next.

(B') direct revenue gains. To measure direct revenue gains (generated by having granted economic incentives) is necessary to understand how local public finances are (supposedly) boosted years after companies were successfully lured into the locality. To this end, and according to Paulsen (2009), it is necessary to analyze changes over time of 1) revenue sources, 2) tax base composition, and 3) tax rate. For this reason, next, it follows a description of each category and an explanation of how an incentive package can provoke changes in each category.

1) Revenue Sources.

Johnson and Roswick (1991) define the fiscal capacity of a governmental jurisdiction as "the ability to generate taxes and other revenue." Thus, for these authors, the "[f]iscal capacity stems directly from the community's tax and revenue base," being the revenue base all "forms of economic activity that constitute the real or potential objects of taxation or charges." Hence, revenue sources can be divided into own-sources and outside-source. According to Otto and Swenson (2006), "own-sources revenue is composed of three major categories: (1) tax revenue (including property, sales, income, and miscellaneous), (2) current charges (including user fees, admissions, and charges), and (3) miscellaneous general revenue (including interest earnings, special assessments, sale property, and others)."

Harpel (2016), asserts that "[e]stimating new taxes likely to be generated by a project [in this case the new company enticed] requires a strong understanding of the tax structure and

several assumptions about who will pay what and when." For example, if the incentives bring a new company that, in turn, will bring new people to the community, projections of the probable sum of taxes to be generated per capita or per household can be made based on past revenue data. Furthermore, new businesses lured by the incentive package will also pay taxes, except for those abated as part of the incentive package. In this case, projections of taxes can be made from the information provided by the business concerning assets and operations.

Moreover, Bise (2010) asserts that "[t]he key determinant in the calculation of the net fiscal results generated by new development is the local revenue structure." He continues explaining that "[e]very community relies on at least one predominant revenue source, and some communities rely on several." He also elucidates that "[a]n important component of the revenue structure is the formulas that are used for the distribution and collection of various taxes," which differ significantly from state to the other for most revenues except for the property tax.

On the other hand, outside-source revenues include grants and aids from state and federal governments. Forecasts of the expected impact of an incentive package on outside-source revenue require an understanding of the formula used by the state to distribute educational and other local government aid. According to Paulsen (2009), this is not an easy task "[b]ecause many states use complex equalization formulas which rely on formulas of the market and assessed value, significant land development which alters aggregate property value within a municipality may have substantial effects on equalization aids." For example, Paulsen (2009) continues explaining that "while a large non-residential development may appear to add to the tax base of a community without an increase in school children, this change in the tax base per student may cause the school districts' equalization aid from the state to decline**.**"

2) Tax Base Composition.

Berne and Schramm (1986) explain that tax bases for all levels of governments include various forms of wealth, income and consumption, and transfers with variation across governments in what is included and measured in each base. Accordingly, the analysis of the changes in the revenue sources is inextricably related to the analysis of the change in the tax base composition. It can be considered the two sides of the same coin. Johnson and Roswick (1991) assert that "[i]n some ways, the various tax and revenue bases are overlapping and duplicative." These authors continue explaining that "[t]he ability to pay a property tax, an income tax, a sale tax, and/or a user charge stem from the same asset base and income streams." For these authors, the property-tax base, the sale-tax and excise-tax base, the income-tax base, and the user-charge-and-fee base encompass the main categories of a community's tax and revenue base.

3) Tax Rate.

Berne and Schramm (1986), explain that the "tax rate may be fixed (like 5 percent sales tax rate) or may vary according to a formula linking the rate to changes in the base's level or some other characteristic (like an income tax with higher rates for higher income levels, or different rates for a different type of business)." Additionally, Hildreth (1997) illustrates that "[t]he rates of taxation can be fixed over time or varied depending upon yearly budget decisions. Tax rates are set in the budgeting process in those jurisdictions where the property tax is the budget-balancing mechanism." He continues explaining that "[i]n other municipalities, every property tax levy requires specific voter authorization, and in such cases, the rate does not change to meet yearly budget needs." This author concludes, stating that "[m]ost local sale and

income tax rate also do not vary unless new rates gain authorization from the state legislature and/or the voters."

Berne and Schramm (1986) assert that "[t]axation methods consist of the application of a tax rate to some measurable tax base with the product of the two yielding the tax revenue from that particular method and source." Among the locality's own-sources revenue, the property tax remains the most critical source of local tax revenues due to the fact the real property is the least mobile of tax bases, which makes it especially appropriate for the local level (Raphaelson 1996). Raphaelson (1996) continues explaining that property tax is a tax on certain types of personal or business wealth held in the form of real or personal property. For this reason, Paulsen (2009) asserts that "for cities with heavy reliance on the property tax, the percent of the tax base in residential and non-residential development is a key variable of interest."

In other words, the impact of the new property value on the tax levy and tax rates goes to the property tax and its corresponding rate. Paulsen (2013) explains this as follows.

> Property development or land-use change alters the property tax base because new property value is added to the tax rolls. If the property tax levy (the amount raised by property taxes [which is equal to] property tax base multiplied by tax rate) is fixed, increased property values will lead to decreased property tax rates. Likewise, if property tax rates remain fixed, increases in property values would lead to increases in the tax levy.

According to Paulsen (2009), this is particularly important in cities with substantial dependence on the property tax because "the percent of the tax base in non-residential development represents the 'tax price' of an additional dollar in local property tax revenues to residents." That is, "in communities where revenues accrue through the property tax system,

higher percentages of the property tax base in non-residential development reduces the net tax price to residents of public services" (Paulsen 2009).

The preceding discussion illustrates how an incentive package is expected to spur revenues gains. The anticipated outcome, if the incentive package served its purpose as expected by its supporters, is that in the long run, there will be revenue gains for the public coffers, that will be an enlargement of the local tax base, or fewer taxes levied to the people living in the community. However, the dynamic of the influence of economics incentive packages over public revenues is more complex to understand and to observe, as exemplified by the property tax.

For example, to lure a business means that new property value is added to the tax rolls, which is translated into an increase in the property tax base. This increment in the property tax base provokes either a decrease in the property tax rate or an increase in the tax levy. The results depend on whether the property tax levy or the property tax rate remains fixed, which in turn is determined by the state laws governing property tax administration and tax/expenditure limitations. Simultaneously, new property value added to the tax rolls (due to having successfully lured businesses) means a higher percentage of the property tax base in non-residential development, which reduces the net tax price to residents.

(B") direct revenue losses. This element of the fiscal equation refers to changes in expenditures through alterations of the demand for public services and the production of local public services. For example, a new business locating in a community may build a new facility that will require services and new capital infrastructures, such as new roads and sewers. This location of the new facility within the community can substantially alter local servicing costs.

Additionally, new residents attracted to the community as employees of the new business will also require services and infrastructure. The new commuter, as well as the new resident composition of the workforce, must be known because each one will alter the direct revenue losses differently. New commuters, for example, will increase car-trips on the roads network, provoking an increment in the cost of road maintenance, while new residents will increase the number of children enrolled in the local schools, houses built, an libraries and park facilities needed.

Almost all development projects will place an additional burden on existing demand and production of public services and infrastructure, creating thus both upfront and ongoing expenditures. Mucha (2007) elaborates this point by using the following example: if the development project also brings the need for the construction of a new school, the locality will be incurring in a one-time capital cost (upfront expenditure) for the school building and equipment. Moreover, the locality will also incur operating costs (ongoing expenditures) for teachers, staff, utilities, and other operating and administrative costs necessary to operate the new school, all of which would have been unnecessary had the development project not occurred.

In the case of the use of economic incentives, Fisher (2007) argues that one of the most common outcomes of attracting business is an increase in labor force participation in the form of induced immigration. These new people will require an additional level of services. Using the U.S. Census of Government Finances for the 2009 fiscal year, Paulsen (2013) shows that among the local government expenditure to provide public services and responsibilities the most significant allocation was on education, followed by social services, public safety, and environmental services (parks, natural resources, water, sewerage). In short, all expenditures

expected to be incurred by the locality that can be tied directly to the new development must be counted as a direct revenue loss.

It is also imperative to include the cost of the incentive package in the direct revenue losses of the FIA. However, According to Harpel (2016), this is a very challenging task because the total value of the incentives over time and the time value of money complicates the calculation. Harpel (2016) also adds that "[a]nticipating the timing of disbursements for different elements of the incentives package can also be complex, especially when in-kind, cash and tax-based incentives are combined." This author also elucidates that, very often incentive package involves overlapping governmental jurisdiction and to disentangle its jurisdictional layers may not be an easy task at all. According to Harpel (2016), a final reason that complicates calculations is that tax-credits poses problems due to the unknown numbers of eligible companies as well as when companies will use these credits once awarded. This difficulty, however, should not be a problem in calculating the revenue losses of the discretionary incentive package.

The literature on FIA can be summarized primarily as the literature on the expected costs and benefits for the government due to proposed development projects. On the benefits side, the literature emphasizes that a complete analysis must not only be focused on the expected taxes to be generated but also on the changes in the tax base as well as the tax-rates. Nevertheless, there are no many references on how to perform this analysis step by step. Likewise, there are not many references for techniques or methodologies to carry on the study of the change in the revenue structure. At most, the literature provides a guideline or steps to project or forecast revenues, which is just one part of the analysis. However, the literature makes references to

different fiscal impact models and software developed by consultant companies, universities, and government.

Hence, the literature on FIA emphasizes techniques and methodologies to perform an analysis of the costs incurred by the government due to development projects. Juntunen, Knaap, and Moore (2011) assert that usually, FIA is used to analyze three possibilities: 1) changes in the use of land, 2) changes in local development patterns, and 3) changes in national, state, or regional patters. Let us call to number 2 and 3 changes in local and bigger units of analysis due to development. According to the literature (see, for example, Erickcek 2005; Harris and Berkebile 2008; Lamie, Campbell, and Molnar 2012; and Mucha 2007), there are two methods widely used to forecast expected cost for government in the case of local and bigger places. Those methods are known as Average Cost Methodologies and Marginal Cost Methodologies. In turn, each one has a subset of methodologies such as Per Capita Multiplier, Proportional Valuation, and Service Standard (for the average methodologies), and Case Study, Comparable City, and Employment anticipation (for the marginal methodologies).

Likewise, according to the literature (see, for example, Bise 2010; Juntunen, Knaap, and Moore 2011; Kotval, Mullin, and Lempke 2006; and Morgan 2010), to analyze changes in the use of land, there is one technique known as Cost of Community Services (COCS) studies. Depending upon many factors, such as the purpose of the analysis, time, and resources constraints is possible to combine average costs, marginal costs, and COCS methodologies to analyze government expenditure. The fact that the FIA literature is full of possibilities to analyze costs side tell us how important, complex, and challenge is to make these calculations accurately. Embedded in those methodologies are two concepts of vital importance, Level of Services (LOS) and Capacity of Existing Infrastructure (CEI).

According to Ladd (1994), local public expenditure is defined as the product of a service level per resident, the unit cost per resident of providing services, and a measure of the division of service responsibilities between state and local government. What this tells us, is that service level per resident, and the unit cost per resident are two different things deeply interrelated. Thus, Paulsen (2013) urges us to be aware of the critical distinction between costs and expenditure. Unlike Ladd (1994), Paulsen (2013) takes out of the equation the measure of the division of service responsibilities between state and local government and defines local public expenditure as the number of units of service provided multiplied by the cost of the cost-per-service unit.

In an economic sense, Ladd (1994) defines the LOS as "the goods and services that citizen voters value," while Paulsen (2013) defines it as the reflection of residents' demand for services. In a more technical sense, Bise (2010) defines LOS as "facility or service standard that has been planned for or that is currently being funded through the budget." According to Bise (2010), there are several reasons why it is essential to know the existing LOS. For example, knowing existing LOS "provides a baseline for reviewing community level-of-services goals in light of fiscal constraint. Once the current level of services is determined for each activity, the cost of new deployment can be evaluated easily."

Additionally, Bise (2010) also illustrates that FIA can also help to determine realistic LOS needed to accommodate new deployment. Moreover, LOS can also be used to analyze the impact of "shadow citizens" (those community outsiders who use community services but do not contribute with taxes for their payment). Finally, LOS can also be used to estimate the fiscal consequences of upgrading them. For instance, some communities may want unachievable LOS (due to their inability to raise revenues), while others may experience pressure for higher LOS (due to unexpected population growth in the form of migration).

Wrapping up, costs sides of FIA refers to governmental expenditure projections. Local public expenditure is equal to LOS times costs. Therefore, expected changes in local expenditure are due to forecasted changes either in costs or LOS or both. Thus, higher expected expenditure may be due to more LOS needed or higher costs incurred due to the proposed development project. While higher costs might be an indirect consequence of the project, a need for more LOS can be a direct consequence of the project (due to population growth, for instance). Nevertheless, population growth does not necessarily translate into more LOS needed if the existing infrastructure can accommodate growth. That is, even is the project means population growth (in the form of induced immigrants), this does not necessarily mean an increment in public expenditure (or revenue losses).

The need for coping with growth led us to another vital concept necessary for a comprehensive grasping of the analysis of local public expenditure, the Capacity of Existing Infrastructure (CEI). Bise (2010), states that any change in land use, population, or employment (induced by new development) will have an impact on several or few capital-investment services required in a community, which might or might not require new investment in infrastructure. Thus, to forecast infrastructure needs to meet anticipated changes in a community is an essential element of a right FIA, according to Bise (2010). Critical concepts in analyzing infrastructure characteristics on FIA are “unused capacity” or “excess capacity” and “tipping points.”

For example, if a community has functional excess capacity in existing facilities, this means that the community can absorb growth without the need for incurring additional capital costs (Bise 2010). On the contrary, if a community is at a tipping point, this means that “one more typically modest unit of increase in population requires to outstrips the existing capacity of an infrastructure item, requiring a relatively large capital investment” (Lamie, Campbell, and

Molnar 2012). There is another possibility, which is when a community is at a tipping point and yet absorbs growth without making additional infrastructure investment. In this latter case, the community will continue functioning. However, the tradeoff will be a deterioration of the quality of services provided by local government, such as traffic congestions on roads, schools overcrowded, and periodic breakdowns in water supply and other public services provide.

The first step in assessing the capacity of existing infrastructure to absorb growth is to have full knowledge of existing LOS. The logical next step is to determine the required extra LOS to be provided in order to keep fixed the quality of public service after having absorbed growth. Bise (2010) explains that this "analysis will indicate how much new infrastructure will be required to serve an anticipated level of new development. Costs can then be projected for land, equipment, improvements, and operating expenses for maintaining the new infrastructure." While specifying current LOS that serves the community before absorbing growth is a matter of having a good inventory of public services provision, to determine how much extra LOS will be needed (given a new development project) is a matter of accurately forecasting population growth as well as having a clear definition of what "capacity" means. This, because capacity is a term that can have both quantitative and qualitative meaning. How can a local official know if in his or her community there is excess capacity of public safety (police and fire) but a tipping point in water and sewer?

To answer this question, Bise (2010) and Paulsen (2013), illustrate that desired standards for communities' LOS can easily be known for many major public services categories since published national standards for guidance on LOS capacity are produced by national professional-technical organizations or federal regulatory institutions. This sort of data is the raw material to build what Ammons (2012) calls "municipal benchmarks," which in turn can be used

to gauge the quality of public services provided by local governments. It is possible to determine if the quality of public services has been kept the same, improved, or deteriorated when compared to those professional standards and the benchmarking built through them.

In conclusion, the analysis of revenue losses in FIA is the projection of expected public expenditure induced by a new development project. Public expenditure is equal to LOS multiplied by its costs. As it will be argued next, one of the expected (although indirect) outcomes of using economic incentives to lure business is an influx of immigrants into the community. Therefore, increased LOS will be needed to maintain the same level of public service provision. How much increment of LOS will be required is a matter of judgment and guesstimates, which can be improved by using standard made and published by professional-technical organizations or federal regulatory institutions. In turn, these standards can be used to build municipal benchmarks to gauge the community's welfare implications of having incurred in revenue losses using economic incentives.

(C) indirect fiscal effects. Mucha (2007) illustrates that indirect revenue gains and losses are "additional expenses and revenues generated as a result of the new development, but not directed traceable to the new development." Mucha (2007) also explains that indirect impacts are much more difficult to predict as the task implies to "link explanatory variables such as population, income, property values, number of jobs, etc., with a response variable, such as demand for services or a jurisdiction's cost and revenues." Paulsen (2013), asserts that two common indirect fiscal effects must be taken into consideration in FIA, which are the "likely indirect effects of changes in the local real estate market and the 'multiplier' effects of changes in local employment or population."

Regarding the first most likely indirect effect, change in property value of other properties because of a land development project, Paulsen (2009; 2013) illuminates that it is crucial to mention that these effects may be ambiguous for the two most broadly used categories of land development projects (residential and nonresidential). That is, a residential land development project can positively or negatively affect the value of other properties within the locality, and the same can be said for nonresidential land development projects, which means an increase or decrease of property tax revenue. Additionally, Paulsen (2013) points out that by taking into consideration indirect effects, it is possible to correct the "attribution problem." That is to make a comprehensive account of expenditures in local government budgets for the land development project regardless of its type. For example, a nonresidential land development project indirectly does place a burden on the local educational expenditures, which would not be counted as a direct revenue loss.

In other words, Paulsen (2013) elucidates that nonresidential land development projects may have indirect fiscal effects that a residential land development project would have as its direct fiscal effects. Conversely, residential land development projects will have indirect fiscal effects that a nonresidential land development project would have as its direct fiscal effects. For example, when luring a big firm into the locality (a nonresidential land development) using incentives, the opening of this new plant will attract new workers in the community, some of which will eventually become residents of the city demanding to have new houses to be bought. The need for new houses will induce the creation of a residential land development that will have its direct fiscal effects that must also be counted as indirect fiscal effects of having lured the firm that brought new residents to the community.

Moreover, Paulsen (2009) illustrates that both types of land development projects will generate a change in the revenue and expenditure structure of the local government finances due to the rippled effect through the rest of the economy. For example:

> As new employees [nonresidential land development project] spend some of their new income at businesses within the city, this would increase sales tax collections from local businesses. New employees' spending will generate additional jobs, from schoolteachers to donut makers to janitorial services. These additional jobs will also generate wage taxes and sales taxes and, probably, additional service demands. . . . Likewise, new residents of a community [residential land development project] may spend their money at local donut shops and motorcycle repair garages and beauty salons. This additional economic activity similarly generates additional revenues and expenditures.

To complicate the matter even further, Paulsen (2013) concludes, stating that "[t]here is no a priori way to know whether the magnitude or direction of indirect effects would overwhelm the direct effects predicted in fiscal impact analyses. If indirect effects are significant enough, their exclusion from fiscal impact analyses could potentially influence local land use decision making toward potentially incorrect conclusions and policies."

Harpel (2016), however, asserts that one way to estimate the multiplier effects as the indirect fiscal effects of FIA is by incorporating elements of Economic Impact Analysis (EIA) into the calculation. Thus, EIA calculates indirect and induced effects that track "the flow of money between industries and households until all of the initial investment eventually leaves a region through foreign or domestic trade or is collected as a tax." This approach would require to also perform an EIA along with FIA. Nevertheless, Harpel (2016) warns that this approach "should be used cautiously, as it requires assumptions built on assumptions that may exaggerate the actual likely budgetary flows associated with the project at hand."

Up to here is crystal clear that to calculate indirect fiscal effects is very troublesome, yet not to include them carries the risk of coloring the analysis, and what is even worse, the risk of misleading LEDMs to make a wrong decision regarding the use of economic incentives. Years later, this wrong decision -if not in the short run- can negatively affect local governmental finances. Hence, change in the land value of other properties or land, as well as the multiplier effects into the local economy, must be taken into consideration for a comprehensive FIA. Focusing exclusively on the use of incentive regarding the change in the value of other properties or land, Fisher (2007) asserts that "a typical package of state and local grants, loans, tax credits, and tax abatements granted to a manufacturing firm . . . consisted of about equal portions of state subsidies and local subsidies."

Therefore, Fisher (2007) continues arguing that "local property values may reflect most or all of the benefits of a plant location but will not reflect about half of the costs . . . since state costs will not be capitalized at all into local property values." Finally, Fischer (2007) concludes, saying that "[t]he long-run effect on property values may be lessened as the local housing market responds to the initial increase in demand brought about by the expansion of job opportunities." For this reason, Fisher (2007) disregards the change in property value as a good measure of the long-run indirect fiscal effect of using an incentive package. Notwithstanding, Fisher (2007) argues that indirect fiscal effects can be measured as the net fiscal effects of growth in a) the labor force, or change in the local unemployment rate, b) demand for additional services, c) additional taxes produces by in-migrants or newly employed residents as well as d) rising labor cost due to upward pressure on wage and land prices.

In other words, according to Fisher (2007), granting an incentive package expecting to bring or create new jobs have four effects because of the population growth induced directly by

the incentive. These effects are 1) lowering the unemployment rate, 2) increasing the labor force participation rate, 3) induced immigration, and 4) displaced existing jobs. In this regard, Fisher's literature review indicates that usually, in-migrants represent a fiscal drain. For example, for every 100 new jobs created by opening a new plant or expanding an existing plant, about seven jobs will be filled by unemployed residents. The other 16 jobs will be filled by residents who otherwise would be out of the labor force, and the remaining 77 jobs will be filled by in-migrant.

Therefore, Fisher (2007) asserts that the indirect fiscal effect of granting an incentive package is negative since most of the jobs will be in the long run filled by in-migrants in most cases. This because while the 23 jobs filled by existing residents should produce a fiscal surplus by paying more taxes but consuming the same (or perhaps less) in services, this surplus will probably not be enough to offset losses from the other 77 jobs occupied by in-migrants. That is, residential growth does not pay its way due to the increase in the cost of city services. For this reason, "C" (indirect fiscal effect) is assumed to be negative in our mathematical representation.

Local government debt. As part of the direct revenue losses incurred by the local government are current and capital expenditures, this last one is spending on fixed assets (capital improvement) that will deliver services in several years. Leonard (1996) assert that capital improvement projects can be funded by pay-as-you-go financing or pay-as-you-use financing. According to Driessen (2018), local officials are prone to use pay-as-you-use financing mechanisms because taxpayers are reluctant to pay today for services to be received in the future. This pay-as-you-use financing tool is municipal debt.

Thus, by issuing municipal debt to fund capital improvement, local governments pursue several economic development goals—for example, Seidman (2004) mentions three goals to achieve by issuing municipal debt. First, to raise capital for development finance programs,

second, to finance infrastructure projects that are critical to supporting economic activity and local quality of life, and third to supply capital at below-market interest rates to support the growth of small manufacturing firms.

Driessen (2018) asserts that "[s]ince public capital facilities provide services over a long period; it makes financial and economic sense to pay for the facilities over a similarly long period." Hence, long-term debt tools are "bonds" with a maturity longer than a year. The maturity is the date at which the issuer is obligated to repay the principal (amount of money borrowed) of a bond. However, bonds may also be used for cash management purposes when revenue collections do not match spending needs during the fiscal year. These short-term debt tools are known as "notes" with a maturity of 12 months or less.

Bonds are then, by definition, long-term municipal debt that carries a below-market interest rate in exchange for its federal tax exception. Consequently, bonds are also known as tax-exempt municipal debt or tax-exempt bonds. This municipal finance tool can be classified by the type of its security, which refers to the revenue source pledge to repay the bond. Accordingly, bonds can be of general obligations (GOB) or revenue bonds. GOB are backed by the full faith and credit pledge from the issuing government entity. That is, the government makes an unconditional pledge to use its powers of taxation to honor its liability for interest and principal repayment. Conversely, revenues bonds are backed by the pledge of specific and limited revenue sources. That is, only the revenue from a specific tax or the earnings from the project financed with the bonds.

Worthy of notice among revenue bonds are industrial development bonds (IDBs), tax increment financing bonds (TIFs), and moral obligation bonds. According to Leonard (1996), IDBs are "[s]old to finance constructions of commercial facilities (e.g., manufacturing plants,

shopping malls); the bonds are secured by payments from businesses that use the facilities." Seidman (2004) asserts that IDBs "are used to finance capital expenditure of manufacturing plants such as land acquisition, construction of a new plant, expansion of an existing one, leasehold improvements, and equipment used in a plant to mention a few."

TIFs, on the other hand, are, according to Weber (2012), "a reallocation of property tax revenue from the municipality's general fund to a smaller enclave of contiguous properties: a TIF district." Seidman (2004) asserts that "TIF often finances infrastructure improvements in a deteriorated or blighted area that are critical to attracting new investment, development, and business activity." Seidman (2004) also illustrates that there are three ways to finance infrastructure with TIFs, one of which is "to borrow funds, usually through a municipal note or bond sale, to make a large up-front investment." Finally, Schoettle (2003) explains that moral obligation bonds are a "form of revenue bonds where the issuer does not specifically pledge taxes for their repayment but promises that consideration will be given to using tax revenue to cure deficiencies in the principal or interest accounts."

The reason why local or municipal debt is essential in the analysis of the long-term fiscal consequences of using discretionary economic incentives is that previous debt burden may reduce the ability for additional infrastructure to service new land development. Paulsen (2009) explains that if "a municipality is already at a high debt level; it may be unwilling or unable to finance new or improve existing capital facilities. In such a situation, new land development may lead to congestion of existing capital services." Correspondingly, "new facilities required to service new land development may come at increased borrowing cost [debt increment]," (Paulsen 2009). Additionally, Patrick (2014) asserts that "[t]he debt service obligation for economic development incentives funded through general obligation bonds can

also represent a substantial liability for state and local governments." For this reason, it is crucial to analyze the trend and pattern of debt once incentives were granted.

From fiscal impact analysis to W.C. in local economic development

As shown above, the proposed conceptual definition of W.C. regarding the use of economic incentives to attract businesses to foster local economic development comes from the FIA framework. This, however, assuming that FIA can be used in a post-award evaluation. Relaxing this assumption lead us to another methodological challenge since it is not feasible to measure W.C. using a standard FIA framework and data. FIA was developed and has been used ever since then, as a forecasting tool on how a new development project will, among other things, affect public finances. That is, FIA has never been used to gauge how an undertaken project has affected public finances years after been implemented. For this reason, the W.C. concept must be operationalized by using data not stemmed from FIA software or methodology. To this end, it is necessary to illustrate through a conceptual map the consequences of using incentives to lure or retain business.

Such a conceptual map (figure 1) was introduced by Patrick (2014) and was named "The Concept of Economic Development Incentives." Patrick (2014) creates this conceptual map after she discussed conclusive findings in her literature review about the effects of incentives over the economy. The usefulness of this conceptual map is that it shows both possibilities of a fiscal surplus and a fiscal deficit. In another article, when citing her conceptual map, Patrick (2016) talks about the possibility of a "virtuous cycle of economic development." This virtuous cycle (figure 2) has embedded in it a cycle of fiscal surplus. We will call the opposite scenario the

"harmful cycle of economic development" (figure 3), which also has embedded in it a cycle of fiscal deficit or W.C. This conceptual map is shown below:

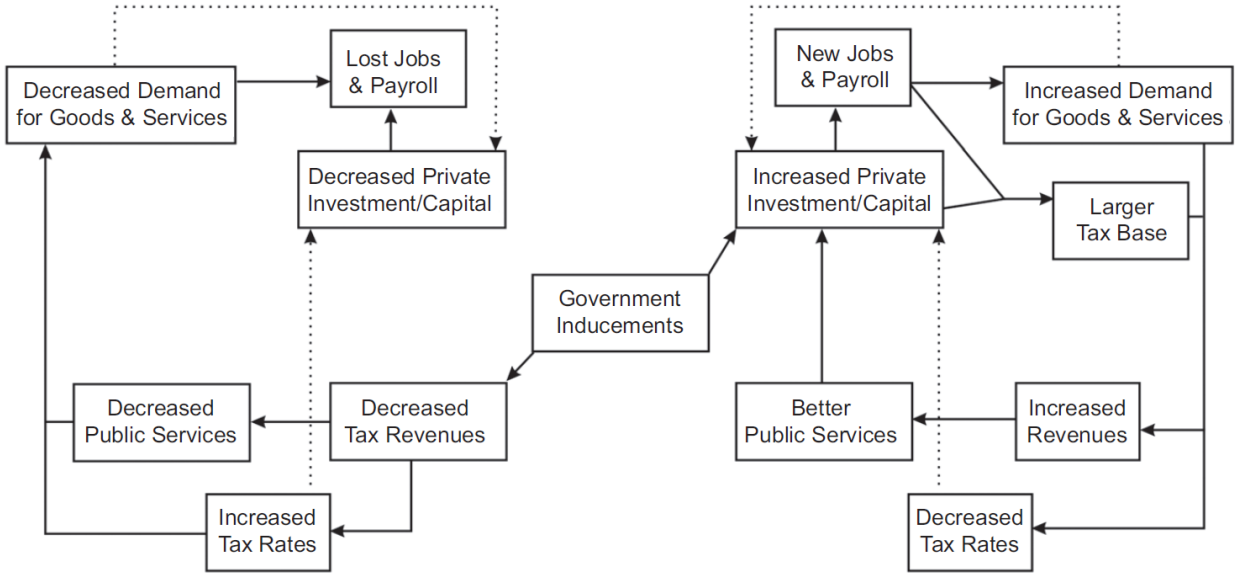

Figure 2.1. The concept of economic development incentives. *Source:* Figure from Patrick 2014, figure 1

As can be seen in figure 1, government inducement (the economic incentive package) is at the center of this conceptual map denoting thus that this is the catalyst variable that triggers either a virtuous or a harmful cycle of economic development. On the right side of figure 1, we have the virtuous cycle of economic development derived from having granted an economic incentive package. On the left side of figure 1, we have the harmful cycle of economic development derived from having granted an economic incentive package. Next to the theoretical causal mechanism explanation of both possibilities.

The virtuous cycle of economic development. In the words of Patrick (2016):

> "In order for the successful attraction of a large, new establishment to achieve economic development for winning counties, it must induce net new economic activity as well as fiscal surplus. Economic development incentives will have a positive fiscal effect if: (1) they increase economic activity (beyond that which would have occurred otherwise), and (2) the new activity adds more in tax revenues than the cost of the incentives and additional public services. . . . Lower taxes, better public services, or both result from the distribution of the fiscal surplus to taxpayers. Lower taxes and better public services also attract new economic activity, which brings the full cycle circle."

As can be seen in figure 2, for Patrick (2016) the virtuous cycle of economic development is comprised of a positive economic impact effect (new jobs and payrolls, and increased demands for good and services, as shown in the map below) plus a fiscal surplus (more extensive tax base, increased revenue, decreased tax rates and better public services). Patrick (2016) measures fiscal surplus by estimating the level, and per capita change in public revenues, select expenditures, and outstanding debt after a county had successfully attracted a new plant.

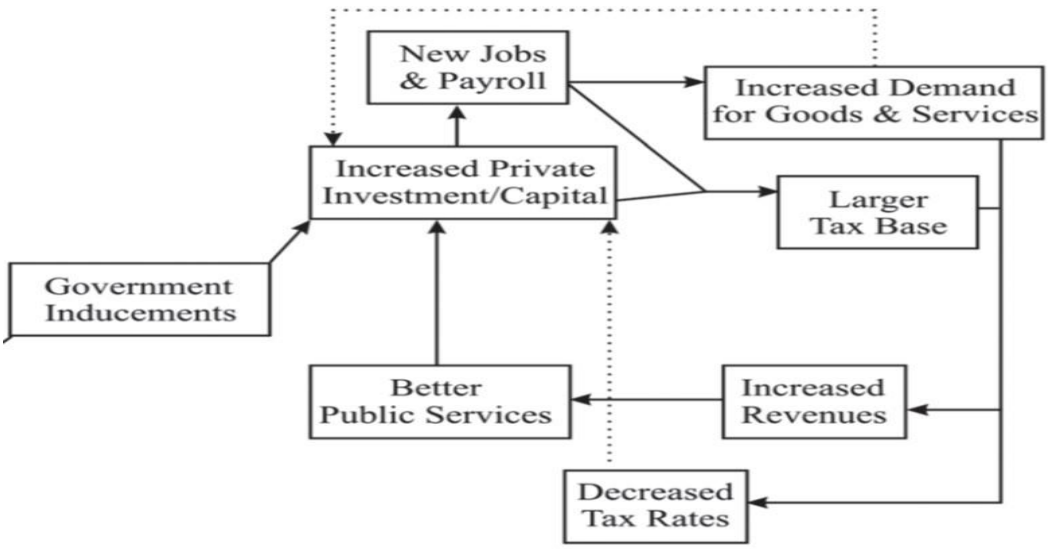

Figure 2.2. The virtuous cycle of economic development conceptual map. *Source:* Figure adapted from Patrick 2014, figure 1

The harmful cycle of economic development. In the words of Patrick (2016) "[c]ritics argue that incentives cost more government resources than they generate. Revenue shortfalls result in increased taxes or reduced public services. It has also been argued that the competition for capital results in public service reductions and that mobile capital implies that residents rather than firms bear tax increases."

As part of her literature review, Patrick (2016) found that the beginning of the harmful cycle of economic development is the fiscal deficit, which she rightfully calls a winners' curse scenario, and it end ups with a damaging negative economic impact effect. Her literature review revealed three points that explain this cycle. First, the local government must compensate for the revenue shortfall caused by the incentive either by reducing services or increasing taxes on existing residents and businesses. Second, this induces workers to locate elsewhere or demand higher wages, for which both the attracted establishment and existing businesses may be negatively affected. Third, establishments may also suffer from cuts in public services on which they rely. The harmful cycle of economic development is depicted in figure 3, and it shows the same variables as before but in reverse and negative flow.

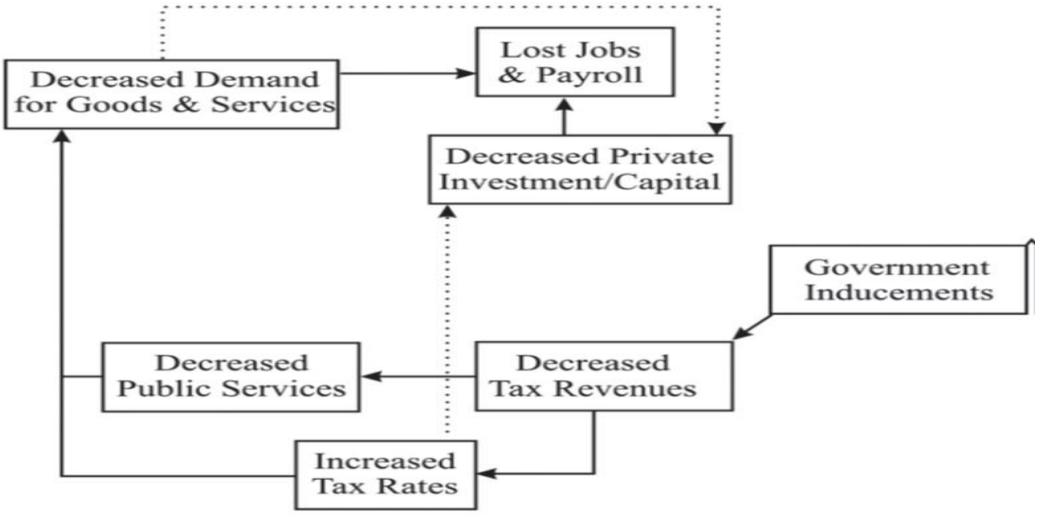

Figure 2.3. The harmful cycle of economic development conceptual map. *Source:* Figure adapted from Patrick 2014, figure 1

The work of Patrick (2014; 2016) coincides with Hurwitz's (2015) assertion about the expected consequences of granting an incentive package "[a] positive output indicates that an incentive and the private investment it spurs will create net revenue, allowing service quality to be enhanced, reserves to be generated, or taxes to be reduced. A negative output indicates that because of a project, taxes will need to be raised, reserves used, or services cut." For this reason, as well as due to the insights shed by the literature review on the components of the total fiscal effects, the long-term consequences of granting incentive packages will be operationalized, and therefore measured, by analyzing changes and trends throughout the time of the local revenue and taxes stream as well as local public debt and local governments' solvency to provide LOS.

However, each fiscal component is, in turn, comprised of several other subcomponents according to this literate review. For this reason, each fiscal component will have to be treated as a fiscal dimension (a multidimensional variable). Moreover, it is pertinent to acknowledge here, that although the guiding theoretical framework until here has been the W.C., the literature

review revealed that W.C. is only one of two possible outcomes. Incentives can spurn either positive or negative outcomes (the W.C. outcome). For this reason, chapter three takes a more neutral approach in recognizing one or the other outcome in the cases that will be empirically analyzed.

With all elements gather until this point, it is possible to empirically test the existence of the W.C. in local economic development incentive policy or its counter outcome the possibility of fiscal surplus. To this end, it is developed a model that reshapes the way fiscal impact analysis has been used, concretely, to conduct a post-award evaluation assessment. This approach goes beyond the standard usage of a fiscal impact analysis software or methodology, and it aims at uncovering the relationship between economic development policy and the public finances' health with its corresponding welfare implication for people leaving in places where firms have been lured supposedly due to the incentive package granted.

As will be seen in the next chapter, such an ambitious approach is with no hurdles, most importantly to specify and construct the variables that will be used to test and measure the long-run total fiscal effects of having granted DEI packages. Hence next chapter exhaustively explains the methodology that will be applied, including data description and the research design that will guide the remaining of this dissertation.

Chapter 3

Research Design and Methodology

The Research Design

Research question and hypothesis

To answer how to measure the long-term total fiscal effects for localities using discretionary economic incentives to lure business, it is necessary first to clarify what sort of long-term fiscal consequences will be analyzed. As mentioned in the previous chapter, a W.C. outcome will be represented as a fiscal deficit, making DEI a failed economic development policy. A fiscal surplus, on the contrary, will indicate that using DEI is a successful economic development policy.

Accordingly, a fiscal surplus, a situation in which $B' - B'' > C$, can be said to exist if, after the long run of having granted the incentive package, localities exhibit a trend of public revenues increment, taxes reduction, a public debt decrement, and enhanced government solvency to provide LOS. Conversely, a fiscal deficit, a situation in which $B' - B'' < C$ or $B' \gtrapprox B'' < C$, can be said to exist if, after the long run of having granted the incentive package, localities exhibit a trend of public revenue decrement, taxes levy increment, a public debt increment, and a decrement in government solvency to provided LOS.

This definition of W.C. allows us to enunciate a working hypothesis as follows:

Localities granting discretionary economic incentives packages to lure businesses impact in the long run their revenues stream, taxes stream, debt structure, and solvency to provide LOS

to its residents. Thus, localities positively influenced by their incentives program must exhibit low total fiscal effect index scores and a downward index trend. On the contrary, localities negatively impacted by their incentives program must exhibit high total fiscal effect index scores and an upward index trend. This hypothesis states that localities incentives programs are the catalyst variable of the observed fiscal surplus or the fiscal deficit (the W.C. outcome).

This hypothesis illuminates that the measurement tool, the dependent variable, is the index. Also, since it has been documented that the real fiscal long-run consequences appear after roughly five to ten years of having granted the incentive package, then it is necessary to compare the evolution of each of the index's fiscal dimensions throughout time after having granted DEI packages. First, however, before further explaining the index, it is necessary to present a detailed description of the research design that will guide the investigation process.

Plan to conduct the research

According to Du Toit (2014), a "[r]esearch design can be defined as a logical plan to maximize the validity of research findings." That is a research strategy involving a way of engaging empirical reality that will allow answering a research question (Du Toit 2014). But how this logical plan of action to confront practical reality can be classified and, therefore, be differentiated from others? Du Toit and Mouton (2013) answer this question by building a typology of social research designs for planners clustered into ten prototypical designs. The evaluation research design most closely describes this research and is among their ten prototypical designs. This type of research design has, in turn, three different subtypes, among which is "outcome/impact evaluation research design" (also known as ex-post evaluation research design).

Recalling that this research is aiming at analyzing the long-term fiscal consequences (in terms of public revenues, taxes levy, public services, and public debt) of having granted incentive packages to lure firms into the locality, then this research falls into an outcome, impact evaluation research design type. Although these authors did not specify the blueprint (components, stages, and process of data collection and analysis) of each prototypical design, they used six considerations in their typology. Hence, according to Du Toit and Mouton (2013), an evaluation research design has an applied context and a practical aim, its purpose is evaluative, its methodological paradigm is pragmatic, uses mixed-method as its methodological approach, its source of data is hybrid, and its core logic is to asses. Next, an explanation of how this research follows Du Toit and Mouton's (2013) considerations.

The context and aim of the research. For whom and for what reason is this research being conducted? Applied research is driven by practical aims and is conducted in practice for purposes of offering practical solutions to concrete problems (Du Toit 2014). Furthermore, the more a study conforms to applied research, the more emphasis practically useful findings are likely to have, with a preference for a flexible design that can accommodate a combination of approaches (Du Toit 2014). Hence, this research is being conducted with the hope of contributing to the debate on whether to use economic incentives to lure business is a good or bad economic development policy. Practitioners are caught in-between of an unresolved academic debate along with the need of "keeping up with the jones" for their communities not being left behind if they choose to refrain from using this economic development policy in vogue, nationally disseminated, and widely used for virtually all localities in the nation. A concrete problem that badly needs a practical solution. Moreover, as it will be shown later, this research accommodates a combination of distinct approaches.

The purpose of the research. Evaluative research evaluates practice by diagnosing or clarifying problems, monitoring programs, and measuring outcomes and impacts (Du Toit 2014). The goal of this research is to perform a post-award assessment by measuring the impact of the long-term economic incentives over the local public finances. The ongoing debate revolves around two factors, first the ambiguity between the cost of the economic incentives packages and the benefits created by them; second, states and localities' heavy reliance on economic incentives packages to lure businesses to promote economic development. The only way to know if this economic development tool creates a positive return on investment is by regularly, rigorously, and comprehensively evaluate them. Nevertheless, many localities do not collect the data needed to make a return on investment evaluation type after an incentive package has been granted.

According to Reese and Sand (2012), performance evaluation of specific development projects and their community-wide impacts is very infrequent. For example, the 2009 International City/County Management Association (ICMA) economic development survey only asked two questions explicitly focused on outcomes. How many jobs and how many new businesses resulted from development efforts over the previous five years? Reese and Sand (2012) question the accuracy of the numbers and results obtained since only 54% of the responding communities reported that they measure the number of new jobs created, and just 24% said they keep data on the number of new businesses. Consequently, these authors conclude that using analytical methods to evaluate policy outcomes (in this case, the economic incentive to lure businesses) is minimal, ergo, the need for and the relevance of this study for Alabama's localities.

The methodological paradigm. This research design consideration refers to the philosophy of science that permeates various facets of a study, albeit indirectly or subtly (Du Toit 2014).

Pragmatism is a methodological paradigm emphasizing relevance; in other words, research ought to solve problems in the real world and improve the human condition (Du Toit 2014). Additionally, it accepts multiple social realities and is likely to employ any combination of design or a mixed-method design selected according to what would best solve a research problem (Du Toit 2014). As stated in the preceding paragraph, the prevailing lack of projects' community-wide impact assessment (including Alabama's localities) makes this research pertinent and relevant. Thus, this research will contribute to starting an evaluation process of actual outcomes of using incentives in Alabama's localities, which will help to determine if the goals of efficiency and effectiveness of this policy are being met.

The methodological approach. Regarding the methodological approach used by a pragmatic paradigm, Du Toit (2014) asserts that this methodological paradigm tends to use a mixed-methods research design. Du Toit (2014) uses John W. Creswell's (a renowned methodologist specializing in mixed methods) simple but pedagogical and encompassing definition of mixed methods. Thus, for Du Toit (2014), qualitative and quantitative approaches represent different ends of a continuum in whose middle resides mixed methods that incorporate elements of both qualitative and quantitative approaches. Nonetheless, this does not mean that mixed methods use both methods. Still, on the contrary, it involves using both approaches in tandem so that a study's overall strength is higher than qualitative or quantitative research (Du Toit 2014). Although this research design is skewed toward quantitative methods, cases were selected using qualitative techniques, as will be explained later.

Source of data. Although, according to Du Toit and Mouton (2013), an evaluative research design uses a hybrid data source, secondary data will be the primary source of data used in this study; however, not the only one. According to Bhattacherjee (2012), "[s]econdary data analysis

is an analysis of data that has previously been collected and tabulated by other sources. Such data may include data from government agencies." This author continues explaining that "[s]econdary data analysis may be an effective means of research where primary data collection is too costly or infeasible, and secondary data is available at a level of analysis suitable for answering the researcher's questions." MacCallum, Babb, and Curtis (2019) state that "[t]hanks to the advances in online technologies, and growing capacity to store digital datasets, there is now an abundance of secondary data about places and people, which is good news for planners who rely on varied sources of data to describe, analyze, and visualized spatial characteristics and phenomena in cities and regions."

In turn, Du Toit (2014) declares that:

> given the enormous advances over the last decades in accessing and manipulating digitally available information (the most typical example being the Internet), researchers ought to make much more use of secondary data sources. Certain databases, such as census databases, can be seen as primary or secondary in the sense that the data are in a semi-raw format, but have already been collected and captured.

The use of secondary data is with no pitfalls, such as not having a clear sense of the overall quality of the data, which might lead to the risk of making errors when interpreting analysis. To avoid these risks, MacCallum, Babb, and Curtis (2019) advise the following seven steps, being the first step to identify the types of relevant databases carefully. Hence, these authors discuss eight relevant databases for planning researchers, such as government agencies. Accordingly, MacCallum, Babb, and Curtis (2019), assert that government agencies "often have extensive datasets on users of services and spaces, modelling and forecast such as population forecasts, and data concerning social and economic activity. The government often makes the

data available to commercial, university, and community users to allow broader use of datasets in applied research filed."

Consequently, governmental financial reporting, a set of financial statements prepared by state and local governments for the public on annual bases, will be the primary secondary data used. Finkler et al. (2017) state that governmental financial reporting standards are "developed by an accounting rule-making body, the Governmental Accounting Standards Board (GASB). GASB's official pronouncements are considered Generally Accepted Accounting Principles (GAAP) for U.S. state and local government." This governmental financial reporting prepared following the GAAP (based on the standard established by the GASB) is called the Comprehensive Annual Financial Report (CAFR). In June 1999, the GASB released Statement No. 34, which requires governments to use a revised financial reporting model consisting of three parts: 1) Management's discussion and analysis (MD&A), 2) Basic Financial Statements (BFS), and 3) Required Supplementary Information (RSI).

Finkler et al. (2017) and Mead (2018) show and explain every section of this revised CAFR, from which the BFS are the most critical components. BFS contains essential information about a government's finances (Mead 2018). BFS includes two major categories: government-wide financial statements and fund financial statements (Finkler et al. 2017). Hence, government-wide financial statements are comprised of a statement of net position and a statement of activities. In contrast, fund financial statements are comprised of governmental funds, proprietary funds, and fiduciary funds and component units.

Population, the unit of analysis, units of observation, and sampling

The population, all the units of analysis that contains the characteristics under study and from which cases will be selected for this study, will be Alabama's 1,208 local governments. Hence, the unit of analysis, the targeted object of this investigation and from which data will be collected to measure its characteristics, is "local governments." Otto and Swenson (2006), define local government as all agencies or bodies having an organizational existence, governmental character, and substantial autonomy. Institutionally speaking, Honadle (2013) illustrates that the Census of Government conducted by the U.S. Bureau of the Census is the "definitive source of data on the number of units of government in the United States."

According to Honadle (2013), the census definition and classification of different types of local governments are of two broad categories, general-purpose local governments and non-general purpose local governments (or only special-purpose local governments). The former is comprised of counties, municipal governments, and township governments, while the latter is comprised of school district governments and special district governments. Mead (2018) states that nowadays there are nearly 90,000 local governments in the U.S. In this study, the term local government is used broadly to encompass both categories general purpose and non-general purpose local governments, therefore, the term "locality" will be used to refer to all type of local governments.

The U.S. Census Bureau's new dissemination platform: data.census.gov is an archive system for accessing historical data from the Census of Government. This data tool shows, using data from the 2012 Census of Governments, that Alabama has 1,208 local governments in 67 geography areas. From those 1,208 local governments, 528 are general-purpose local

governments, while 680 are special-purpose local governments. The 528 general-purpose local governments are comprised of 67 counties and 461 municipalities, while the 680 special-purpose local governments are comprised of 548 special districts and 132 independent school districts.

As can be seen, Alabama is a state with a population of localities from which it might be doable to select a sample of localities to work with using probabilistic methods. However, the typology and corresponding overlapping feature of Alabama's localities, along with the need to have a sample size, also determined through statistical procedures, made it unfeasible to work with a probabilistic sample. For example, several online sample size calculators were tried, but they always produced an unpractical (too high) number. Moreover, given that every locality is unique regarding its use of discretionary economic incentives, as well as its public finances, and the relationship among its incentive programs and its finances, then to seek external validity (to generalize results and conclusions) is not a primary concern here.

Most importantly, as it was stated in the preceding section, there is an essential data requirement that every chosen locality must meet in order to be able to perform the analysis. Every locality must have good record-keeping of its comprehensive annual financial reports (CAFRs), and it must be of easy access to the public at large. Simultaneously, every locality also must have a robust discretionary incentive program, to the extent that LEDMs can negotiate and grant them on individual bases, and whose monetary value can be easily tracked. It is also essential, for the sake of keeping the analysis straightforward, to exclude all localities that have used any type of financial aid from the state or from the federal government to craft financial incentive packages to lure business.

These data requirements exclude many Alabama localities, for which the likelihood of having selected many useless localities by drawing a probability sample is significant. Due to all

these considerations, working with a probability sample is unfeasible, and therefore a non-probability sampling technique must be used. There are several nonprobability sample techniques, two of which are snowball sampling and purposive sampling. According to O'Sullivan, et al. (2016), snowball sampling refers to a situation in which members of a population cannot be located quickly by other methods and where the member of a population knows or are aware of each other. For example, this technique can be applied if it is necessary to sample members of a professional group who form informal networks or other elites, or when it is necessary to sample members of small populations who are not easily distinguishable from the general population. In this sampling technique, each member of the targeted population who is located is asked for names and contact information of other members.

On the other hand, in purposive sampling, the primary selection criterion is the investigator's judgment (for which is also known as judgment sampling) through a series of strategic choices about with whom, where, and how one does one's research; that is, the researcher exercise considerable discretion over what observations to study (Johnson and Reynolds 2012; O'Sullivan et al. 2016; and Palys 2008). This feature implies that this sampling technique must be tied to the researcher's objectives and that the best way to carry out this sampling technique depends on the context in which researchers are working and the nature of their research objectives (Palys 2008). Nonetheless, the literature on this sampling technique acknowledges subtypes, among which is criterion sampling, this subtype of purposive sampling involves searching for cases or individuals who meet a specific criterion (Palys 2008).

In other words, criterion sampling is a kind of purposeful sampling of cases on preconceived criteria (Sandelowski 2000). According to Palinkas et al. (2015), when criterion sampling is used to select participants from agencies, organizations, or systems, "individuals are

selected based on the assumption that they possess knowledge and experience with the phenomenon of interest . . . and thus [they] will be able to provide information that is both detailed (depth) and generalizable (breadth)." Accordingly, for these authors, participants who meet or exceed a specific criterion or criteria possess intimate (or, at the very least, superior) knowledge of the phenomenon of interest by virtue of their experience, making them information-rich cases (Palinkas et al. 2015). Furthermore, Palinkas et al. (2015) describe how Green and Aarons (2011) used a combined snowball/criterion nonprobability sampling strategy, which served as a theoretical foundation, and it justifies, methodological speaking, the procedure followed in selecting the localities under investigation in this research.

Hence, a combined snowball/criterion sampling strategy was implemented as follows. A visit to Auburn University's Government and Economic Development Institute was made, to ask for advice about which localities to include in this research. After explaining the research design, goals, and data requirements to the first interviewee there, he referred to another member of the institute. In turn, this other member of the institute gave the name of the current deputy secretary of the Alabama Department of Commerce as a known expert on the research topic who could advise better. Ms. Angel Till[7] turned out to be a real expert who possesses ample and intimate knowledge of this research topic by virtue of her experience developed over two dozen years of working with the financial and tax-related aspects of incentive, along with a deep experience working with economic developers across the state.

Hence, after learning about Ms. Till's professional credentials, she became an information-rich participant who was able and willing (since she kindly accepted) to guide the

[7] http://www.madeinalabama.com/2014/07/angela-till/

selection of localities to investigate. Moreover, aside from her expertise, she has both a formal and informal network of known professionals and practitioners, she could also consult to assist in selecting localities to conduct the analysis. Thus, she was contacted and informed of the research design, goals, and data requirements. This time, particular emphasis on the specific data needed to perform the analysis was stated as the most critical selection criteria. Hence, she took a couple of days to consult with her network to advise later to work with: the city of Montgomery, Chambers County, the city of Huntsville, the city of Mobil, and the city of Auburn. Unfortunately, Chambers County's comprehensive annual financial reports were not found; therefore, it was dropped from the study.

Wrapping up, Alabama local governments, as defined by the Census of Government conducted by the U.S. Bureau of the Census, are the population of this research. Therefore, the local government is the unit of analysis. In turn, the city of Montgomery, the city of Huntsville, the city of Mobil, and the city of Auburn are the units of observation or cases from which data will be analyzed and findings reported. This unit of observations was selected using a combined snowball/criterion sampling strategy with the help of personnel from Auburn University's Government and Economic Development Institute and the Alabama Department of Commerce.

The Methodology

Measuring government financial indicators

The following section provides background information that was of help to designing the instrument or tool developed here to analyze data, as well as the operationalization of concepts into variables. Variables' operationalization and the construction of the analytic tool were made possible after scrutinizing the literature on measuring governments' fiscal health. Notably,

financial condition analysis, which, according to the literature, can be scrutinized and measured using ratio analysis; these studies and techniques belong to the field of public financial management.

Mead (2018) asserts that a financial condition analysis (FCA) is a "comprehensive barometer of a government's overall fiscal health." When citing Robert Berne (a well-known scholar of government's financial analysis), Finkler et al. (2017) states that FCA is the study of the "probability that a government will meet both (a) its financial obligations to creditors, consumers, employees, taxpayers, suppliers, constituents, and others as they become due and (b) the service obligation to constituents, both currently and in the future." Wang (2012), proclaims that FCA "helps the government determine its ability to support and sustain its current level of services to citizens, . . . can detect the possible trend of a deteriorating financial condition . . ., [and] helps the government make informed decisions in the planning and budgeting process." Put it simply, the ultimate purpose of FCA is to identify the factors that impact governments' financial conditions to provide recommendations to improve it (Wang 2014).

To conduct FCA is not an easy task, as the government's financial condition must be "conceptualized in a matter that acknowledges its multiple time frames and the complexity of government fiscal action, which suggests that financial condition is not static" (Jacob and Hendrick 2013). For Wang (2014), the difficulty level of conducting FCA is determined by three factors 1) the scope of the analysis, 2) the availability of measures and data, and 3) the FCA modeling (which refers to the specification and testing of how a financial condition is affected by socioeconomic/organizational factors). Clearly, and as it will be shown next, this research will borrow from FCA's concepts and measurement techniques.

It does not exist a consensus on how to measure FCA; instead, "measurement systems that arose were dependent on the preferences of the researcher, their unit of analysis, and the data available to them. As a result, considerable disagreement exists within the literature on how [FCA] can best be measured" (McDonald III 2017). Accordingly, many measurement approaches have been developed by state governments, scholars, and practitioners as ad hoc versions to fit the government's needs. See for example Brown's 10-point test (1993), and its subsequent refinement works such as Mead (2006), and Maher and Nollenberger (2009); Chaney, Mead, and Schermann (2002); Wang, Dennis, and Tu (2007), and its subsequent refinement work by Arnett (2014).

Among associations representing professionals in local government management, the work of the ICMA excels. The ICMA's Financial Trend Monitoring System developed originally by Groves, Godsey, and Shulman (1981), and revised later by Groves, and Valente (1994), and by Nollenberger (2003). Nowadays, it is comprised of 42 indicators for evaluating the financial condition of cities and counties. Additionally, some states have developed their systems of measuring the fiscal health of their local governments. The Pew Charitable Trusts (2016) reports how 22 states monitor local government fiscal health. See, for example, the Florida Auditor General's financial condition assessment procedures, as well as Michigan's 10-point scale for fiscal distress developed in partnership between the Michigan Department of Treasury and the Institute for Public Policy and Social Research at Michigan State University (Kleine, Kloha, and Weissert 2003; and Kloha, Weissert, and Kleine 2005).

All previously cited FCA's measurement approaches have two characteristics in common: (1) every indicator used in each approach is made up by ratios (being each ratio an individual indicator); and (2) once calculated, those indicators (in the form of ratios) are

combined into a composite measure resulting into a scale or an index. Thus, all cited work are examples of different fiscal health scales or indexes (whose purpose is to measure the fiscal health of a city, locality, or a state) produced by the FCA's literature.

McDonald III (2017) defines the examination of ratio analysis as "the examination of a financial relationship between items as a means of identifying trends in financial behavior or position." According to this author, the "use of ratios provides a degree of standardization for a government to capture its results over time or against other organizations" (McDonald III 2017). Jacob and Hendrick (2013) illustrate the challenges of assessing the government's financial condition as it is a complex multidimensional phenomenon, frequently context-specific, with causal factors often operating nonlinearly. The same can be said about studying the long-term fiscal consequences of using economic incentives to lure businesses, as shown in the preceding chapter, more so if we want to analyze this situation using FIA methodology.

FCA pundits use several financial ratios that are later combined into scales, indexes, or scoring systems to cope with this challenge. According to Johnson and Reynolds (2012), this is a suitable measurement strategy that permits researchers to "capture numerous aspects of a complex phenomenon while representing the existence of that phenomenon in particular cases with a single representative value." Additionally, for Johnson and Reynolds (2012), the usefulness of indexes stems from the enhanced accuracy of a measure, simplifying the researcher's data by decreasing them to a more manageable size and increasing the level of measurement of a phenomenon. When commenting on the decision rule to use, Justice and Scorsone (2013) state, "[o]ne advantage of compiling a single composite index number and a set of categories . . . is that it makes possible a simple decision rule that can be employed (once the index is designed and calculated, at any rate) by a non-specialist."

The focus of this research is to analyze the long-term impact or influence of economic incentives over four fiscal dimensions. As demonstrated in the previous chapter, this topic suffers from the same challenge Jacob and Hendrick (2013) mentioned about the assessment of the government's financial condition. That is, this is a complex multidimensional phenomenon, frequently context-specific, with causal factors often operating nonlinearly. Moreover, since FCA measurement literature has already produced ratios that can be used to analyze and measure the government's fiscal dimensions, those ratios will be used to build the total fiscal effects index. With the help of these ratios, it will be possible to perform a trend analysis per category. Most importantly, it will be possible to establish a simple decision rule to determine whether localities fell into a winner's curse scenario (as defined in the previous chapter: $B' - B'' < C$ or $B' \gtrapprox B'' < C$) or whether localities got fiscal surplus as a consequence of having granted economic incentives.

Operationalization of concepts into variables

MacCallum, Babb, and Curtis (2019) illustrate that some additional techniques are available to transform the data into more valuable forms when working with secondary data. These authors also state that when having "several variables that collectively seem to characterize an aspect of planning important to your research question. These variables may be able to be combined to create an index or indicator — a combination of factors measured in a single value." These authors explain how planners use indices and indicators to measure complex phenomena. Thus, the rest of this section will outline the strategy to operationalize the total fiscal effects.

As stated in previous sections of this chapter, the idea of the total fiscal effects index stems from the strategy used by public financial management scholars, practitioners, and economic development organizations. In doing fiscal health analysis for state and local governments, these public financial management pundits have built several indexes or scales using financial ratios, thus further developing the subfield known as financial condition analysis. FCA's pundits realized that assessing the governments' financial condition was challenging since it is "a complex multidimensional phenomenon, frequently context-specific, with causal factors often operating in a nonlinear way" (Jacob and Hendrick, 2013).

The previous chapter made a thorough revision of FIA as a tool to assess projects aimed at boosting local economic development, specifically projects involving DEI. Such revision sheds light that FIA is a limited tool to forecast accurately and to measure future impacts over public finances when, for example, discretionary economic incentives are used. Furthermore, FIA is most used to forecast impacts but not to gauge the occurred effects of realized projects. That is, FIA is not used as an ex-post assessment; in the case of the use of discretionary economic incentives, FIA is useless as a post-award evaluation tool.

The previous chapter also reviewed the work of scholars who have analyzed directly or indirectly the impact of DEI over public finances. The work of Patrick (2014; 2016) and Hurwitz (2015) shed light on the potential long-term consequences over public finances when LEDMs grant DEI packages. Hence, according to these authors, such impacts go over: local public revenues, the tax burden, local debt, and the ability of localities to pay for services for its residents. The work of these scholars also uncovers the possibility of effects being either positive or negative.

Consequently, to bridge DEI with those four fiscal dimensions, FCA provides financial ratios that enable us to measure the impacts of DEI over the fiscal dimensions. However, since each of the four dimensions only represents partially the total fiscal effect (using FIA jargon) of using DEI over public finances, then it is necessary to aggregate them into a single measure that will allow us to test the existence or non-existence of the winner's curse phenomenon in the context of local economic development. This single measure will be an index, the total fiscal effects index.

Indexes are a way to aggregate and manipulate data (Scavo 2008). In elaborating on this point, Scavo (2008) shows that researchers on local economic development make ample use of this data aggregation technique. The suitability of indexes arises due to the need for producing single representative scores of complicated phenomena (Johnson and Reynolds 2012). Thus, O'Sullivan et al. (2016) define an index as a "set of variables used as a measure for a more abstract concept," while for Babbie (2016), an index is a "type of composite measures that summarize and rank-orders several specific observations and represents some more general dimensions." For Bhattacherjee (2012), creating an index involves conceptualizing the index and its constituent components, operationalizing and measuring each component, and creating a rule or formula for calculating the index score. Next, these steps will be taken comprehensively, according to O'Sullivan et al. (2016), Babbie (2016), and Mazziotta and Pareto (2013).

The total fiscal effects index (T.F.E.I.), the dependent variable (DV)

The first step in developing a measure –such as an index— is to define and describe the concept to be measured (O'Sullivan et al. 2016). Such a definition should give a clear sense of what is being measured by the index and refer to a theoretical framework linking various subgroups and underlying indicators (Mazziotta and Pareto 2013). Accordingly, the concept

being measured here is the total fiscal effects regarding using discretionary economic incentives policy used by LEDMs. As indicated before, the total fiscal effects can take the form of either a fiscal surplus or a fiscal deficit.

The second step in building an index is the selection of items, or in this case, the selection of financial ratios. The selection of each ratio obeys face validity as each ratio makes intuitive sense in measuring one of the four aspects of the total fiscal effect; additionally, each ratio stems from a thorough FCA literature review. Every ratio also partially represents a dimension, which makes them relevant and representative in collectively covering all characteristics of the dimension they represent in a balanced way. Each of the four dimensions is theoretically and conceptually related to measuring the total fiscal effects; however, each of the four dimensions is different among them, and each has its nuances. For this reason, different ratios were selected per dimension. Hence, every dimension of the total fiscal effects is built by specific ratios. Accordingly, the following section is a presentation of each financial ratio that was selected to measure the four fiscal dimensions.

T.F.E.I individual components.

1) Local Public Revenues Ratios:

$$Own - Source\ Ratio\ = \frac{Revenues\ of\ Own\ Sources}{Total\ Revenues}$$

This first ratio indicates the level of revenue that comes from the government's sources, such as taxes, charges, fees, and other revenues. A higher own-source indicates a higher level of budgetary solvency (Wang 2014).

$$Intergovernmental\ Revenues\ = \frac{Intergovernmental\ Operating\ Revenues}{Gross\ Operating\ Revenues}$$

In this second ratio, an increment of intergovernmental operating revenues as a percentage of gross operating revenues is viewed unfavorably, as it may indicate an overdependence on these revenue sources (Nollenberger 2003).

$$Risk\ Exposure\ Factor\ = \frac{Investment\ Revenues + Intergovernmental\ Revenues + Transfers\ In}{Own\ Revenue\ Sources}$$

This third ratio represents the percentage increase in the revenue sources that the government directly controls that would be required to make up for a 1 percent shortfall in those revenues that might decline due to factors totally outside of the control of government (Finkler et al. 2017; and Mead 2018).

2) Taxes Ratios:

$$Tax - to - Income\ Burden = \frac{Total\ taxes}{Personal\ income}$$

According to Berne (1992), this fourth ratio provides a sense of jurisdiction's ability to raise additional revenues. It also can help to assess the level of taxation beyond which taxpayers are not willing to go. When compared with the state average, regional average, or the average of other localities, this ratio can also give some sense of both the fiscal pressure on taxpayers and the political will to tax. Norcross and Gonzalez (2018) assert that a lower value of this ratio is good for the local fiscal health, while a high value indicates the presence of a financial risk if the locality experiences a sudden downturn. This because the locality will have difficulty responding to increased demands on their budgets if a hard time hit.

$$Tax\ Limit\ Exhausted\ = \frac{Tax\ Levy}{Tax\ Limit}$$

This fifth ratio measures the extent to which a locality has exhausted its tax limit. Percentage increasing over time could be an indicator that tax is growing faster than the real property tax base. As localities approach their tax limit, it loses flexibility in its revenue structure and may not be able to sustain the current LOS provided to its citizens (Office of the New York State Comptroller 2003).

3) Local Debt Ratios:

Local debt has to do with the government's solvency or the "government's ability to fulfill its obligation" (Mead 2018). This solvency can be assessed using leverage ratios and or coverage ratios, "[w]hile leverage ratios examine the amount borrowed, coverage ratios examine the capacity to make payments" (Finkler et al. 2017). According to Mead (2018) these solvency ratios focus on a government's long-term obligations. Additionally, "a set of ratios that addresses similar concerns as coverage ratios are known as ability-to-pay ratios" (Mead 2018).

$$Liabilities - to - assets = \frac{Total\ Liabilities}{Total\ Assets}$$

Mead (2018) and Finkler et al. (2017) present a similar version of this (sixth) leverage ratio. Finkler et al. (2017) assert that this ratio "examines the extent to which the organization uses debt to finance the acquisition of its assets." Mead (2018), in turn, asserts that it measures "the degree to which a government's assets are financed through borrowing and other long-term obligations." A general rule of thumb is that no more than half of the organization's assets should be financed with debt. Thus, less than point five is acceptable, while bigger than point five threatens the organization.

$$Debt\ Service\ Burden = \frac{Total\ Debt\ Service}{Total\ Revenue}$$

According to Finkler et al. (2017), this (seventh) ability-to-pay ratio "refers to long-term debt principal payments and interest on both short-term and long-term debt. The debt service burden indicates how much of each dollar of the government's revenues are spent on debt service." A ratio bigger than point two is considered a warning signal, while an acceptable value is point one or less.

$$Available\ Legal\ Debt\ Limit = \frac{General\ Bonded\ Debt}{Legal\ Debt\ Limit}$$

This eighth ratio was created by Crawford & Associates (a CPA firm specialized in governmental accounting and consulting) as part of the financial capability ratios of its Performeter (which is a financial analysis and rating tool for use in measuring a government's financial health). It is a measure of the government's capacity to issue general bonded debt. It aims at answering the question of whether the government will be able to issue more long-term general bonded debt if needed.

4) Service-level solvency Ratios:

One –and probably most important function— of local governments is to provide its residents with goods and services. In the process of delivering goods and services, a local government engages in financial obligations in the form of expenses, expenditures, and debt that must pay to its creditors. If a local government can pay without financial hardship, then its ability to pay (solvency) is good, and therefore it has a good financial condition. According to Wang, Dennis, and Sen (2007), there are four dimensions of solvency associated with governments' financial condition. One of those four dimensions is the service-level solvency. For Wang (2014), this dimension "refers to the ability to support a desirable level of services financially."

Put it shortly, service-level solvency measures governments' ability to provide and pay for LOS necessary for local government residents' general well-being.

To operationalize service-level solvency, Wang, Dennis, and Sen (2007) propose three different ratios, which are tax per capita ratio, revenue per capita ratio, and expenses per capita ratio. Arnett (2014) explains that the firsts two indicators assess the revenue and tax burden on local government residents, while the third one assesses the cost of providing services to local government residents. Additionally, Arnett (2014) asserts that "a higher value on these three indicators suggests lower overall service-level solvency. Higher values suggest higher revenue and tax burdens (and lees room for increases) and higher cost of providing services." Following the three ratios.

$$Tax\ per\ Capita = \frac{Total\ Taxes}{Population}$$

In this ninth ratio, "[h]igher tax per capita indicates a higher tax burden for residents and lower service-level solvency" (Wang, Dennis, and Sen 2007).

$$Revenue\ per\ Capita = \frac{Total\ Revenues}{Population}$$

In this tenth ratio, "[h]igher revenue per capita indicates a higher revenue burden for a resident to pay and lower service-level solvency" (Wang, Dennis, and Sen 2007).

$$Expenses\ per\ Capita = \frac{Total\ Expenses}{Population}$$

In this eleventh ratio, "[h]igher expenses per capita indicate a more expensive government and lower service-level solvency to sustain that expense level" (Wang, Dennis, and Sen 2007). Jointly, these eleven ratios serve as the raw material to build an index, the total fiscal

effects index (T.F.E.I.), which will serve as the dependent variable in this study. Also, the specific data required to calculate each ratio can be found in the codebook in the appendix— next, the path followed for constructing the T.F.E.I.

Scoring, normalization (standardization), weighting, and ratios aggregation. This section describes the mechanical procedures to build an index after been defined, and their components been selected. This segment greatly benefited and heavily relied upon the insights gained by O'Sullivan et al. (2016), Babbie (2016), and Mazziotta and Pareto (2013). Hence, this section outlines the methodology to follow in the construction of the total fiscal effects index. After selecting the individual index items, components, or indicators –in this case, the financial ratios— the next steps are to assign scores to each item, which is to decide the range value of every item. Then, individual items must be normalized or standardized to ensure comparability among them, as well as to avoid undue influences on the index. Furthermore, a decision about weighting its four dimensions must be made. The final procedure is to combine the items into a single index.

1) Scoring:

Working with financial ratios makes scoring a matter of less concern since the range of ratios' possible values is predetermined for their units of measurement and the size of their numerators and denominators. Hence, the value range of the T.F.E.I. can also be predicted by analyzing the composition of the eleven financial ratios that compose it. For example, ratios one to four and six to eight have a monetary value as their numerator and denominator, while ratio five has a percentage of monetary value as its numerator and denominator. On the other hand,

ratios nine to eleven uses the population as their denominators and monetary value as their numerators.

Consequently, and given the financial items measured in these ratios, ratios one, two, four, five, and eight are expected to have outcomes smaller than one as their numerators are likely to be smaller than their denominators. Ratios three, six, and seven, however, may have results bigger, equal, or smaller than one depending upon the size of their numerator and denominator. Finally, ratios nine to eleven are expected to have outcomes bigger than one as their denominators are likely to be smaller than their numerator. That is, the range of the ratios' possible outcomes goes from zero to decimals, to one, and some units bigger than one. However, the ceiling or maximum possible outcome will be revealed until having done the calculations of all ratios for all years in all cases. The same range of values is expected for the T.F.E.I because the index will be the aggregation of the eleven ratios after being normalized and weighed as it follows next.

2) Normalization (Standardization):

Although, in this case, it is neither necessary nor possible to assign a range of value to each ratio, the previous session revealed the existence of variation in the value ranges of the ratios. Put is simple; different ratios have different ranges of value. There is variation in the value ranges within subgroups or dimensions of the total fiscal effects. Ratios that collectively measure the state of debt in localities exemplify the situation. Ratios six and seven have expected value range equal to one, less than one, or higher than one; on the other hand, ratio eight has an expected outcome less than one. How can these three ratios be aggregated without mistakenly

allowing the ratio with a more significant value range to contribute more with the overall measure of debt if the three ratios are deemed equally important?

To avoid unintentionally granting to a ratio higher weight on the index than the other ratios is necessary to bring all ratios to the same standards by normalizing them to ensure comparability. There are several ways to do this, for example, Mazziotta and Pareto (2013) mention various methods of normalization, such as ranking, re-scaling (or min-max transformation), standardization (or z-scores) and indicization (index number transformation or 'distance' to a reference). However, O'Sullivan et al. (2016) suggest using z-scores to standardize measures for an index in comparable units. Burchell et al. (1981) pioneered the use of this normalization technique in what is an earlier work on measuring cities' fiscal distress using a composite index. Wang, Dennis, and Sen (2007) and Arnett (2014) calculated states' fiscal condition using four dimensions of solvency, each of which was comprised of distinct financial ratios that were normalized using z-scores. Consequently, following to Burchell et al. (1981); Wang, Dennis, and Sen (2007); and Arnett (2014) the eleven financial ratios that comprise the T.F.E.I. will be normalized using z-scores using the following formula:

$$z = \frac{(\chi - \bar{X})}{S}$$

Where: z is the zeta score

χ is the raw value for a financial measure

$\bar{X}$ is the average value for a financial measure

S is the standard deviation for a financial measure

There is yet another issue to be addressed to achieve comparability. This other issue was noted and corrected by Arnett (2014) by ensuring that higher or lower values of all ratios have the same meaning for all of them. In this case, ratios two to eleven have a negative meaning; the

higher their values are. However, this does not hold for the first ratio since a higher value has a positive meaning. Since the meaning of this ratio goes in a different direction than the others, then it is necessary to transform it. This transformation is done by taking the inverse of the original ratio, which is achieved by switching its numerator and denominator[8] so that a higher value will also have a negative meaning like the other ratios. Otherwise, the value of this ratio will cancel out with the value of another. Such cancellation would make the influence of both ratios to disappear over the index value.

Finally, it is important also to mention that this provides a hint of the decision rule to claim or to deny the presence of a winners' curse policy. The fact that higher values in all ratios have a negative meaning suggests that a locality will be judged as to suffer from the W.C. phenomenon if it has a higher composite index value. Conversely, if a locality composite index value approaches to zero, it will be indicative of a fiscal surplus (as defined in this investigation). Optimally, this will suggest that its discretionary incentive policy spurred a virtuous cycle of economic development, and therefore that this is a good economic development policy.

3) Weighting:

Normalization ensures comparability, but also grant equal weight to all items implicitly; in other words, normalization gives the same relative importance to all items. However, the item must contribute to the composite index in proportion to its importance. Therefore, if there are compelling reasons or reasonable basis for believing that one item or set of items are more important than others in contributing to the overall value of the composite index, then differential weighting must be performed. For Mayer and Greenwood (1980), a differential weighting is

[8] The reversion transformation outcome is defined as $A = \frac{1}{B}$, where $A = \frac{Denominator}{Numerator}$ is the reversed quotient, and $B = \frac{Numerator}{Denominator}$ is the original quotient. This because $A = \frac{\frac{1}{1}}{\frac{Numerator}{Denominator}} = \frac{Denominator}{Numerator}$

done by attaching numerical weights "to the value of each indicator according to its relative importance in the index. It should be noticed that the numerical weight does not necessarily reflect the size of the difference, merely that one indicator is relatively more important than others." Nonetheless, how to gauge the relative importance of each item? For Mayer and Greenwood (1980), this can be done based on "prior evidence, subjective judgment, or the value preference of the decision-maker."

In this case, equal importance to all ratio is assigned; however, remembering that we have four dimensions of the total fiscal effects, different relative importance per dimension is acknowledged. Therefore, it is necessary to weight each dimension differently so that its contribution to the overall composite value of the T.F.E.I. will be differentiated. Thus, in this research, ratios measuring the state of local public revenue have superior relative importance than ratios measuring the state of local taxes burden, and than ratios measuring the state of local public debt. Moreover, these two sets of ratios are believed to have equal relative importance among them, which in turn, is bigger than the relative importance of ratios measuring the state of government solvency to provide LOS.

The relative importance of theses sets of ratios over the composite value of the T.F.E.I. can mathematically be expressed as follows: local public revenues ratios > public tax burden ratios = public local debt ratios > local government solvency to provide LOS ratios. This differential weighting means that local public revenue ratios have a higher relative importance in the composite value of the T.F.E.I., while local government solvency to provide LOS ratios has lower relative importance in the composite value of the T.F.E.I. In numerical terms, this can be expressed by taking a range value that goes from zero to one where one represents the total relative importance. Hence .3 is assigned to set of ratios measuring local public revenues, .25 is

assigned to the sets of ratios measuring local public tax burden, and local public debt, while .2 is assigned to the set of ratios measuring local government solvency to provide LOS.

This numerical differential weighting will be attached to the composite value of every dimension of the total fiscal effects (as will be shown in the aggregation method discussed later), and it only ranks the relative importance of each dimension; thus, it does not reflect the size of the difference among them. Furthermore, this weighting stems from two criteria, the first is based on the literature review (performed in chapter two) about the components of FIA and its usefulness in reflecting the consequences of using a DEI to lure business, and the second is based on the usefulness of the ratios measuring each dimension of the total fiscal effects. In other words, differential weights were applied based on the degree of accuracy of every dimension in reflecting the long-term consequences of using DEI packages, as well as based on the degree of accuracy of the ratios in measuring a dimension of the total fiscal effects.

The main goal of this investigation is to analyze the public finance long-term fiscal consequences of using DEI. To overcome methodological hurdles, we are examining it by scrutinizing trends over the years (as discussed later) of revenues, taxes, debt, and government solvency to provide LOS. Explicitly, it is posited that the total fiscal effects are equal to direct revenue gains minus direct revenue losses minus indirect fiscal effects ($A = B' - B'' - C$, in mathematical terms). In turn, total fiscal effects can be measured by analyzing tendencies over time to see the exhibited evolution of revenue, taxes, debt, and government solvency to provide LOS. In a few words, the total fiscal effects equation's result and interpretation will be obtained through an indexed value of the total fiscal effects' four dimensions.

Revenue is the only element of the total fiscal equation with a directly corresponding dimension to be measured as the only element of the equation that will be measured directly has

more accuracy than the other three dimensions in reflecting the long-term consequences of using DEI packages. On the contrary, the other three dimensions, taxes, debt, and government solvency to provide LOS are indirect measures of the elements of the total fiscal effect equation. For example, local public debt and local government solvency to provide LOS are dimensions or fiscal aspects that reflex how positively or negatively DEI impacts direct revenue losses (B'') and indirect fiscal effects (C). For this reason, and in comparison, with the revenues dimension, taxes, debt, and government solvency to provide LOS are dimensions with less accuracy to reflect the long-term consequences over the total fiscal effects of using DEI packages.

Regarding ratios' usefulness to partially measure its corresponding dimension (or how well a group of ratios measures a dimension), Jacob and Hendrick (2013) illustrate that financial condition measures (in this case the eleven ratios selected) must the judged based on four attributes or properties that reflect important aspects of FCA. These attributes are time (future/current), policymaker decision capacity (controllable/uncontrollable), environment (internal/external), and steadiness (stable/volatile). In other words, a financial condition measure is useful if these attributes can be observed and analyzed with it. For the selected ratios in this study, a case can be made for the usefulness of ratios from one to eight as one, some, or all four attributes can be observed and analyzed to some extent with each ratio. However, there is an issue with the attribute "time" for ratios from nine to eleven.

For Jacob and Hendrick (2013), government solvency to provide LOS (or service-level solvency as they call it) is "a function of future events and features of the system that are less controllable and more external." In other words, government solvency to provide LOS "is a function of both current and future fiscal obligations and resources" (Jacob and Hendrick 2013). A comprehensive explanation of why this is a problem with measures of government solvency to

provide LOS is, according to Jacob and Hendrick (2013), that "current financial and service obligations often stretch into the future (e.g., debt and pension obligations), assessments of the current financial condition also must recognize current and likely future fiscal states. However, the future is unknown, making assessing long-run and service-level solvency imprecise."

For this reason, Arnett (2014) gave to service-level solvency dimension of her fiscal condition index less relative importance assigning it the lowest numerical value when weighting all dimensions in her index. Accordingly, the three ratios that are being used to measure the total fiscal effects' dimension of government solvency to provide LOS have less usefulness in measuring this dimension in comparison with the rest of the ratios that measure the other three dimensions of the total fiscal effects. In other words, ratios nine to eleven have less accuracy in measuring this dimension in comparison with the other ratios. Consequently, this dimension will have to exhibit less relative importance in the composite value of the T.F.E.I. than the other dimensions.

In conclusion, dimensions' accuracy degree in reflecting the long-term consequences of using DEI packages; and ratios' accuracy degree in measuring total fiscal effects dimensions are the two criteria used to determine the relative importance of each dimension. The "revenue" dimension is more important as it directly measures its corresponding total fiscal effects equation element. Also, its constitutive ratios handle well the four attributes or properties that reflect important fiscal condition aspects. In second place of relative importance are "taxes" and "debt" dimensions because they measure elements of the total fiscal equation indirectly, but their ratios handle well the four attributes or properties that reflect important fiscal condition aspects. Finally, the less relative importance goes to "local government solvency to provide LOS" because this dimension also measures elements of the fiscal equation indirectly and because its

constitutive ratios do not handle well the "time" (especially when it comes to the future) attribute or property of fiscal condition. That is, its constitutive ratios are imprecise measures.

4) Ratio Aggregation Method.

Once the value of all ratios per dimension has been calculated and normalized, the average value per dimension will be multiplied by its corresponding weight, and then the four values will be added to create a composite value. Hence, the score of the total fiscal effect index T.F.E.I will be calculated as follows:

$$T.F.E.I. = (normalized\ average\ value\ of\ local\ public\ revenue \times .3) +$$
$$(normalized\ average\ value\ of\ local\ tax\ burden \times .25) +$$
$$(normalized\ average\ value\ of\ local\ public\ debt \times .25) +$$
$$(normalized\ average\ value\ of\ local\ government\ solvency\ to\ provide\ LOS \times .2)$$

In mathematical notation this formula can be expressed as it follows:

$$T.F.E.I._l = \sum_{fr=1}^{FR} w_d I_{fr,l}$$

$$with \sum_{fr} w_d = 1\ and\ 0 \leq\ w_d \leq 1, for\ all\ fr = 1,..,FR\ and\ l = 1,..,L.$$

Where: *l* is a locality

L is all localities in the study

fr is a financial ratio

FR are all financial ratios used in the index

W_d is the weight associated with an individual fiscal dimension

$I_{fr,l}$ is the normalized average value of a dimension for a locality

At first glance, this might look like a straightforward method; however, this research has as a secondary goal to provide to LEDMs with a technique to analyze data that can be used even by untrained public servants tasked with evaluating its incentives program. That is, the methodology presented here reaches "procedural parsimony." As stated by Mayer and Greenwood (1980), "policy research interest lies in problem-solving rather than procedural elegance. Reliance on overly sophisticated techniques not only increases the cost of decision making but creates a barrier to democratic participation." Consequently, it is not advisable to use very elaborated, time-demanding, and time-consuming techniques that would prevent their use in the local economic development policy process.

Mazziotta and Pareto's flow chart for the choice of the best method. Acknowledging that "building a composite index is a delicate task and full of pitfalls," Mazziotta and Pareto (2013) provide general guidelines for constructing a composite index. These authors focused their attention on a quest for the most suitable method depending on four considerations: type of indicators (substitutable/non-substitutable), types of aggregations (simple/complex), type of comparison to be made (relative/absolute), and type of weights of the indicators (subjective/objective). Thus, it is suitable to conclude and summarize this section about constructing the total fiscal effects index (T.F.E.I) using Mazziotta and Pareto's (2013) insights. The flow chart below, built by Mazziotta and Pareto (2013), shows the path to creating the T.F.E.I. This path will be discussed next to conclude and summarize this section.

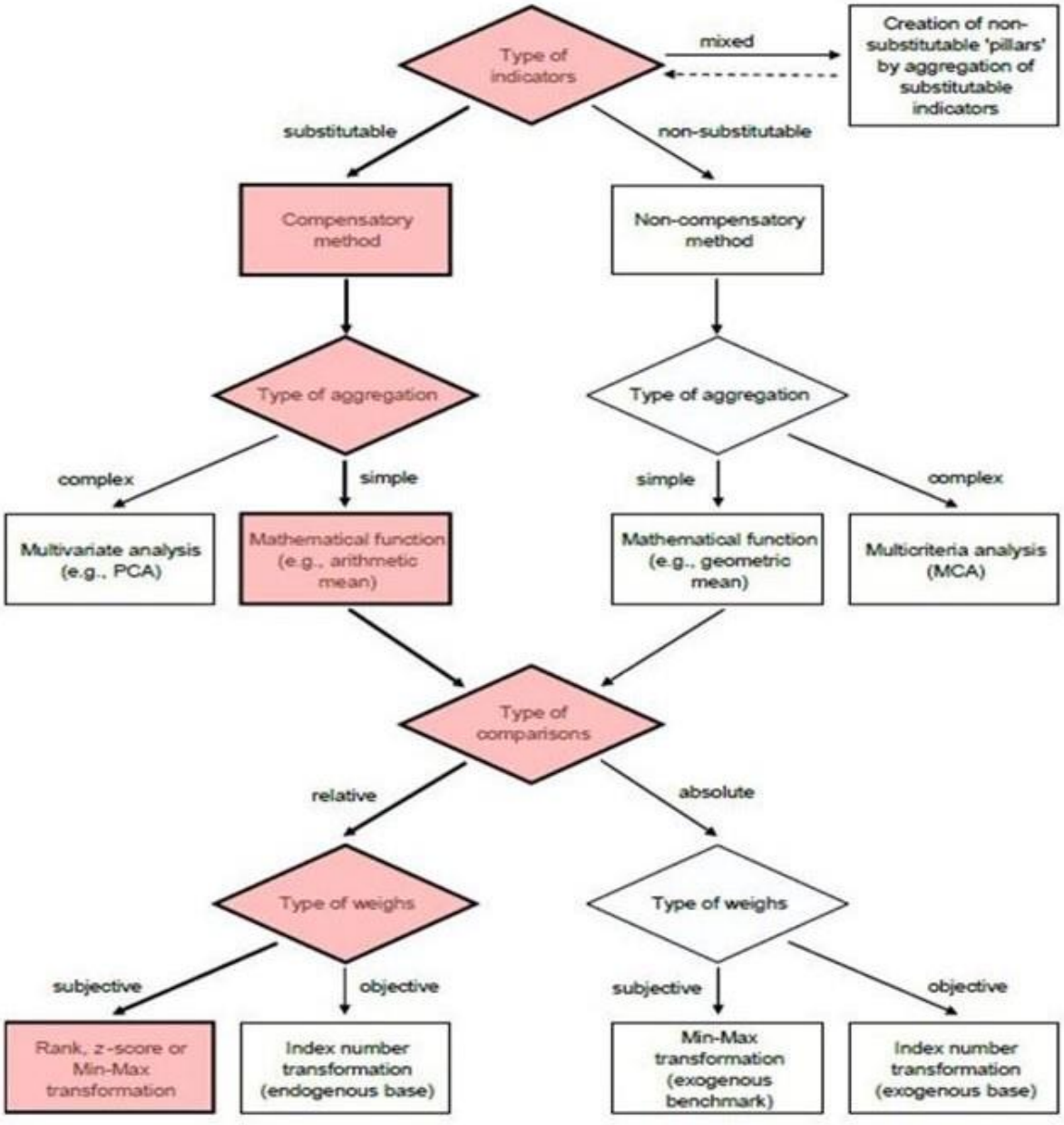

Figure 3.1. Path to build the T.F.E.I. according to Mazziotta and Pareto's flow chart. *Source:* Figure from Mazziotta and Pareto 2013, figure 2c

For Mazziotta and Pareto (2013), the type of indicator, which can be compensatory or non-compensatory, is one of the main factors that determine the choice of aggregation methods. In compensatory indicators, "a low value in one indicator or dimension masks a high value in

another; that is, a deficit in one indicator or dimension can be compensated for by a surplus in another" (Talukder, Hipel, and VanLoon 2017).

On the contrary, non-compensatory indicators "take into consideration differences in achievement across dimensions. Poor performance in any dimension or indicator is directly reflected in the composite indicator's value" (Talukder, Hipel, and vanLoon 2017). Thus, following Wang, Dennis, and Sen (2007) and Arnett (2014), the T.F.E.I is a composite linear aggregation in the form of a summation of weighted and normalized individual indicators. Nevertheless, this implies compensability among its eleven indicators as well as among its four dimensions, and this is an assumption that warrants further examination later in this chapter.

Consequently, a composite linear aggregation in the form of a summation of weighted and normalized individual indicators is considered a simple aggregation method. This is because "easily understandable mathematical functions are used" (Mazziotta and Pareto 2013). Regarding the type of comparison to be made, Mazziotta and Pareto (2013) assert that "[s]tandardization or transformation in z-scores permits only to make 'relative' comparisons over time since it is based on the mean and the variance of the indicators at the time of reference." As will be discussed later, comparison over time is one of the essential features of data analysis performed in this research. Thus, following Wang, Dennis, and Sen (2007) and Arnett (2014), standardization using z-scores is used.

Concerning the choice of a system of weights, although several weighting techniques that pretend to be objective exist (see, for example, the Handbook on Constructing Composite Indices), for Mazziotta and Pareto (2013) this step "necessarily involves the introduction of an arbitrary component." Nardo et al. (2008) acknowledge that "[r]egardless of which method is used, weights are essentially value judgments." Thus, subjective techniques, like the one

developed and used for the T.F.E.I., “reward (or punish) components that are deemed more (or less) influential, depending on expert opinion, to reflect better policy priorities or theoretical factors,” (Nardo et al. 2008).

Data analysis

After specifying the T.F.E.I. definition, constitutive ratios, and procedural construction, it is time to address how this measurement tool will work. In other words, this section describes how data will be analyzed using T.F.E.I. The steps to analyze the data collected will be the same as those to perform an FCA. Hence, this section relies on Wang’s (2012; 2014) insights about the procedure for conducting an FCA. It is also important to mention that one final step to follow when building an index is to validate the index. This last step was not included in the preceding section because an unintentional overlap exists between testing index reliability and validity (index validation) and how an FCA is conducted. Thus, this section describes the scope of the analysis, the determination of measures and data collection, the identification of trends, and how to explain the relationships identified. Furthermore, identifying and explaining trends and relations will also serve as a process to test the T.F.E.I validity and reliability.

The scope of the analysis. The main goal of this analysis is to develop a measurement device, a dependent variable, to evaluate four local governments’ discretionary economic incentive policies. Montgomery, Huntsville, Mobil, and Auburn are the four localities or cities to be analyzed. Once such a dependent variable is developed, performing a post-award or ex-post evaluation will be possible. Moreover, the timeframe for this evaluation will be ten years. Three years before the incentive package(s) was first granted, the year when the incentive was given, and six years after implementing this economic development policy.

Additionally, Wang (2012) asserts that "the purpose of an FCA is to find what affects financial conditions and how to improve it and identifying socioeconomic/demographic and organizational factors that affect financial conditions is a key requirement." For this reason, it is of vital importance to incorporate these variables into the analysis. Socioeconomic variables include personal income per capita and unemployment rate. The demographic variable will be the population.

Testing index validity. The T.F.E.I. must pass three testing criteria to be declared a helpful measurement tool. Those testing criteria (or index validation) are, according to Wang, Dennis, and Sen (2007) and Wang (2012), measurement reliability (internal consistency), measurement validity (external validity), and measurement affordability. Measurement affordability refers to finding less costly measures along with supporting data. With affordability, understood as the cost of obtaining and processing data, the opportunity cost was the most relevant cost in this investigation. Thus, parsimonious measures are preferred, for which less costly measures are better. In this case, data had no monetary cost but in terms of the time and effort spent in tracking, collecting, extracting, and analyzing the information used. Therefore, minimizing the opportunity cost significantly affected the selection of the eleven constitutive financial ratios of the T.F.E.I.

Regarding measurement reliability, Wang (2012) asserts that "[t]he elements used in formulating the measure should be consistent and objective." Consistency and objectivity have to do with minimizing random measurement errors. In practice, this is checked by assessing the degree of internal consistency. According to Wang, Dennis, and Sen (2007), the index, its dimensions, and its ratios must be correlated to ensure that they can be used to measure the same concept. Wang, Dennis, and Sen (2007) and Arnett (2014) put this to the test by assessing the

degree of association across ratios per dimension. Second, they evaluated the degree of association across the four dimensions. Third, they also evaluated how well their eleven ratios measure financial condition. In other words, they gauged whether the eleven ratios could be grouped individually to measure financial condition. These three steps will be applied to the T.F.E.I. and its components. While the Pearson correlation coefficient can be used to measure the first two associations (within dimensions and across dimensions), Cronbach-alpha is the most common estimate of the items' internal consistency in a measure.

Regarding measurement validity, Babbie (2016) calls it external validation and is defined as "[t]he process of testing the validity of a measure . . . by examining its relationship to other, presumed indicators of the same variable." For Wang, Dennis, and Sen (2007), this means that the measure, in this case, the T.F.E.I., "must be empirically associated with the variables that are related to it." Wang, Dennis, and Sen (2007) assessed the degree of association of socioeconomic variables that were expected to be related to the measure they worked with. This specific way to test measurement validity is known as "predictive validity."

For the case at hand, the long-run total fiscal effects of using DEI are believed to be associated with socioeconomic and demographic, as illustrated in chapter two and summarized in Patrick's (2014) conceptual map. In other words, to be valid, there must be a relationship between socioeconomic, demographic, and the substitute of organizational variables and the T.F.E.I. Simultaneously, the methodology for testing index validity is essential for the final steps in analyzing data, which will be discussed later. First, however, it is worth noting that socioeconomic and demographic must be selected according to a theoretical cause-and-effect relationship of how they affect public finances and their sensitivity to the policies or the public officials' organizational operations.

Identifying trends. According to Wang (2012; 2014), once measures have been developed and the appropriate and related information has been collected, it is necessary to examine the data to identify possible warning trends of deterioration. Deterioration, in this case, means three-period (in fiscal years) of sustained increment per index, financial dimensions, or ratios. However, warning trends will not be the only focus of the examination; positive trends must also be analyzed, given the possibility of DEI influencing total fiscal effects positively. This possibility means we will also pay attention to three periods (fiscal years) of sustained decrement or increment of the index, financial dimensions, or ratios. Changes also matter, as "fluctuation (rather than a continuation) of measures may also deserve a closer look" (Wang 2012; 2014).

Hence, a thorough examination will start by making a ten years comparison of the T.E.F.I score in every locality. Next, the same comparison will be made by breaking the index into its four dimensions (comparison per dimension). Finally, if a warning trend per dimension is identified, a closer inspection will be made by breaking the dimension into its constitutive ratios (comparison per ratio). In other words, a longitudinal analysis of the three-level (index, dimension, and ratio) will be performed as localities will be compared with themselves throughout time.

Reck and Lowensohn (2016) assert that regardless of the calculations, "the more difficult task is how to interpreter the ratios to make an informed judgment," in this case, about the total fiscal effects of having used incentives. For example, assuming a causal relationship between economic incentives and public finances was statistically demonstrated, the T.F.E.I. score must be high to be interpreted as a W.C. upshot (a fiscal deficit). Conversely, a low value will be interpreted as a fiscal surplus induced by incentives. Nevertheless, how high is too high, and how low is too low? Likewise, once a dimensional warning trend is identified, how severe is this

trend? For example, if this warning trend was identified for government solvency to provide LOS due to a high expenses-per-capita ratio, how bad is this high value for this ratio?

According to Reck and Lowensohn (2016), benchmarking is a handy tool to answer these questions. For these authors, a benchmark "broadly defined, is any target, range, or 'red flag' that provides an analyst with a basis for comparison in order to draw conclusions about whether performance indicators suggest good or bad news." Simply put, these indicators must be placed in context to be meaningful. Consequently, when financial ratios are at the core of the study, there are four sources of possible benchmarks, which can be classified as inside or outside of government (see Finkler et al. 2017; Justice and Scorsone 2013; Mead 2018; and Reck and Lowensohn, 2016). Benchmarks inside government are cross-sectional comparison (if they are similar enough) and longitudinal comparison (time series). Benchmarks outside government are industry and national examples.

An industry benchmark refers to municipal credit ratings agencies such as Fitch Investor Service, Moody's Investor Service, and Standard & Poor's, which "perform a credit risk evaluation of the municipality to advise potential investors of the city's creditworthiness" (Ammons, 2012). These benchmarks have been used when evaluating localities' fiscal health since creditworthiness involves similar financial measures as a fiscal condition. National examples or national ratings refer to localities that report their financial performance in a manner that could serve as valuable benchmarks for other localities wishing to improve their financial performance reporting. For a list of those localities that can be taken as benchmarks in different categories, see Ammons (2012).

Cross-sectional refers to comparison with a peer group. With this approach, the challenge is finding an appropriate peer group to compare. Justice and Scorsone (2013) state that this

challenge is due to "local governments' widely varying historical and environmental context and services mixes . . . different legal requirements and scope of government from state to state . . . and different political and managerial responses to environmental conditions [as defined by the ICMA financial monitoring system]." Scholars have used the Government Finance Officer Association GFOA financial indicator database to cope with this challenge. This database contains information from comprehensive annual financial statements submitted by localities certified for achieving excellence in financial reporting according to the GFOA guidelines. Also, the Lincoln Institute of Land Policy's Fiscally Standardized Cities (FiSC) database allows comparing local government finances for 150 of the largest U.S. cities.

A longitudinal comparison refers to the internal monitoring of trends throughout time within a locality. It is probably the most helpful method to evaluate if a locality has performed better or worse than in previous years. In fact, despite providing a database with information to perform a cross-sectional comparison, in 2003, the GFOA issued "The Used of Trend Data and Comparative Data Financial Analysis" for those localities wishing to use financial data from their CAFR to analyze government financial health. In this short publication, the GFOA (2003) recommends a minimum of five years and a maximum of ten years to perform the analysis; it also recommends accounting for inflation, seasonal, and cyclical patterns. It also provides six points to ensure comparability if a cross-sectional (or peer group) comparison is made[9].

[9] For the GFOA a meaningful cross-sectional or peer group comparison can only be made if localities are of the same level (state, county, municipal) and type (general purpose, special purpose), also differences in the scope, quality, and number of residents receiving LOS must be minimized. Localities also must define categories in the same way, and they must belong to similar regions where costs and similar environmental factors (community needs and resources, integumental constraints, and political culture) are comparable. If this is achieved and significant depreciation expensive are being compared, then capital assets must had been acquired roughly the same time. All these necessary conditions to ensure comparability illustrates how difficult is to perform a valid cross-sectional comparison.

Industry benchmarks are useless here, as their primary focus is to assess localities' creditworthiness, not even fiscal health. According to Ammons (2012), some national ratings have been used as benchmarks by LEDMs. National examples, as benchmarks, could be used after cross-sectional analysis (and the next and final step in data analysis) has been performed to enhance the validity of results. Two national ratings are the "Best Performing Cities Index[10]" and the "POLICOM's Annual Economic Strength Ranking[11]." Finally, regarding a peer group comparison, Justice and Scorsone (2013) make a compelling argument explaining all shortfalls for which cross-sectional comparison is inadequate as a benchmark. Conversely, these authors assert that "only longitudinal measures can support a confident inference about fiscal health and stress in the long term," where fiscal stress is most closely associated with what the T.F.E.I. was designed to measure.

Consequently, benchmarking is a fundamental feature of data analysis because financial ratios are the radix of the measurement tool developed to analyze the long-term fiscal effects of using DEI. In the words of Finkler et al. (2017), "any [locality] can make comparisons of its data over time. Trends can be seen unfolding by considering a ratio's value from year to year over a 3-to-5-year period. This comparison is often referred to as trend analysis. Gradual changes, either favorable or unfavorable, may be observed, and sudden sharp turnarounds, for better or worse, will be quickly discovered." Accordingly, searching for positive and warning trends is the main goal in this analysis stage, yet fluctuations will also be analyzed. As can be seen, this stage of the

[10] Compiled by the Milken Institute and Greenstreet Real State Partners, which ranks U.S. metropolitan areas from top to the bottom according to their performance in creating and sustaining jobs and economic growth (http://bestcities.milkeninstitute.org/).

[11] This benchmark ranks 366 metro areas and offers an alternative scoring system that features economic stability and consistency of growth among a variety of other factors in gauging economic strength (https://policom.com/rankings-micropolitan-areas/).

data analysis is the same as a time-series observational study (Kellstedt and Whitten 2013) or longitudinal (time series) design of which trend analysis is part (Johnson and Reynolds 2012).

Testing, specifying, and explaining socioeconomic, demographic, and organizational factors' influence. According to Wang (2012; 2014), the final step in conducting this type of analysis is to test, specify, and explain how (in this case) total fiscal effects are affected by socioeconomic, demographic, and organizational factors (collectively referred to as non-financial variables). This step has already been initiated when testing for the external or measurement validity of the T.F.E.I. The index's external validity is a function of a demonstrated relationship between its components and non-financial variables. A Pearson correlation test would suffice to claim that such an association does exist. A trend analysis brought the need to collect repeated measures or specific numbers of variables for ten years per locality; this also brings the need to collect the non-financial variables data for each locality during the same period.

Assuming that warning or positive trends are detected, it follows a more in-depth examination of the relationship between these trends and the non-financial variables. An in-depth analysis means disaggregating the index (to its dimension or ratio level) and analyzing the relationship with the non-financial variables. Thus, the socioeconomic variables selected for this study are 1) personal income per capita, and 2) unemployment rate. Personal income per capita is defined as personal income (in constant dollars) divided by population. According to Nollenberger (2003), this socioeconomic variable measures a community's ability to pay taxes, and credit rating firms also use it as a government's ability to repay debts. A declining trend translates into a declining consumer purchasing power that can ripple through the local economy.

Population change is the demographic variable of interest. According to Nollenberger (2003), "[t]he exact relationship between population change and other economic and

demographic factors is uncertain." However, chapter two described how DEI could induce population change and some possible consequences for the local public finances. For example, suppose population growth happens due to an influx of new workers in the community taking over the new jobs created by DEI. In that case, the indirect fiscal consequences are most likely negative.

Methodological constraints

There are two substantial methodological flaws worth mentioning concerning the research design used to conduct this investigation. The first is about selecting the cases or units of observations using a nonprobability technique. The second relates to high reliance on the author's judgment and expertise in the measurement strategy (building the index and interpreting its results). Next, it follows a discussion of both shortcomings.

Nonprobability Technique as Cases selection method. Nonprobabilistic sampling methods lack randomization in selecting units of observations. Case selection methods share this same feature; however, the former seems to take the absence of external validity for granted. Case selection methods, on the contrary, strive to generate representativeness of a population's cause-and-effect characteristics. In general, nonprobabilistic sampling methods are used in large-N studies. On the other hand, case selection methods are used in small-N studies. However, this distinction does not exclude the possibility of using a nonprobability sample technique in a small-N analysis, which is problematic due to the absence of external validity and the possibility of selection bias.

In its concluding remarks, Gerrin (2008), a prominent comparativist and a knowledgeable scholar on case selection methods, admits that pragmatic/logistical "considerations are often—and quite rightly—decisive in the case selection process." However, he warns that such

considerations do not qualify as a methodological factor in case selection because "features of a case have no bearing on the validity of the findings stemming from a study" (Gerrin 2008). Nonetheless, pragmatic and logistical considerations guiding case selection qualify as tenets of nonprobabilistic sampling. Echoing Gerrin, Henry (1990) states that "[w]hile the great risk of using purposeful samples [a type of nonprobabilistic sample technique] is the problem with external validity, the credibility of the findings is also at risk…because of bias in the selection process."

In a more reader-friendly, Saumure and Given (2008) explain that the two main concerns of nonprobabilistic samples are the non-transferability of the research findings to other groups and bias in selecting study participants, observations, or cases. Therefore, internal and external validity are at risk when choosing cases, not using one of Gerrin's (2008) nine proposed techniques but by selecting cases using other nonprobabilistic guiding principles. Nevertheless, internal and external validity is the "holy grail" of every research endeavor. Scholars attempt to uncover interesting, meaningful, and unknown cause-and-effect relationships about cases or units of observations under study. Simultaneously, scholars seek to find cause-and-effect relationships that are more general and applicable to other contexts and other cases or units of observations. Well aware of the trade-off between these two goals, scholars' ideal type is to achieve a healthy balance among them.

Given that non-randomization is a feature shared by nonprobabilistic samples and case(s) selection under goal-directed approaches (like the ones advanced by Gerrin), there is not much to do but acknowledge losing external validity. However, the possibility of selection bias, a threat to internal validity, is a subject matter that deserves more in-depth consideration. Selection bias can make the findings unreliable, not valid, meaning that the independent variable's variation

might not cause the variation in the dependent variable. In other words, selection bias might lead us to claim the existence of a causal relation that is, in fact, a spurious relationship or a faulty inference. Geddes (2003), a leading comparativist scholar, explains this possibility in a single sentence "the cases you choose affect the answers you get!"

To avoid committing an inferential felony due to selection bias, Halperin and Heath (2012) illustrate how the literature advises not to select cases on the dependent variable but to select cases on the independent variables. This approach implies doing a research design controlling theoretically important independent variables to test a specific hypothesis, reducing, thus, the risk of obtaining spurious relationships (Halperin and Heath 2012). In this regard, the value or the observation of the dependent variable (T.F.E.I.) did not play a role in selecting the localities under investigation. Instead, since a single hypothesized independent variable (the DEIE) affects a multidimensional phenomenon (localities' finances), it was necessary to craft an elaborated dependent variable (the T.F.E.I.), requiring thus the collection and aggregation of an ample array of data. For this reason, the main criterion was to select cases that would allow the operationalization of independent and dependent variables regardless of their observed or expected values.

Thus, a combined snowball/criterion sampling was the strategy to select cases to analyze, and it was the most suitable strategy given the lack of prior knowledge about which of all Alabama's localities could have the data required to conduct the analysis. However, the study's internal validity is good since this case selection strategy meets most of Kemper, Stringfield, and Teddlie's (2003) criteria[12]. External validity is the only casualty; however, one of this

[12] According to these authors: "(1) the sampling strategy should stem logically from the conceptual framework as well as the research questions being addressed by the study; (2) the sample should be able to generate a thorough database on the type of phenomenon under study; (3) the sample should at least allow the possibility of drawing clear inferences and credible explanations from the data; (4) the sampling strategy must be ethical; (5) the

investigation's goals is not to transfer conclusions to the population but to make a case for the measurement tool's transferability to all other Alabama localities. In other words, to show all other LEDMs across Alabama how they can perform the same type of analysis using their localities' data.

Author's judgment and expertise. Hrůza (2015) assesses the use of financial ratios in FCA. For this author, the primary shortcoming is "the little explicit theoretical structure or lack of universally accepted or even generally relevant theories and the dominant approach of pragmatic empiricism used for the creation of [FCA] concepts …[which] means a relatively high dependency on the creators' authority, abilities and skills and also experiential knowledge." Although this study is not strictly an FCA analysis, the dependent variable draws heavily from FCA literature as it is a set of ratios aggregated to create an index. As such, Hrůza's (2015) pinpointed shortcoming also reaches this study. Thus, the main peril does not stem from the subjectivity in the D.V. construction, as every ratio used is well justified theoretically after an extensive literature review. Neither is the challenge associated with accessing, gathering, and analyzing an enormous amount of information that must be consistent and comparable for multiple periods (Justice and Scorsone 2013), as a brute-force approach[13] (Slattery 2020) must suffice to overcome this challenge.

Instead, in this investigation, the second main methodological concern is the judgment-based approach to interpreting results. Justice and Scorsone (2013) explain this problem of the ambiguity of interpretation by acknowledging that "it is up to the individual analyst or local

sampling plan should be feasible; (6) the sampling plan should allow the researcher to transfer/generalize the conclusions of the study to other settings or populations; and (7) the sampling scheme should be as efficient as practical" (Kemper, Stringfield, and Teddlie 2003).

[13] This type of analysis requires extremely time-consuming data gathering and data entry from individual reports such as CAFRs.

government to supply interpretative guidelines for evaluating the significance of the trend and judging when their current values are such that a particular evaluation and response is appropriate." In other words, in interpreting results, a considerable emphasis is placed on the analyst's professional experience, knowledge of the locality, and judgment; because there is no standard by which a locality could measure the existence or magnitude of a problem (Justice and Scorsone 2013).

Simply put, "a trend analysis offers the analyst an opportunity to describe 'what is going on.' However, this approach offers few insights with respect to 'where one should be'" (Jacob and Hendrick 2013). A purposely previous over-description of this problem suggests the remedy: to get to know the locality well! Additionally, Jacob and Hendrick (2013) also advise that "[r]egardless of the approach and method chosen, the analyst should also employ some qualitative data collection. This could be done before the analysis to guide one with respect to the best approach and method, as well as after the study to help in the final interpretation of the result."

An effective way to do both, get familiar with the locality, and use qualitative data could be conducting structured interviews with individuals involved using DEI and localities' fiscal managers. Regrettably, this possibility is not part of the research design beyond unstructured conversations to collect data. Results interpretations will have to be literature-guided and, for academic honesty, must be acknowledged as a potential methodological flaw. The researcher's experience is also not a particular strength in this investigation. However, five years of intensive reading and self-education on the investigation's subject matter are the researcher's shield against this criticism of the researcher's inexperience.

Chapter 4

Data Sets, Analysis, and Results

Content of the Chapter

This chapter discusses the findings in building the T.F.E.I. for each of the four localities or cities analyzed; such a discussion will be twofold. On the one side, the aim is to judge and illustrate the index's suitability as a multi-dimensional dependent variable. On the other hand, an *a priori* analysis will revolve around the index values' meaning. To this end, it is necessary to make an important assumption. Suppose trends are located on the indexes (three or more sustained increments or decrements of the index value). In that case, it will be assumed that those trends are caused by the DEI expenditure incurred by the cities during the same period represented by the indexes. This *a priori* analysis will be possible using the theoretical insights on how incentives affect the public finances outlined in the second chapter.

Thus, the first section lays out the guiding principles used to interpret the results and the guiding principles to judge the data findings' reliability and validity. Then a caveat is discussed regarding the local tax fiscal dimension. Next, each city's data findings will be discussed. The discussion will center around each city line graph of its Total Fiscal Effect Index, as the main concern is identifying downward or upward trends. If a trend is identified, a backward induction process will follow for a deeper analysis by disaggregating the index.

Such disaggregated scrutiny needs the following information, a table with the Total Fiscal Effects Index (T.F.E.I.) and its Dimensions. A table with the Financial Ratios

(Standardized and Weighted values) followed by a table with raw values of the Financial Ratios and a table with the Financial Ratios Descriptive Statistics. After that, correlation tables will also be shown. The first set of correlation tables analyzes the degree of association across ratios per dimension; the outcome of the Cronbach alpha measure will also be reported. Then the degree of association across dimensions. Next, a table with the raw value of the T.F.E.I. and socio-economic and demographic variables. Finally, a correlation table will show the degree of association between the index and socio-economic and demographic variables.

Guiding Principles to Interpret and Judge the Quality and Usefulness of the Findings

Chapter three thoroughly discusses the selection criterion for each financial ratio and its value meaning. Additionally, the codebook in the appendix describes the data-gathering process for its calculating. Moreover, chapter three also illustrates the need for standardization to ensure meaningful comparability. To this point, it is necessary to highlight that the standardization process's impact on the ratio's numerical value was unforeseen before making calculations in the research design stage. For example, negative values were not considered before standardizing all ratio values.

Thus, standardization produced negative values in the four cases in some years of each ratio. However, this must not be a concern given that once standardized, the direction of the value matters the most for comparison purposes. Therefore, it must be remembered that the comparison strategy is trend analysis. A downward trend is still considered positive, and an upward trend is still regarded as unfavorable regardless of negative ratio values. Finally, it must be remembered that according to the research design outlined in the

previous chapter, three periods (fiscal years) of sustained downward or upward is the central focus of the analysis.

There is another set of criteria to consider before analyzing the findings. Reliability (internal consistency) and measurement validity (external validity) are mainly considered for validating the measure, the Total Fiscal Effect Index. Both tests lead to the need to include correlation analysis; and, consequently, the inclusion of their tables in this chapter. For Babbie (2016), reliability asses "whether each of the items included in a composite measure makes an independent contribution or merely duplicates the contribution of other items in the same measure." Similarly, this author states that validity involves examining [a measure] relationship to other, presumed indicators of the same variable."

In more technical terms, Chen and Popovich (2002) assert that:

> Pearson's r becomes a useful index in practice to describe (1) the consistency between two responses derived from the same scale administered at two different times …, (2) the similarity between two responses derived from two similar measures (i.e., the correlation between the two similar measures, employed to gauge alternate-forms reliability), or (3) the persistence among responses toward items within a measure (e.g., the widely reported Cronbach coefficient alpha used to assess internal consistency reliability).

The third option, "the persistence among responses toward items within a measure," clearly refers to reliability. In addition to Pearson's r coefficient, it suggests using Cronbach coefficient alpha as also helpful to check on reliability. To this point, Nardo et al. (2008) add up that Cronbach Coefficient Alpha "assesses how well a set of items (in our terminology individual indicators) measures a single uni-dimensional object." These authors add that "C-alpha measures the portion of total variability of the sample of individual indicators due to the correlation of indicators. … If no correlation exists and

individual indicators are independent, then C-alpha is equal to zero, while if individual indicators are perfectly correlated, C-alpha is equal to one."

The second option Chen and Popovich (2002) mentioned, "the similarity between two responses derived from two similar measures," refers to the external validation of a measure or validity. These authors add that "[a] validity coefficient, often indexed by Pearson's r, reflects the degree of relatedness between inferences made about an event and the actual event." In other words, building an index must pass the test of correlating the index with related measurable phenomena, such as socio-economic and demographic variables.

Tax fiscal dimension caveat

Before jumping into the analysis of each city, a word of caution about the tax dimension is in order. The tax dimension has been troublesome since the beginning. For example, in chapter three, this dimension was expected to comprise only two fiscal rations: the Tax-to-Income Burden and the Tax Limit Exhausted. A two-ratios dimension instead of three was necessary because no other locally taxes related financial ratio was found in the extensive literature review searching for financial ratios. The Tax Limit Exhausted was proposed by the Office of the New York State Comptroller (2003). Although it comprises a numerator and a denominator like the other nine ratios, both resulted from complicated and time-consuming calculations narrowly tied to how New York localities produce, compile, report, and analyze its financial data.

For this reason, this ratio had to be dropped from the study. To remedy this inconvenience, Dr. Melinda James Lopez, an experienced scholar, and practitioner on local

public finance, was consulted. As a result, Dr. Lopez developed a ratio that would measure the extent to which a locality has exhausted its tax limit in Alabama cities, mirroring thus the financial ratio proposed by the Office of the New York State Comptroller. Two critical elements of this ratio were the Tax Lid (or tax cap) and the Total Millages Levied. The Tax Lid is set by Alabama law, and it is the same for all cities and has not exhibited change during the analysis. Localities set the latter, but none of the cities changed it during the analysis period. Therefore, this ratio would not have exhibited variation during the study of the four localities. Consequently, this ratio was also dropped from the calculations.

This eventuality implies that the resulting Total Fiscal Effect Index comprises three fiscal dimensions and the tax-to-income financial ratio. Thus, in disaggregating the index, when it comes to taxes, the only information available will be a sense of jurisdictions' ability to raise additional revenues and the level of taxation beyond which taxpayers are not willing to go. In other words, as a dependent variable, the index would fall short of fully reflecting the effect of using economic incentives over the tax dimension of localities. Therefore, developing an alternative ratio or pair of ratios to boost the understanding of the causal relationship between discretionary economic incentives and local taxes is still a necessity.

Research Findings Discussion

Auburn

The city of Auburn is the first locality to analyze through the lens of the T.F.E.I. Hence, as shown in Figure 4.1, from 2017 to 2020, there was a sustained decrement or a downward trend. This trend suggests the presence of a fiscal surplus, which is an outcome

contrary to a winner's course scenario. Therefore, an in-depth analysis by disaggregating the index is warranted. The index components show that from 2017 to 2018, although the tax-to-income burden ratio and the local debt dimension went slightly up, the local public revenue dimension went down. Thus, this decrement outweighs the two slight increments while the service level solvency remains almost constant. Therefore, scrutinizing the local public revenue dimension decrease is necessary by examining its financial ratios.

First, one must remember that a decrement in the index's value is desirable as it means fiscal surplus. For example, analyzing the revenue dimension table 4.1 shows that the index value went from 0.041 in 2017 to -0.170 in 2018. In turn, table 4.2 shows the change from 2017 to 2018 in each of the three ratios of this fiscal dimension. Table 4.2 shows that although the risk exposure factor slightly increased, the decrements in the own-source and intergovernmental ratios were far more significant than the increment in the risk exposure factor ratio. For a better understanding of the meaning of these changes for Auburn, Table 4.3 shows the raw value of the ratios, that is, without the standardization and weighting modifications.

Hence, looking at Table 4.3, the first fact that stands out is that not only the risk exposure factor ratio increased from 2017 to 2018 but also the own-source ratio. Nevertheless, it must be remembered that the own-source ratio was the only ratio that had to be modified to align its direction with the other ratios in the index (see Chapter 3, page 97). Thus, a value decrement of this ratio (looking at the index or dimension) is an increment in its raw value ratio. Therefore, the value change of the own-source ratio from 0.955 to 0.965 from 2017 to 2018 means that Auburn heavily relies on own-source revenues as it constitutes more than 95% of its total revenue. Secondly, it also means that

such reliance was further strengthened from 2017 to 2018. In short, one, some, or all the Auburn own-sources revenues increased (to see all revenue categories included as the numerator of this ratio, see the code book in the appendix section).

Simultaneously, according to Table 4.3, there was a decrease in the intergovernmental revenues ratio's raw value from 0.045 to 0.035 from 2017 to 2018. This change means Auburn has a small reliance (dependency) on state share taxes and grants; it also means that such inconsequential reliance on state share taxes and grants was further reduced from 2017 to 2018. Thus, thus far, an increase in the raw value of the own-source ratio and a decrement in the raw value of the ratio of the intergovernmental revenue are good signals of Auburn revenue solvency. However, Table 4.3 also shows an increment of the risk exposure factor ratio from 0.063 to 0.072 from 2017 to 2018.

This increment means that some non-own-sources revenues fell due to factors uncontrollable by Auburn and that using some of Auburn's own-revenue (most likely property taxes) is necessary to compensate for such shortfall. In other words, in 2017, a one percent shortfall in, for example, intergovernmental aid would require a 0.06 percent increase in, for example, property tax. Conversely, in 2018 a 0.07 percent would be necessary. As a result, the Auburn risk rose; however, this is inconsequential because such risk exposure factors remained very small from 2017 to 2018. Also, remember from the previous two ratios that Auburn dependency on revenues generated outside Auburn is also minimal. Therefore, Auburn would not be fiscally hurt in the case of an unexpected shortfall in its non-own-sources revenues.

Additionally, from 2018 to 2019, the Auburn T.F.E.I. exhibited a trivial reduction from -0.205 to -0.206. Since such a reduction is only -0.001, no analysis of this year's

change is required, yet it is relevant as it continues the downward trend. Nevertheless, 2019 to 2020 also showed a T.F.E.I. decrement from -0.206 to -0.536. This decrement shown in the Auburn T.F.E.I. is as significant as the one from 2017 to 2018. Therefore, it follows an in-depth analysis of the change from 2019 to 2020. Like from 2017 to 2018, the Auburn T.F.E.I. shows dimensions pulling in opposite directions. For example, Table 4.1 shows that the revenue and the debt dimensions exhibited increments; however, those increments were outweighed by the decreases in the service-level-solvency dimension and the tax-to-income burden ratio. Hence let us concentrate on these two components since they are the ones that pulled the direction of the Auburn T.F.E.I. downward.

Starting with the tax-to-income burden ratio, Table 4.2 shows that this ratio went down from -0.289 to -2.878 from 2019 to 2020. Since these numbers are the standardized values of this ratio, it is better to analyze the ratio raw value for a better grasp of the meaning of this change. Therefore, Table 4.3 shows how the raw value of this ratio decreased from 29.541 in 2019 to 24.793 in 2020. This change from 29.541 to 24.793 makes sense compared to the ratio mean of 30.071 (see Table 4.4). Thus, such a decrement can be considered an achievement. Hence, the decrement means Auburn's ability to raise additional revenue improved. Another interpretation is a relief of the fiscal pressure on taxpayers, and another implication is a lower financial risk should Auburn experience a sudden downturn. These explanations of the meaning of this ratio's decrease reflect that from 2019 to 2020, Auburn's major own-taxes collected increased while total personal income collected also increased.

Regarding the service-level-solvency fiscal dimension, Table 4.1 shows a decrease from 0.293 in 2019 to 0.196 in 2020. In turn, Table 4.2 shows the disaggregated

standardized value of each of the three constitutive ratios; as shown in this Table, all ratio values went down from 2019 to 2020. Yet again, to better understand the meaning of these changes, it is better to look at the raw ratio values exhibited in Table 4.3. Thus, the tax per capita ratio went from 1175.168 in 2019 to 1052.900 in 2020. At the same time, the revenue per capita ratio went down from 1939.223 in 2019 to 1751.684 in 2020. Such declines in these two ratios mean a relief on Auburn's residents' tax and revenue burden. On the other hand, the modest decrement in the expenses per capita ratio from 2129.326 in 2019 to 2119.833 in 2020 means a slight reduction in the cost of providing services to Auburn's residents.

Recalling from the discussion in chapter three, one of the flaws of the ratio analysis is that it does not tell us much without referencing or comparing it to a benchmark. Also, it must be recalled that the need for trend analysis is precisely to have such a benchmark by looking at change over time. While the trend of this dimension can be said to aid toward a fiscal surplus, comparing those ratios' values with the mean of each ratio is also necessary. Accordingly, Table 4.4 shows that each ratio's mean value is smaller than the final value of the three ratios in 2020. Therefore, the assessment of the findings for Auburn mentioned above leads us to conclude that although Auburn's ability to support a desirable level of services financially improved from 2019 to 2020, this ability has generally deteriorated during the analyzed period (from 2005 to 2020).

The following can be said to summarize the meaning of this downward trend shown by the Auburn T.F.E.I. identified from 2017 to 2020. First, from 2017 to 2018, Auburn strengthened its already high reliance on its own-sources to generate revenue which in turn means independence from outside-generated revenues, an independence that was further

strengthened. In short, Auburn revenue solvency was in excellent shape to the extent that a sudden decrease in the outside revenues, for reasons out of Auburn's control, would not hurt Auburn financially. Second, from 2018 to 2019, such good revenue solvency remained almost steady. Third, from 2019 to 2020, Auburn's ability to raise additional revenue improved since Auburn's ability to collect taxes increased along with its population income. Also, this was accompanied by an improvement of the local government to support a desirable level of services financially. In conclusion, Auburn got close to this dissertation definition of a fiscal surplus from 2017 to 2020.

Assuming that the identified downward trend for Auburn from 2017 to 2020 is, to some degree, the positive outcome of having granted a DEI package or packages a year or couple of years before 2017, then the natural question to ask is what was the causal mechanism that accounts for the positive effect? Unfortunately, answering this question requires performing the next research phase discussed in the following chapter (about the independent variable, taking the DEI expenditure as the catalyst or explanatory variable). Therefore, the subsequent analysis turns theoretically (as opposed to empirically) preliminary and constrained to the observations of the assumptions under which the analysis rest. For this reason, the following paragraph(s) must be taken cautiously.

Recalling from chapter two, the acknowledgment that the use of incentives can cause either a fiscal surplus or a fiscal deficit, it is possible to use the insights from chapter two to deliberate on the Auburn case. For example, the virtuous cycle of economic development, which starts with the DEI expenditure luring a firm(s), translates into new jobs, which also means new residents and fostering economic activity. In both cases, this means revenue gain in the form of taxes paid by the workers (income tax), their

consumption (sales taxes), taxes paid by the firm, and even property taxes as the new workers will buy a house, in short, a larger tax base. All these are considered own-source revenues, which Auburn increased from 2017 to 2018 and 2019 to 2020. Moreover, according to the virtuous cycle of economic development, increased revenue also translates into better public services. From 2019 to 2020, Auburn observed a better ability to support a desirable level of services according to the index's service-level solvency fiscal dimension. This fact also means that the city's capacity of existing infrastructure could absorb population growth without incurring an additional capital cost.

Auburn T.F.E.I. reliability and validity. Table 4.5 shows a mixed degree of association across ratios per dimension. For example, a strong, almost perfect correlation exists between the own-source and intergovernmental revenue ratios in the revenue dimension. In contrast, the correlation between the own-source ratio and the risk exposure factor ratio, and the intergovernmental revenue ratio are weak. Also, the correlation between the ratios of the debt dimension is moderate, ranging from 0.4 to 0.6. Finally, the correlation of the service-level solvency ratios looks more consistent, ranging from .5 to .9. However, the Cronbach Alpha for the Auburn T.F.E.I. is strong but negative. Regrettably, this suggests that one or more ratios must be dropped for the index or that something is wrong with the calculations.

A final indicator regarding reliability is the degree of associations across the three dimensions shown in Table 4.6. In this case, only the correlation between the debt and service-level solvency dimensions is strong; all other correlations are weak. Finally, for the validation of the Auburn T.F.E.I., Table 4.8 shows the correlation between the index and two socio-economic indicators (per Capita personal income and the unemployment rate)

and a demographic indicator (population). Once again, these results are mixed. Out of six correlation coefficients, three are weak, two are moderate, and only one is strong.

The Auburn T.F.E.I showed a positive trend (consecutive downward tendency from 2017 to 2020). However, reliability and validity tests showed mixed results, including a negative Cronbach alpha coefficient. For this reason, a methodological review of the index for Auburn is a mandate. Thus, no more profound analysis of the raw values and the meaning of those ratios from 2017 to 2020 is warranted.

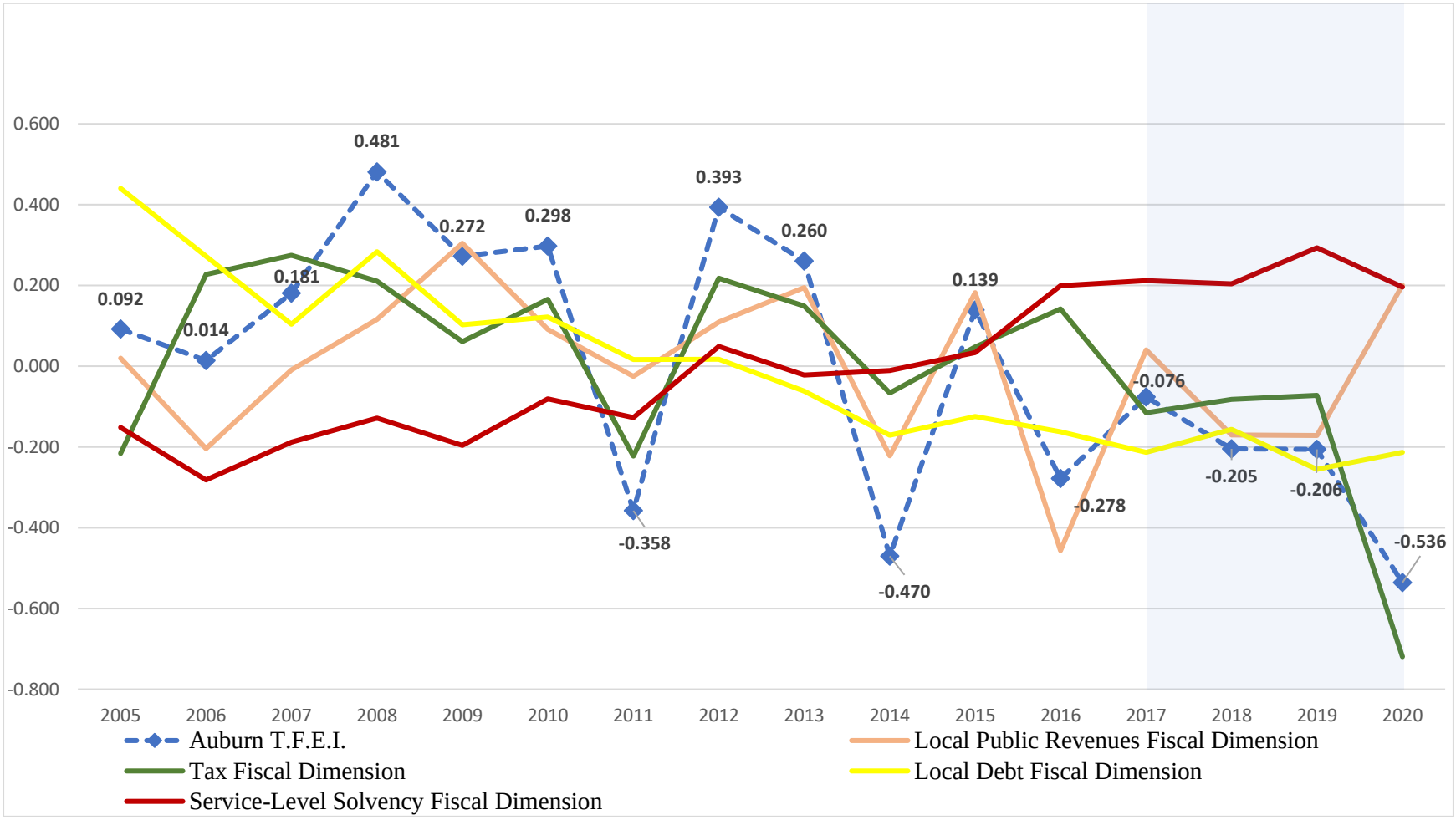

Figure 4.1. Line Graph of the Auburn Total Fiscal Effect Index and its Constitutive Fiscal Dimensions, 2005—2020

Table 4.1. Auburn Total Fiscal Effects Index (T.F.E.I.) and its Dimensions

Year	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension	Auburn T.F.E.I.
2005	0.020	-0.216	0.440	-0.152	0.092
2006	-0.204	0.227	0.272	-0.282	0.014
2007	-0.009	0.275	0.104	-0.188	0.181
2008	0.116	0.210	0.283	-0.128	0.481
2009	0.304	0.061	0.103	-0.196	0.272
2010	0.092	0.165	0.121	-0.081	0.298
2011	-0.025	-0.222	0.017	-0.127	-0.358
2012	0.109	0.218	0.017	0.049	0.393
2013	0.195	0.149	-0.062	-0.022	0.260
2014	-0.222	-0.066	-0.171	-0.011	-0.470
2015	0.182	0.047	-0.125	0.034	0.139
2016	-0.456	0.142	-0.162	0.199	-0.278
2017	0.041	-0.115	-0.213	0.212	-0.076
2018	-0.170	-0.082	-0.157	0.204	-0.205
2019	-0.171	-0.072	-0.256	0.293	-0.206
2020	0.201	-0.719	-0.213	0.196	-0.536

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.2. Auburn Financial Ratios (Standardized values)

Years	Local Public Revenues Fiscal Dimension				Local Debt Fiscal Dimension			Service-Level Solvency Fiscal Dimension		
	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-Assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	1.226	1.215	-0.433	-2.878	-0.910	-0.790	-0.857	0.816	1.028	1.091
2019	-0.493	-0.484	-0.737	-0.289	-1.200	-0.793	-1.073	1.495	1.779	1.123
2018	-0.538	-0.529	-0.634	-0.328	-0.513	-0.643	-0.725	1.194	1.211	0.656
2017	0.587	0.590	-0.771	-0.462	-0.282	-0.637	-1.642	0.964	0.983	1.230
2016	-1.817	-1.833	-0.914	0.566	-0.213	-0.441	-1.294	0.907	0.629	1.450
2015	0.792	0.792	0.237	0.190	-0.113	-0.446	-0.939	0.649	0.478	-0.617
2014	-0.698	-0.691	-0.832	-0.266	-1.460	-0.224	-0.369	0.401	0.242	-0.806
2013	1.312	1.298	-0.661	0.595	-0.621	-0.166	0.046	0.247	0.197	-0.770
2012	0.912	0.909	-0.728	0.871	-0.065	0.031	0.242	0.303	0.148	0.283
2011	0.261	0.268	-0.784	-0.890	-0.188	-0.037	0.426	-0.325	-0.356	-1.224
2010	0.753	0.753	-0.590	0.661	0.431	-0.043	1.069	-0.537	-0.538	-0.139
2009	0.876	0.874	1.291	0.244	0.470	0.028	0.736	-1.022	-0.928	-0.990
2008	0.084	0.093	0.981	0.841	-0.098	2.788	0.712	-1.019	-0.936	0.029
2007	-0.676	-0.668	1.251	1.098	0.508	-0.389	1.130	-1.084	-0.924	-0.817
2006	-1.768	-1.782	1.512	0.909	1.971	-0.339	1.637	-1.314	-1.336	-1.575
2005	-0.811	-0.805	1.812	-0.864	2.283	2.101	0.900	-1.676	-1.676	1.073

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.3. Auburn Financial Ratios

Years	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	0.949	0.051	0.086	24.793	0.696	0.142	0.239	1052.900	1751.684	2119.833
2019	0.965	0.035	0.065	29.541	0.671	0.141	0.212	1175.168	1939.223	2129.326
2018	0.965	0.035	0.072	29.469	0.729	0.156	0.256	1120.882	1797.280	1989.898
2017	0.955	0.045	0.063	29.224	0.748	0.156	0.139	1079.580	1740.400	2161.131
2016	0.978	0.022	0.053	31.110	0.754	0.175	0.183	1069.305	1651.906	2226.905
2015	0.953	0.047	0.131	30.419	0.762	0.175	0.229	1022.751	1614.179	1609.856
2014	0.967	0.033	0.059	29.584	0.650	0.196	0.302	978.161	1555.329	1553.384
2013	0.948	0.052	0.070	31.163	0.720	0.202	0.355	950.437	1543.967	1564.116
2012	0.952	0.048	0.066	31.668	0.766	0.220	0.380	960.539	1531.870	1878.509
2011	0.958	0.042	0.062	28.439	0.756	0.214	0.404	847.491	1405.732	1428.609
2010	0.953	0.047	0.075	31.284	0.808	0.213	0.487	809.352	1360.364	1752.515
2009	0.952	0.048	0.203	30.518	0.811	0.220	0.444	721.981	1262.856	1498.350
2008	0.959	0.041	0.182	31.613	0.763	0.485	0.441	722.545	1260.819	1802.740
2007	0.967	0.033	0.200	32.085	0.814	0.180	0.494	710.802	1263.953	1550.172
2006	0.978	0.022	0.218	31.738	0.936	0.185	0.559	669.376	1160.995	1323.630
2005	0.968	0.032	0.238	28.486	0.962	0.419	0.465	604.173	1076.041	2114.404

Source: Own creation based on data gathered from Auburn Comprehensive Annual Financial Report from 2005 to 2020.

Table 4.4. Auburn Financial Ratios Descriptive Statistics

Ratios	Mean	Median	Standard Deviation	Variance	Minimum	Maximum
Own-Source	0.960	0.959	0.00972[a]	0.000095[a]	0.948	0.978
Intergovernmental Revenues	0.040	0.041	0.009721[a]	0.000095[a]	0.022	0.052
Risk Exposure Factor	0.115	0.074	0.068	0.004597	0.053	0.238
Tax-to-Income Burden	$30.071	$30.469	$1.834	$3.364	$24.793	$32.085
Liabilities-to-assets	0.772	0.759	0.083	0.006961[a]	0.650	0.962
Debt Service Burden	0.217	0.190	0.096	0.009188[a]	0.141	0.485
Available Legal Debt Limit	0.349	0.368	0.128	0.016	0.139	0.559
Tax per Capita	$905.965	$955.488	$180.049	$32,417.782	$604.173	$1,175.168
Revenue per Capita	$1,494.787	$1,537.918	$249.844	$62,421.959	$1,076.041	$1,939.223
Expenses per Capita	$1,793.961	$1,777.628	$298.558	$89,136.581	$1,323.630	$2,226.905

Source: Own creation based on data from Table 4.1; n = 16

[a] small value to be presented in three decimal digits

Table 4.5. Auburn Correlation Matrix across Financial Ratios per each Dimension

Revenues Fiscal Dimension	Own-Source	Intergovernmental Revenues	Risk Exposure Factor
Own-Source	-	-	-
Intergovernmental Revenues	0.999**	-	-
Risk Exposure Factor	-0.254**	-0.253**	-
Debt Fiscal Dimension	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit
Liabilities-to-assets	-	-	-
Debt Service Burden	0.427**	-	-
Available Legal Debt Limit	0.686**	0.463**	-
Service-Level Solvency Fiscal Dimension	Tax per Capita	Revenue per Capita	Expenses per Capita
Tax per Capita	-	-	-
Revenue per Capita	0.989**	-	-
Expenses per Capita	0.509**	0.527**	-

***p <.01 Significant Level*

Cronbach Coefficient Alpha = -0.962

Table 4.6. Auburn Correlation Matrix across Fiscal Dimension

	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden Ratio	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension
Local Public Revenues Fiscal Dimension	-	-	-	-
Tax-to-Income Burden Ratio	-0.134**	-	-	-
Local Debt Fiscal Dimension	0.202**	0.340**	-	-
Service-Level Solvency Fiscal Dimension	-0.265**	-0.410**	-0.834**	-

***p <.01* Significant Level

Table 4.7. Validity Test Data for the Auburn T.F.E.I.

Year	Auburn T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
2020	-0.536	$42,468.00	5.4%	76,143
2019	-0.206	$39,781.00	2.9%	66,259
2018	-0.205	$38,036.00	3.5%	65,378
2017	-0.076	$36,941.00	4.9%	63,973
2016	-0.278	$34,372.00	4.9%	63,118
2015	0.139	$33,622.00	4.9%	62,059
2014	-0.470	$33,064.00	4.9%	60,258
2013	0.260	$30,499.00	4.9%	58,582
2012	0.393	$30,332.00	6.9%	57,058
2011	-0.358	$29,800.00	7.5%	54,927
2010	0.298	$28,838.00	7.7%	53,780
2009	0.272	$28,339.00	7.8%	57,828
2008	0.481	$29,013.00	4.1%	56,287
2007	0.181	$27,874.00	2.8%	55,652
2006	0.014	$23,632.00	2.8%	54,505
2005	0.092	$23,632.00	3%	53,004

Source: Own creation based on data gathered from Auburn Comprehensive Annual Financial Report from 2005 to 2020.

Table 4.8. Auburn Correlation Matrix for the T.F.E.I., Socio-economic and Demographic Variables

	Auburn T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
Auburn T.F.E.I.	-	-	-	-
Per Capita Personal Income	-0.589**	-	-	-
Unemployment Rate	0.113**	-0.019**	-	-
Population	-0.613**	0.936**	-0.112**	-

***p <.01* Significant Level

Montgomery

Montgomery is the second city to be analyzed through the lens of the T.F.E.I. A simple visual examination of Figure 4.2 reveals a clear upward trend from 2012 to 2016. In fact, the Montgomery T.F.E.I. index line has a general upward tendency dimmed for two downward periods from 2010 to 2012 and from 2016 to 2018. However, the upward trends from 2012 to 2016 and 2018 to 2020 outweigh the two downward trends. Four years of a sustained increment (from 2012 to 2016) suggest the presence of a winner's course scenario.

The first thing to notice from Figure 4.2 and Table 4.9 is that the local public revenue fiscal dimension increased while the tax-to-income burden decreased from 2012 to 2014; conversely, from 2014 to 2016, this tendency was reversed. In other words, from 2014 to 2016, the local public revenue fiscal dimension decreased while the tax-to-income burden increased. Therefore, because this fiscal dimension and this fiscal ratio moved simultaneously in opposite directions, numerically speaking, it can be said that they canceled out each other. Consequently, the analysis of Montgomery's T.F.E.I. will concentrate on the two fiscal dimensions that showed sustained increments over more than three consecutive years. This omission does not mean these variations are irrelevant or inconsequential. It only means that the local public revenue fiscal dimension and the tax-to-income burden ratio will not be analyzed because the direction of their variations was not sustained for three or more years.

Table 4.9 shows that the local debt and service-level fiscal dimensions show sustained increments from 2012 to 2016. Focusing first on the debt dimension, Table 4.10 shows that from the three debt ratios, only the liabilities-to-assets ratio maintained the

increment throughout the four years from 2012 to 2016. The debt service burned ratio increased from 2012 to 2015 and decreased from 2015 to 2016. Finally, the available legal debt limit ratio showed erratic behavior, increased from 2012 to 2013, decreased from 2013 to 2014, decreased from 2014 to 2015, and increased from 2015 to 2016. Worth noticing is that this last incremental change was more significant than all previous changes.

Consequently, the sustained increment in the liabilities-to-assets ratio is the easiest to interpret. Although, for a better interpretation, Table 4.11 displays the ratio's raw values, which in 2012 was 0.913, and every other year increased until reaching 1.661 in 2016. There are three related ways to interpret these numbers. First, Montgomery seems to be financing the acquisition of its assets with debt during these four years. Second, most likely, this is happening through borrowing and other long-term obligations. Third, Mead (2018) provides a benchmark for this ratio, stating that no more than half of the city's assets should be financed with debt. Thus, less than point five is acceptable, while greater than point five would threaten Montgomery's ability to fulfill its obligations.

This last point seems alarming because, in 2012 and 2013, Montgomery was on the path to reaching the level where its debt would surpass the value of its assets. Regrettably, in 2014 Montgomery reached this point with a ratio value of 1.055. From there, it continued increasing till reaching 1.661 in 2016, more than three times the recommended level for healthy public finances. However, Table 4.12 reveals that the minimum value for this ratio is 0.779, while its mean is 1.473. In other words, during the decade represented by the index, Montgomery's liabilities-to-asses situation was already undesirable, and by 2016, it had deteriorated moderately compared to its mean value.

Regarding Montgomery's debt service burden ratio, Table 4.11 shows that from 2012 to 2015, this ratio increased its value and decreased from 2015 to 2016. However, to understand the meaning of this ratio values, it must be remembered that this ratio indicates how much of each dollar of the government's revenue is spent on debt service. Therefore, in 2012 Montgomery spent slightly more than a cent on principal, interest, and debt issue cost (see the code book) payments for every dollar collected in revenue, as indicated by the ratio value of 0.103. This value increased for three consecutive years, and in 2015, it grew to 0.193, which means that Montgomery almost doubled its debt service payment, slightly less than 2 cents for every dollar collected. Such an increase is undoubtedly undesirable. Table 4.12 reveals that 2012 was the minimum value for this ratio during the whole index period, and it surpassed its mean of 0.140; in fact, it got close to its maximum value of 0.219 observed in 2020.

To finalize the analysis of the debt dimension, Table 4.11 shows an increment of the available legal debt limit ratio from 2012 to 2014 from 0.453 to 0.462. This increment was followed by a decrement in 2015 to 0.446, then increased again in 2016 to 0.6.12. This ratio measures the government's capacity to issue general bond debt. It, therefore, helps to answer whether the government can issue more long-term general bonded debt if needed. Consequently, it can be asserted that from 2012 to 2014, Montgomery was gradually less able to issue more long-term general bonded debt; it slightly recovered such capacity in 2015 and then deteriorated again in 2016. The situation was not so bad in the first three years, from 2012 to 2015; it only moved slightly from the mean ratio value of 0.474, according to Table 4.12. However, the situation in 2016 was detrimental because it reached

the maximum value of 0.612 for the whole period represented by the index, according to Table 4.12.

Concerning the service-level fiscal dimension, Table 4.9 shows four years of sustained increment from 2012 to 2016. However, Table 4.10 shows that whereas the tax per capita and the revenue per capita ratios maintained the increment throughout those four years, the expenses per capita ratio showed erratic behavior. Table 4.11 shows the raw ratio values for these three financial ratios. For example, Table 4.11. shows the value of the tax per capita ratio starting at 680.821 in 2012, which uninterruptedly increased to 768.478 in 2016. This increment can be interpreted as a higher tax burden for residents, translating into lower service-level solvency. In other words, the increment of the taxes that Montgomery collected from its residents is greater than the increment of the population; put simply, Montgomery residents were paying more taxes in 2016 than in 2012.

The revenue per capita financial ratio reinforces the above discussion and, therefore, the conclusion about Montgomery residents being worse off in 2016 than in 2014. This statement is because an interrupted increment of this financial ratio during these four years suggests a higher revenue burden for Montgomery residents to pay for government-provided services, in short, lower service-level solvency. For example, Table 4.11 shows that in 2012, the ratio value was 1159.318, then uninterruptedly increased to 1291.720 in 2016. Simply put, the increased collected revenue exceeded the population growth in 2016 in comparison to 2012 in Montgomery.

The expenses per capita ratio is the third and last service-level solvency dimension ratio, assessing the cost of providing services to local government residents. For Montgomery, from 2012 to 2016, this ratio showed opposing changes almost in a circular

way in the sense that 2016 ended up being nearly the same as in 2012. Hence, according to Table 4.11, this ratio value increased from 2012 to 2014, decreased from 2014 to 2015, and increased again from 2015 to 2016. The bottom line is that in 2012 the ratio value was 1297.483, and in 2016 was 1297.143. In other words, while the cost of providing a certain level of services has changed during the period of interest (2012 to 2016), Montgomery's governmental authorities managed to avoid these changes to translate into a more expensive government and lower service-level solvency.

In conclusion, Montgomery's period of interest goes from 2012 to 2016. Also, the analysis overlooks the changes in the local public revenue fiscal dimension and the tax-to-income burden ratio, given that they changed in opposite directions, and, in a sense, they cancel out each other. Hence the analysis of what the Montgomery T.F.E.I. reveals concentrates on the local debt and service-level fiscal dimensions. Disaggregating these two dimensions and starting with the debt dimension, the liabilities-to-assets ratio shows that Montgomery was uninterruptedly financing the acquisition of its assets with debt. Montgomery's debt service burden ratio indicates that from 2013 to 2015, the city almost doubled its debt service payment to slightly less than 2 cents for every dollar collected. Moreover, Montgomery was gradually less able to issue more long-term general bonded debt; it slightly recovered such capacity in 2015 and then deteriorated again in 2016.

Concerning the service-level fiscal dimension, the tax per capita ratio shows that Montgomery collected an increased amount of taxes from its residents, and this increment was superior to the increment of the population; put simply, Montgomery residents were paying more taxes in 2016 than in 2012. Moreover, the revenue per capita ratio changes suggest a higher revenue burden for Montgomery residents to pay for government-provided

services. In other words, the increased collected revenue exceeded the population growth in 2016 compared to 2012. Finally, while the cost of providing a certain level of services was erratically changing from (2012 to 2016), Montgomery's governmental authorities managed to avoid these changes to translate into a more expensive government and lower service-level solvency.

Logically follows the questions, how the above discussion can be explained due to changes in the DEI expenditure a year or a couple of years before 2012? The first point is that the identified trend is a fiscal deficit or a winner's curse outcome. First, assuming a causal relationship between incentives and the Montgomery T.F.E.I., then the harmful cycle of economic development (chapter 2, pages 68 and 69) can help explain these results. Accordingly, If a DEI package costs more than what they generate, the local government must compensate for the revenue shortfall caused by the incentive by reducing services or increasing taxes on existing residents and businesses. Thus, concentrating first on the revenue shortfall, the discussion starts analyzing the negative consequences of incentives over capital expenditures.

Direct revenue losses will negatively impact the local government's spending capacity on fixed assets (capital improvement). Therefore, to continue raising capital for development finance programs, to finance infrastructure projects for economic activity and local quality of life, and to supply capital at below-market interest rates, local governments must incur debt. Thus, since a direct look at the revenue situation is being overlooked, the debt fiscal dimension is another indicator of the negative impact of incentives when granting them in excess. As discussed above, Montgomery's debt financial ratios tell a tale

of a city with sustained increased debt levels or a deteriorated capacity to finance capital improvement using general obligation bonds.

Additionally, continuing with the direct revenue losses, B'' (in the total fiscal effects equations) being higher than B' (direct revenue gains), the harmful cycle of economic development explains that a decline in the tax revenue leads to a reduction in the public services. Hence Montgomery's financial ratios of the service level dimension collectively uncover the deterioration of Montgomery's overall service-level solvency as predicted by the harmful cycle of economic development.

Montgomery T.F.E.I. reliability and validity. Table 4.13 shows the correlation between each financial ratio per dimension. Unlike Auburn, Montgomery exhibits a consistent set of correlations ranging from moderate (around 0.5) to strong (bigger than 0.6 but smaller than 0.9), with the only exception of the correlation between the debt service burden ratio and the available legal debt limit ration both of which belong to the debt dimension of the Montgomery T.F.E.I. The Cronbach alpha coefficient equals 0.871, indicating that the Montgomery T.F.E.I. has successfully passed the reliability test. Finally, Table 4.14 shows a set of mixed correlations across dimensions, where half can be considered low, and the other half can be high or strong. Thus, the revenue dimension seems weakly correlated with the tax-to-income burden ratio, the debt dimension, and the service-level solvency dimension. However, the tax-to-income burden ratio seems strongly correlated with the debt and service-level solvency dimensions. Finally, there is a strong correlation between debt and the service-level solvency dimensions.

Regarding the validity test, Table 4.16 also offers a solid set of correlations where half can be considered moderate and the other half strong. The most crucial set of

correlations is between the Montgomery T.F.E.I. and the per capita personal income (0.918), unemployment rate (-0.492), and population (-0.684). Those three correlations are strong and moderated, respectively, but no signal of a weak correlation among them. Consequently, it can be concluded that the Montgomery T.F.E.I. has also successfully passed the validity test. Therefore, the Montgomery T.F.E.I. is a good dependent variable for analyzing the causal relationship between discretionary economic incentives and the long-term fiscal consequences for two reasons. First, the Montgomery case exhibits a warning trend of five years of fiscal deterioration, and second, the index has passed both reliability and validity tests.

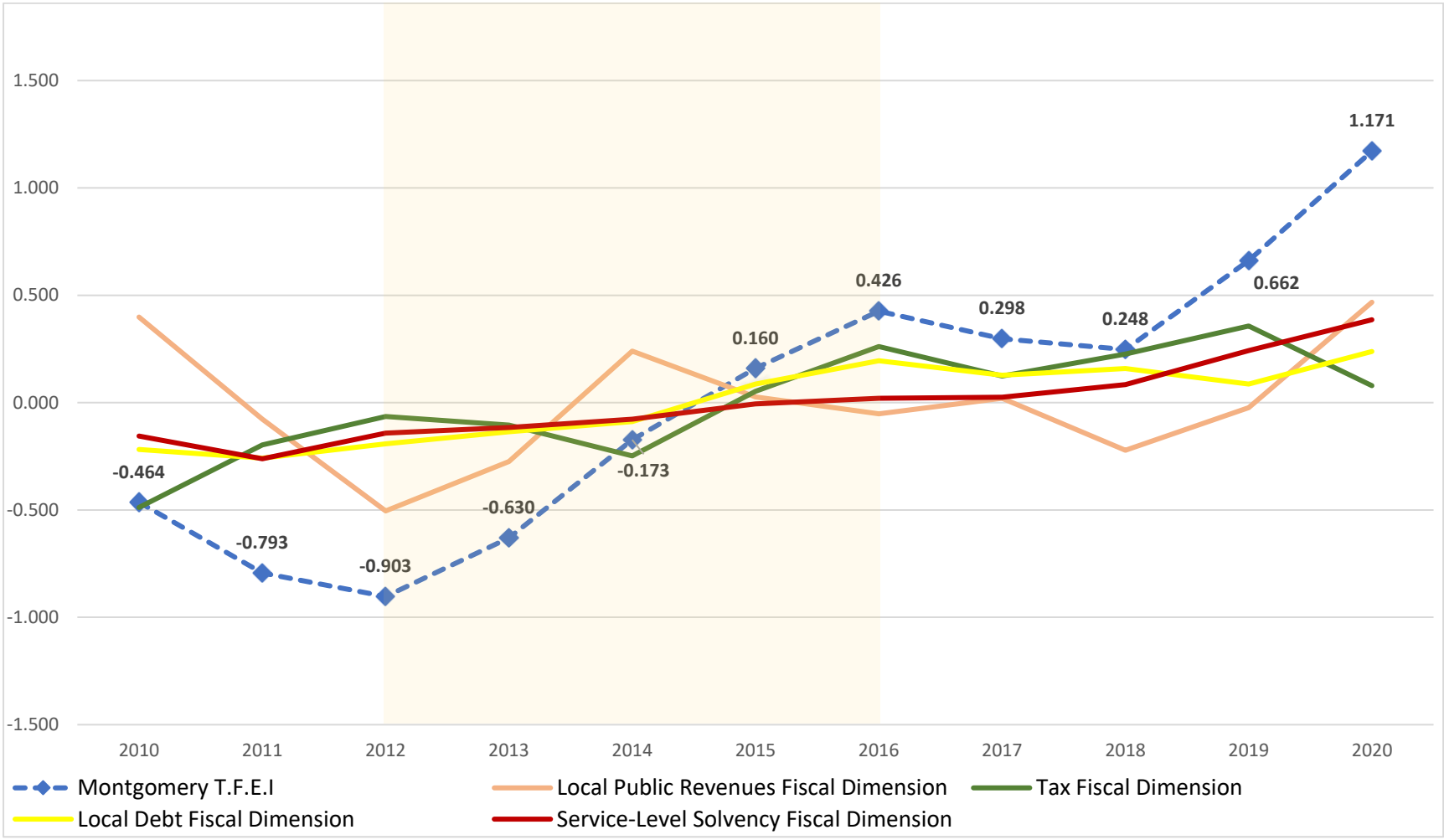

Figure 4.2. Line Graph of the Montgomery Total Fiscal Effect Index and its Constitutive Fiscal Dimensions, 2010—2020

Table 4.9. Montgomery Total Fiscal Effects Index (T.F.E.I.) and its Dimensions

Year	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension	Montgomery T.F.E.I.
2010	0.398	-0.488	-0.218	-0.156	-0.464
2011	-0.077	-0.197	-0.259	-0.262	-0.793
2012	-0.504	-0.065	-0.192	-0.142	-0.903
2013	-0.274	-0.104	-0.136	-0.116	-0.630
2014	0.240	-0.247	-0.088	-0.077	-0.173
2015	0.026	0.053	0.087	-0.006	0.160
2016	-0.052	0.262	0.195	0.021	0.426
2017	0.021	0.124	0.127	0.026	0.298
2018	-0.222	0.227	0.159	0.084	0.248
2019	-0.024	0.357	0.086	0.242	0.662
2020	0.468	0.079	0.238	0.386	1.171

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.10. Montgomery Financial Ratios (Standardized)

Years	Local Public Revenues Fiscal Dimension				Local Debt Fiscal Dimension			Service-Level Solvency Fiscal Dimension		
	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-Assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	1.650	1.630	1.395	0.317	1.214	2.238	-0.594	1.443	1.593	2.754
2019	-0.229	-0.215	0.209	1.427	1.436	-0.345	-0.055	1.546	1.413	0.670
2018	-1.112	-1.124	0.018	0.906	1.323	0.066	0.516	0.837	0.465	-0.035
2017	0.001	0.016	0.188	0.496	0.379	-0.150	1.300	0.485	0.433	-0.534
2016	-0.182	-0.168	-0.172	1.047	0.315	-0.136	2.163	0.210	0.351	-0.248
2015	-0.096	-0.081	0.441	0.211	-0.011	1.497	-0.444	-0.039	0.033	-0.087
2014	1.106	1.107	0.190	-0.990	-0.701	-0.172	-0.190	-0.481	-0.102	-0.578
2013	-0.988	-0.995	-0.757	-0.416	-0.821	-0.754	-0.059	-0.589	-0.634	-0.513
2012	-1.334	-1.358	-2.352	-0.259	-0.937	-1.039	-0.329	-0.925	-0.961	-0.243
2011	-0.204	-0.190	-0.371	-0.787	-1.037	-0.903	-1.163	-1.331	-1.644	-0.948
2010	1.388	1.379	1.213	-1.953	-1.162	-0.303	-1.145	-1.157	-0.948	-0.237

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.11. Montgomery Financial Ratios

Years	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	0.865	0.135	0.383	0.030	2.198	0.219	0.436	863.688	1416.983	1515.642
2019	0.893	0.107	0.337	0.031	2.330	0.128	0.470	871.631	1398.855	1363.977
2018	0.907	0.093	0.329	0.030	2.262	0.142	0.507	816.857	1303.195	1312.618
2017	0.889	0.111	0.336	0.030	1.699	0.135	0.557	789.678	1299.963	1276.294
2016	0.892	0.108	0.322	0.031	1.661	0.135	0.612	768.478	1291.720	1297.143
2015	0.891	0.109	0.346	0.030	1.466	0.193	0.446	749.208	1259.631	1308.868
2014	0.873	0.127	0.336	0.029	1.055	0.134	0.462	715.078	1245.982	1273.137
2013	0.905	0.095	0.299	0.029	0.983	0.113	0.470	706.779	1192.329	1277.861
2012	0.910	0.090	0.236	0.029	0.913	0.103	0.453	680.821	1159.318	1297.483
2011	0.892	0.108	0.314	0.029	0.854	0.108	0.400	649.440	1090.442	1246.219
2010	0.868	0.132	0.376	0.028	0.779	0.129	0.401	662.904	1160.685	1297.921

Source: Own creation based on data gathered from Montgomery Comprehensive Annual Financial Report from 2010 to 2020.

Table 4.12. Montgomery Financial Ratios Descriptive Statistics

Ratios	Mean	Median	Standard Deviation	Variance	Minimum	Maximum
Own-Source	0.890	0.892	0.015	0.00023266[a]	0.865	0.910
Intergovernmental Revenues	0.110	0.108	0.015	0.00023266[a]	0.090	0.135
Risk Exposure Factor	0.328	0.336	0.039	0.00153939[a]	0.236	0.383
Tax-to-Income Burden	$0.030	$0.030	$ 0.00097[a]	0.00000095[a]	$0.028	$0.031
Liabilities-to-assets	1.473	1.466	0.597	0.356	0.779	2.330
Debt Service Burden	0.140	0.134	0.035	0.00125924[a]	0.103	0.219
Available Legal Debt Limit	0.474	0.462	0.064	0.00405492[a]	0.400	0.612
Tax per Capita	$ 752.233	$ 749.208	$ 77.215	$ 5,962.169	$ 649.440	$ 871.631
Revenue per Capita	$ 1,256.282	$ 1,259.631	$ 100.880	$ 10,176.779	$ 1,090.442	$ 1,416.983
Expenses per Capita	$ 1,315.197	$ 1,297.483	$ 72.785	$ 5,297.706	$ 1,246.219	$ 1,515.642

Source: Own creation based on data from Table 4.1; $n = 11$

[a] small value to be presented in three decimal digits

Table 4.13. Montgomery Correlation Matrix across Financial Ratios per each Dimension

Revenues Fiscal Dimension	Own-Source	Intergovernmental Revenues	Risk Exposure Factor
Own-Source	-	-	-
Intergovernmental Revenues	0.999**	-	-
Risk Exposure Factor	0.808**	0.811**	-
Debt Fiscal Dimension	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit
Liabilities-to-assets	-	-	-
Debt Service Burden	0.520**	-	-
Available Legal Debt Limit	0.409**	-0.061**	-
Service-Level Solvency Fiscal Dimension	Tax per Capita	Revenue per Capita	Expenses per Capita
Tax per Capita	-	-	-
Revenue per Capita	0.975**	-	-
Expenses per Capita	0.702**	0.740**	-

***p <.01 Significant Level*

Cronbach Coefficient Alpha = 0.871

Table 4.14. Montgomery Correlation Matrix across Fiscal Dimension

	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden Ratio	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension
Local Public Revenues Fiscal Dimension	-	-	-	-
Tax-to-Income Burden Ratio	-0.291**	-	-	-
Local Debt Fiscal Dimension	0.221**	0.800**	-	-
Service-Level Solvency Fiscal Dimension	0.370**	0.670**	0.841**	-

***p <.01 Significant Level*

Table 4.15 Validity Test Data for the Montgomery T.F.E.I.

Year	Montgomery T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
2020	1.171	$28191	8.6%	200603
2019	0.662	$27172	2.6%	198525
2018	0.248	$25849	3.5%	198218
2017	0.298	$25488	3.6%	199525
2016	0.426	$24430	5.7%	200024
2015	0.160	$24537	6%	200586
2014	-0.173	$24365	6.6%	200486
2013	-0.630	$23721	7.1%	201335
2012	-0.903	$23176	7.9%	205285
2011	-0.793	$23363	10%	213132
2010	-0.464	$23968	9.2%	205764

Source: Own creation based on data gathered from Montgomery Comprehensive Annual Financial Report from 2010 to 2020.

Table 4.16. Montgomery Correlation Matrix for the T.F.E.I., Socio-economic and Demographic Variables

	Montgomery T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
Montgomery T.F.E.I.	-	-	-	-
Per Capita Personal Income	0.918**	-	-	-
Unemployment Rate	-0.492**	-0.436**	-	-
Population	-0.684**	-0.584**	0.791**	-

***p <.01* Significant Level

Huntsville

Huntsville is the third city for which a T.F.E.I. was built. In this case, Figure 4.3 shows two upward trends from 2011 to 2016 and then from 2017 to 2020. Recalling that an upward trend is considered a negative signal for local finances as measured by the index. For the Huntsville case, from 2011 to 2016, meet the timeframe required to be considered a trend, a warning signal. The second upward trend goes from 2017 and 2020; it also meets the timescale necessary to suspect a potential presence of a winner's curse scenario.

The first period of interest shows five years of the T.F.E.I. sustained increment from 2011 to 2016. The first fact to comment on is that, as in the case of Auburn and Montgomery, there seems to be a robust negative correlation between the local public revenue fiscal dimension and the tax-to-income burden. Regarding the T.F.E.I. line graph, this negative correlation can be observed as opposing almost symmetrical lines. Such patterns were overlooked in the Auburn and Montgomery case because it was not very noticeable visually since the distance between both lines is relatively narrow. However, this pattern is visually evident in the case of Huntsville, given that distance between both lines is considerably greater compared to the spaces between the public revenue dimension line and the tax-to-income burden line for Auburn and Montgomery.

One way to know if this is purely coincidental or a fact worth scrutiny is by looking at the correlation matrix tables built to test the indexes' reliability. Hence, for Auburn, Table 4.6 shows the correlation across the three dimensions and the ratio where the correlation coefficient for the revenue dimension and the tax-to-income ratio was -0.134. For Montgomery, Table 4.14 shows that the same correlation coefficient was -0.291, while for Huntsville, Table 4.22 show the same coefficient value of -0.608. This coefficient

reveals that the local public revenue dimension and the tax-to-income burden ratio are inversely correlated; however, such correlation increases (taking the absolute value) as the distance between the two lines grows.

This curious fact deserves further examination; however, the focus here is trends or movements in the same direction for three or more years. Thus, although the Huntsville local public revenue dimension and the tax-to-income ratio show an inverse trend from 2013 to 2016, the focus here will be on the tendency displayed by the local debt fiscal dimension and the service-level fiscal dimension. This omission is purely practical and hierarchical, a practical omission because the primary goal of this chapter is not a thorough examination of every index's component but to make a case for the index's suitability as a multi-dimensional independent variable.

The three years increment from 2013 to 2016 in the tax-to-income burden ratio can indicate a fiscal deficit. On the other hand, three years decrement during the same years in the local public revenue dimension indicates a fiscal surplus. However, given their robust negative correlation (-0.608), when it comes to their contribution to the index value, they virtually cancel out each other, another reason for their practical omission in the analysis. Moreover, five years of sustained increment in the local debt fiscal dimension and the service-level solvency fiscal dimension takes analytical precedence over a three-year trend of the local public revenue dimension and the tax-to-income burden ratio, a matter of omission based on hierarchy or importance.

Thus, starting with the local debt fiscal dimension, Table 4.17 shows that this dimension grew continuously but modestly from 2011 to 2016, beginning at -0.182 and ending at 0.056, respectively. Such a trend indicates Huntsville is incurring more debt to

spend on fixed assets. However, disaggregating this dimension in its three ratios can help better understand Huntsville's debt situation. The first ratio is the liabilities-to-assets, which only showed a minor decrement from 2012 (-0.725) to 2013 (-0.835); in all other years, the value of this ratio increased, reaching a ratio value of 1.051 in 2016. To better interpret this trend, it is necessary to look at the raw values of this ratio in Table 4.19.

Hence, the first point to notice is that from 2011 to 2014, the value of this ratio was less than point five, while in 2015 and 2016 was 0.596 and 0.611, respectively. Remembering that according to Mead (2018), less than point five is an acceptable value for this ratio, and conversely, above point five is not a good signal. This rule of thumb is because no more than half of the city's assets should be financed with debt. Therefore, it can be concluded that before 2014 Huntsville's debt situation was in good shape but in a deteriorating trend to the extent that in 2015 surpassed what it is considered an acceptable level and started financing more than half of its assets acquisitions with debt.

The debt service burden ratio is the second ratio of this fiscal dimension to analyze. For example, Table 4.18 shows how this ratio has a very erratic behavior from 2011 to 2016, so erratics (two increments, one decrement that outweighs the first to changes, then another decrement, and finally an increase) that it is only practical to compare 2011 with 2016. Hence at the starting point of this period of interest, the standardized ratio value was -0.176, and it ended at -0.717, an evident decrement. Yet again, it must be recalled that given the mechanics of the index, a decrement is desirable.

For a better interpretation, however, Table 4.19 shows the raw value of the ratio. Thus, in 2011 the ratio value was 0.185, while in 2016 was 0.144; it must be remembered that this ratio indicates how much of each dollar of the government's revenue is spent on

debt service. Consequently, in 2016 Huntsville devoted slightly less than fifteen cents on principal, interest, fiscal charges, and debt issue cost (see the code book) payments for every dollar collected in revenue. Therefore, this debt service burden is an improvement compared to 2011, when it paid slightly more than eighteen cents, as indicated by the ratio value of 0.185.

The third financial ratio of this dimension is the available legal debt limit. Thus, Table 4.18 shows how this ratio has a very erratic behavior from 2011 to 2016 (increment, decrement, increment, decrement, and increment, each one bigger than the previous one). But, in general, comparing the starting year of 2011 with the ending year of 2016, it can be affirmed that the trend is upward. It is worth noticing that each incremental change outweighed the previous one, and therefore the last variation from 2015 to 2016 was almost a point and a half in absolute value. Consulting Table 4.19 can aid in making sense of these variations in this ratio. Thus, this ratio's raw value in 2011 was 0.518; in 2015, it had decreased to 0.499, and then in 2016 increased to 0.624. The bottom line is that by 2016 this ratio value had increased, and this increment can be interpreted as Huntsville declining its ability to issue more long-term general bonded debt.

Regarding Huntsville's service-level solvency fiscal dimension, Table 4.17 show that from 2011 to 2016, Huntsville's ability to provide a desirable level of services to its residents deteriorated. For example, in 2011, Huntsville's service-level solvency fiscal dimension value was -0.182; after five years of sustained increment, it reached a value of 0.097 in 2016. Although this was not a substantial increase, the fact that it was interrupted warrants a backward examination by disaggregating the index. Hence, Table 4.18 shows the standardized values of its three constitutive ratios. Starting with the tax per capita ratio,

Table 4.18 shows how this ratio decreased from -0.634 in 2011 to -0.694 in 2013. However, such decrement was outweighed by the later increments in 2014 (-0.087), 2015 (0.367), and 2016 (0.669). Thus, this means a higher tax burden for Huntsville's residents. For example, Table 4.23 shows that the population of Huntsville was 182,319 in 2011 and in 2016 was 193,079. On the other hand, Table 4.19 show the raw value of the Huntsville tax per capita ratio of 1,234.803 in 2011, while in 2016 was 1,521.578. Therefore, it can be concluded that the increase in the tax collected from Huntsville residents was greater than its population increase.

Regarding Huntsville's revenue per capita ratio, Table 4.18 shows a continual increment from -0.759 in 2011 to 0.771 in 2016. Table 4.19 shows this ratio's raw value of 1,617.544 in 2011; five years later, in 2020, it was 2,000.033. These numbers mean that Huntsville's residents are contributing more to the public coffers, a higher revenue burden for them. Yet again, remember that Huntsville's population, which is this ratio's denominator, was 182,319 in 2011 and 193,079 in 2016. Given that the ratio value increased in those five years, the only mathematical explanation is that the numerator did not only grow, but this increase was bigger than the population increment. Looking at Huntsville's data source in the codebook in the appendix, jointly, the following revenue categories are represented by the numerator of this ratio: sales and use taxes, property taxes, other taxes, licenses and permits, fines and forfeitures, revenues from money and property, charges for services, intergovernmental, gifts and donations, and other revenues. The ratio, however, only speaks for their collectivity.

Finally, the expenses per capita ratio history is not so different from the previous analysis of this ratio for Auburn and Montgomery in that the changes were erratic and

modest, which is minor and highly variant. For example, as shown in Table 4.18, there was an increase from 2011 to 2012, then a decrease from 2012 to 2013, then another increase (the most significant change) from 2013 to 2014, followed by two declines from 2014 to 2015 and 2016. Such erratic changes can be troublesome to analyze; however, if the initial and the final years of the period of interest are evaluated, a moderated increase in this ratio means a more expensive government.

To elaborate on this statement, Table 4.19 shows the raw value of this ratio; in the initial year, 2011, the ratio value was 1,754.265, while in the final year, 2016 was 2,089.249. Yet again, given that the Huntsville population increased during those years, and because the ratio value also increased, it can be concluded that the numerator, total expenses, also raised more than the population growth. In short, during those years, Huntsville's ability to support a desirable level of services slightly deteriorated. Hence, Huntsville's ability to provide and pay for services necessary for its residents' general well-being was compromised somewhat.

Omitting the contrasting variations in the local public revenues fiscal dimension with the tax-to-income burden and focusing on the local debt fiscal dimension and the service-level solvency fiscal dimension, it can be concluded that Huntsville's T.F.E.I. reveals the following information. First, regarding its debt situation, before 2014, Huntsville's liabilities-to-assets situation was in good shape but in a deteriorating trend to the extent that in 2015 surpassed what it is considered an acceptable level and started financing more than half of its asset acquisitions with debt. On the other hand, compared with previous years, the city improved its debt service burden in 2016. For example, in 2011, Huntsville was devoting slightly more than 18 cents versus a bit less than fifteen

cents in 2016. Nonetheless, by 2016 Huntsville declined its ability to issue more long-term general bonded debt. Regarding Huntsville's service-level solvency fiscal dimension throughout those five years, Huntsville's residents experienced a higher tax burden, a higher revenue burden, and a moderately more expensive government.

Once again, assuming a causal relationship with DEI, how are incentives responsible for what the index revealed? The first fact to highlight is that the identified trend from 2011 to 2016 is a fiscal deficit or a winner's curse outcome. Again, according to the empirical theory, the genesis of this problem must have begun a year or two before 2011, when the city granted an excessively large DEI package. Thus, the harmful cycle of economic development helps explain this result. Suppose the DEI package(s) cost more than what they generate. Accordingly, the likely causal mechanism explanation is the same as outlined for the case of Montgomery regarding the debt and the service-level dimensions—a fact elaborated on in the last section of this chapter.

Finally, It must be taken into account that the case of Huntsville is extraordinary since, unlike the other three cases, its index indicates two periods in which two upward trends or fiscal deficits were detected. Due to time and space considerations, the analysis focused on the most marked trend from 2011 to 2016. However, the trend from 2017 to 2020 is equally valuable for discussion and analysis. However, this last period will not be analyzed for the moment.

Huntsville T.F.E.I. reliability and validity. Thus far, Huntsville seems to be a good case study since its T.F.E.I., as a dependent variable, shows not only variation but the kind of variation that could be attributed to using economic incentives to lure businesses. However, its reliability must be analyzed carefully due to mixed results. For example, Table 4.21.

shows the correlation among the three index dimensions' ratios. Focusing on the revenue dimension shows a robust correlation between the own-sources and intergovernmental revenues ratios. However, the correlation between own sources revenues and the risk exposure factor ratios is weak (0.246), and the correlation between intergovernmental revenues and risk exposure factor ratios is also weak (0.255). The correlations between the debt dimension are also mixed. Only the correlations among the service-level solvency dimension seem consistently strong since all are above 0.6, as shown in Table 4.21. Nonetheless, special consideration must be given to the Cronbach alpha coefficient of 0.344. Such a low coefficient suggests the ten financial ratios do not hang together well.

On the contrary, the correlation across the three dimensions and the tax-to-income burden ratio seems robust, as shown in Table 4.22. For example, half the correlations in this Table are moderated, around 0.5, while the other half can be considered strong correlations, above 0.6. Regarding the validity of the Huntsville T.F.E.I., Table 4.24. shows the correlation among the index, per capita personal income, unemployment rate, and population. Mix results are also present here; however, the correlation between the index and these other indicators is acceptable. Only the correlation between the index and the unemployment rate is weak (-0.391); nevertheless, the correlation between the index and per capita personal income and population can be considered moderately solid as they gravitated above 0.5. Therefore, the Huntsville index can be reasonably considered an adequate dependent variable with the caveat of carefully considering its reliability.

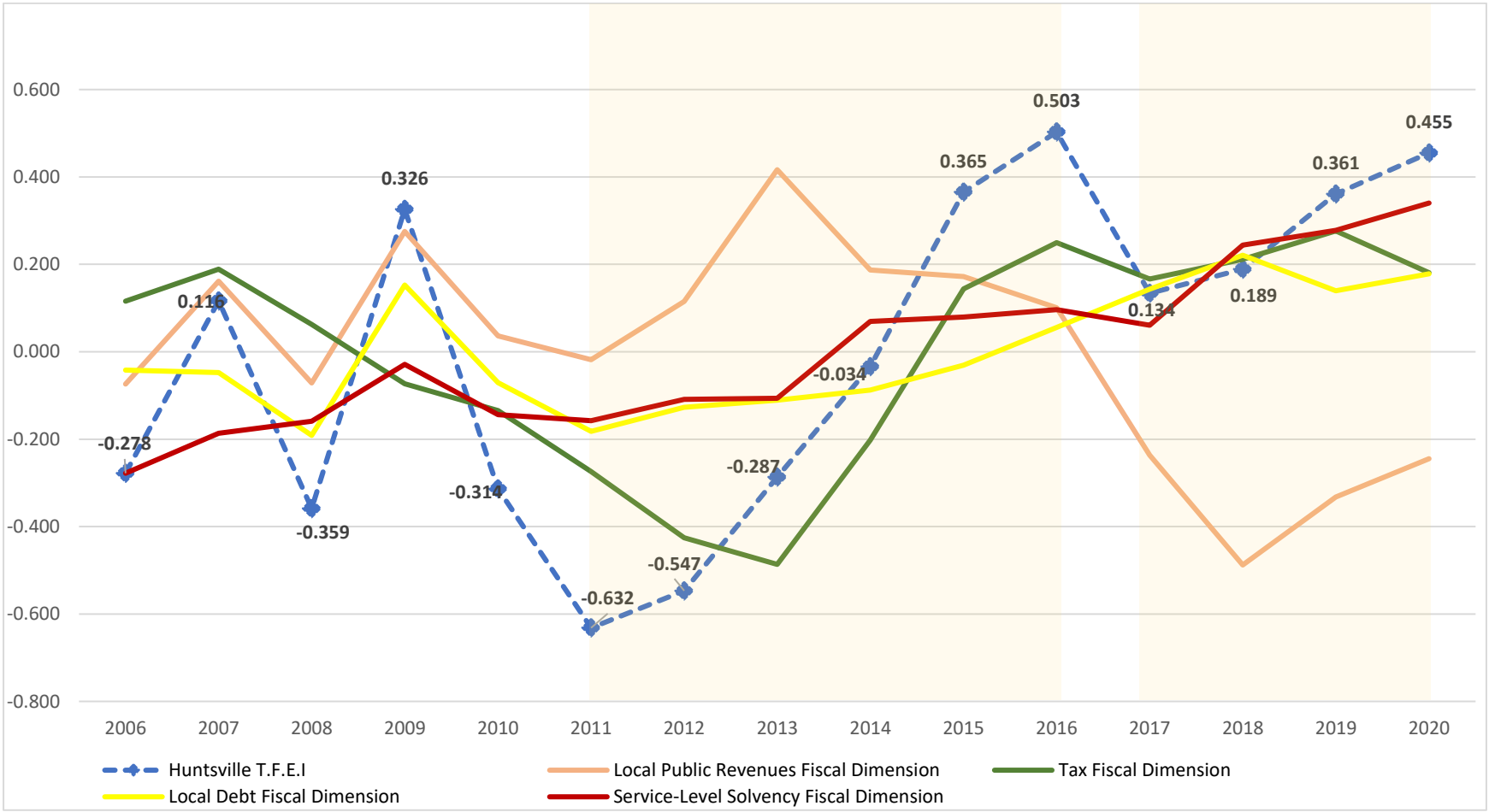

Figure 4.3. Line Graph of the Huntsville Total Fiscal Effect Index and its Constitutive Fiscal Dimensions, 2006—2020

Table 4.17. Huntsville Total Fiscal Effects Index (T.F.E.I.) and its Dimensions

Year	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension	Huntsville T.F.E.I.
2006	-0.074	0.116	-0.042	-0.278	-0.278
2007	0.162	0.189	-0.048	-0.187	0.116
2008	-0.071	0.062	-0.191	-0.159	-0.359
2009	0.275	-0.073	0.152	-0.029	0.326
2010	0.036	-0.135	-0.071	-0.144	-0.314
2011	-0.018	-0.274	-0.182	-0.158	-0.632
2012	0.115	-0.426	-0.127	-0.109	-0.547
2013	0.417	-0.486	-0.111	-0.106	-0.287
2014	0.187	-0.202	-0.088	0.069	-0.034
2015	0.172	0.144	-0.031	0.080	0.365
2016	0.101	0.250	0.056	0.097	0.503
2017	-0.237	0.166	0.143	0.061	0.134
2018	-0.488	0.212	0.221	0.244	0.189
2019	-0.333	0.277	0.140	0.278	0.361
2020	-0.244	0.181	0.178	0.340	0.455

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.18. Huntsville Financial Ratios (Standardized values)

Years	Local Public Revenues Fiscal Dimension				Local Debt Fiscal Dimension			Service-Level Solvency Fiscal Dimension		
	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-Assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	-0.922	-0.922	-0.600	0.723	1.241	-0.427	1.328	1.893	1.756	1.456
2019	-1.170	-1.181	-0.975	1.106	1.217	-0.500	0.958	1.630	1.758	0.780
2018	-1.772	-1.821	-1.285	0.847	1.428	-0.566	1.789	1.190	1.279	1.195
2017	-0.691	-0.683	-0.994	0.665	1.115	-0.537	1.142	0.674	0.414	-0.176
2016	1.114	1.109	-1.215	0.999	1.051	-0.717	0.337	0.669	0.771	0.008
2015	1.039	1.037	-0.356	0.576	0.878	-0.113	-1.131	0.367	0.342	0.486
2014	1.050	1.048	-0.224	-0.809	-0.266	-0.278	-0.509	-0.087	-0.025	1.150
2013	1.851	1.803	0.511	-1.946	-0.835	0.533	-1.028	-0.694	-0.512	-0.386
2012	0.443	0.458	0.249	-1.702	-0.725	-0.115	-0.688	-0.634	-0.684	-0.315
2011	-0.167	-0.149	0.137	-1.096	-1.101	-0.176	-0.911	-0.630	-0.759	-0.974
2010	0.046	0.065	0.251	-0.539	-0.830	0.016	-0.038	-0.674	-0.629	-0.858
2009	0.081	0.101	2.571	-0.292	-0.530	3.441	-1.081	-0.808	-0.870	1.248
2008	-0.533	-0.520	0.342	0.250	-0.892	-0.356	-1.048	-0.770	-0.854	-0.760
2007	0.419	0.435	0.762	0.755	-0.781	0.039	0.169	-0.885	-0.728	-1.185
2006	-0.787	-0.781	0.828	0.463	-0.970	-0.243	0.710	-1.241	-1.260	-1.668

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.19. Huntsville Financial Ratios

Years	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	0.956	0.044	0.304	14.752	0.629	0.166	0.709	1791.539	2246.414	2582.603
2019	0.961	0.039	0.260	15.082	0.627	0.161	0.677	1733.608	2246.818	2352.213
2018	0.973	0.027	0.223	14.859	0.646	0.155	0.748	1636.470	2126.998	2493.875
2017	0.951	0.049	0.258	14.703	0.617	0.158	0.693	1522.601	1910.858	2026.463
2016	0.916	0.084	0.231	14.989	0.611	0.144	0.624	1521.578	2000.033	2089.249
2015	0.918	0.082	0.333	14.626	0.596	0.190	0.499	1454.795	1892.770	2252.001
2014	0.917	0.083	0.349	13.433	0.490	0.178	0.552	1354.704	1801.019	2478.333
2013	0.903	0.097	0.436	12.454	0.438	0.240	0.508	1220.787	1679.145	1954.910
2012	0.929	0.071	0.405	12.664	0.448	0.190	0.537	1234.030	1636.348	1978.940
2011	0.941	0.059	0.391	13.186	0.414	0.185	0.518	1234.803	1617.544	1754.265
2010	0.937	0.063	0.405	13.666	0.439	0.200	0.592	1225.235	1650.015	1793.846
2009	0.936	0.064	0.680	13.878	0.466	0.463	0.503	1195.514	1589.706	2511.810
2008	0.948	0.052	0.416	14.345	0.433	0.172	0.506	1204.086	1593.617	1827.120
2007	0.929	0.071	0.466	14.780	0.443	0.202	0.610	1178.685	1625.107	1682.320
2006	0.953	0.047	0.473	14.529	0.426	0.180	0.656	1100.162	1492.326	1517.675

Source: Own creation based on data gathered from Huntsville Comprehensive Annual Financial Report from 2006 to 2020.

Table 4.20. Huntsville Financial Ratios Descriptive Statistics

Ratios	Mean	Median	Standard Deviation	Variance	Minimum	Maximum
Own-Source	0.938	0.937	0.019	0.000377161[a]	0.903	0.973
Intergovernmental Revenues	0.062	0.063	0.019	0.000377161[a]	0.027	0.097
Risk Exposure Factor	0.375	0.391	0.118	0.014	0.223	0.680
Tax-to-Income Burden	$14.13	$14.53	$0.86	$0.74	$12.45	$15.08
Liabilities-to-assets	0.515	0.466	0.092	0.008	0.414	0.646
Debt Service Burden	0.199	0.180	0.077	0.006	0.144	0.463
Available Legal Debt Limit	0.595	0.592	0.085	0.007	0.499	0.748
Tax per Capita	$ 1,373.906	$ 1,234.803	$ 220.672	$ 48,696.068	$ 1,100.162	$ 1,791.539
Revenue per Capita	$ 1,807.248	$ 1,679.145	$ 250.032	$ 62,515.930	$ 1,492.326	$ 2,246.818
Expenses per Capita	$ 2,086.375	$ 2,026.463	$ 340.924	$116,229.453	$ 1,517.675	$ 2,582.603

Source: Own creation based on data from Table 4.1; $n = 15$

[a] small value to be presented in three decimal digits

Table 4.21. Huntsville Correlation Matrix across Financial Ratios per each Dimension

Revenues Fiscal Dimension	Own-Source	Intergovernmental Revenues	Risk Exposure Factor
Own-Source	-	-	-
Intergovernmental Revenues	0.999**	-	-
Risk Exposure Factor	0.246**	0.255**	-
Debt Fiscal Dimension	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit
Liabilities-to-assets	-	-	-
Debt Service Burden	-0.343**	-	-
Available Legal Debt Limit	0.658**	-0.462**	-
Service-Level Solvency Fiscal Dimension	Tax per Capita	Revenue per Capita	Expenses per Capita
Tax per Capita	-	-	-
Revenue per Capita	0.992**	-	-
Expenses per Capita	0.698**	0.696**	-

***p <.01 Significant Level*

Cronbach Coefficient Alpha = 0.344

Table 4.22. Huntsville Correlation Matrix across Fiscal Dimension

	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden Ratio	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension
Local Public Revenues Fiscal Dimension	-	-	-	-
Tax-to-Income Burden Ratio	-0.608**	-	-	-
Local Debt Fiscal Dimension	-0.547**	0.624**	-	-
Service-Level Solvency Fiscal Dimension	-0.530**	0.472**	0.758**	-

***p <.01 Significant Level*

Table 4.23. Validity Test Data for the Huntsville T.F.E.I.

Year	Huntsville T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
2020	0.4550	$52110	3.2%	202,453
2019	0.3614	$49595	2.1%	199,637
2018	0.1892	$47729	3.4%	197,318
2017	0.1336	$45201	4%	196,289
2016	0.5029	$44068	5.5%	193,079
2015	0.3652	$44068	5.5%	190,943
2014	-0.0336	$42939	5.7%	188,325
2013	-0.2869	$41899	5.5%	186,252
2012	-0.5467	$41595	6.7%	183,865
2011	-0.6318	$40126	7.6%	182,319
2010	-0.3136	$38523	7.4%	180,105
2009	0.3260	$38090	7.2%	179,653
2008	-0.3589	$37938	3.7%	178,819
2007	0.1162	$36084	2.6%	174,938
2006	-0.2779	$34689	2.8%	173,189

Source: Own creation based on data gathered from Huntsville Comprehensive Annual Financial Report from 2006 to 2020.

Table 4.24. Huntsville Correlation Matrix for the T.F.E.I., Socio-economic and Demographic Variables

	Huntsville T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
Huntsville T.F.E.I.	-	-	-	-
Per Capita Personal Income	0.559**	-	-	-
Unemployment Rate	-0.391**	-0.279**	-	-
Population	0.605**	0.985**	-0.269**	-

***p <.01* Significant Level

Mobile

Mobile is the fourth and last city for which a total fiscal effect index was built. As shown in Figure 4.4., at first glance, there seems not to be any trend to scrutinize. The index for this city reveals a graph line consisting mainly of the ups and downs values of the index that are not continual beyond two years. Therefore, Mobile does not meet this dissertation definition of a trend that requires three or more years of a continued increment (fiscal deterioration) or three or more years of a continued decrement (fiscal improvement) of the index value. Nevertheless, "fluctuation (rather than a continuation) of measures may also deserve a closer look" (Wang 2012; 2014); therefore, it seems prudent to analyze periods from 2013 to 2015 and 2016 to 2018, and 2018 to 2020.

Hence, periods from 2013 to 2015 and 2016 to 2018 show a two-year downward slope. Conversely, the period from 2018 to 2020 exhibits a two-year upward slope. However, in the absence of a trend shown by the index, searching for trends in the three fiscal dimensions or the financial ratio can be equally helpful for an interpretative inspection. Hence, looking at Figure 4.4 and Table 4.4, the only fiscal dimension showing an upward trend from 2013 to 2017 is the service-level solvency fiscal dimension. This moderate but sustained four years increment can be further analyzed by looking at Table 4.26, which displays the standardized values of the three constitutive ratios of this fiscal dimension.

Thus, table 4.26 reveals that the only financial ratio that shows an uninterrupted increment is the tax per capita ratio; in 2013, the value of this ratio was -0.515, and in 2017 was 0.389. On the other hand, the revenue per capita ratio showed a sustained increase from 2013 (-0.614) to 2016 (0.394), then in 2017 decreased to 0.109. Finally, the expenses per

capita fell from 2013 to 2014 from -0.220 to -0.928 and a sustained increment from 2014 (-0.928) to 2017 (0.966). To better understand the above changes, it is necessary to look at Table 2.27, which shows the ratios' raw values. These numbers can be interpreted similarly as with the previous cases, Auburn, Montgomery, and Huntsville. However, one consequential fact that complicates the analysis of these ratio changes is that unlike Auburn, Montgomery, and Huntsville, Mobile population change was not sustained during the period of interest (see Table 4.31). This fact is important because these three ratios share population as their common denominator.

For example, the Auburn population grew uninterrupted during its respective period of interest from 2017 to 2020. On the other hand, Montgomery's population decreased uninterrupted from 2012 to 2016, and finally, Huntsville's population increased uninterrupted from 2011 to 2016. In contrast, the Mobile population increased from 2013 to 2015 and decreased from 2015 to 2017. Consequently, it is incorrect to make inferences about the changes in the tax and the revenue burden and Mobile's government expenses based on the total variations in the ratio and its population. Nonetheless, looking at the changes in the ratios, it can be stated that Mobile residents were worse off as they had been paying more taxes, the city was collecting more revenue, and the government was getting more expensive. These changes imply that Mobile's capacity to provide residents needed level of service was deteriorating from 2013 to 2017. At this point, no further analysis is warranted as a case for the usefulness of the index has already been made using the previous cities' examples. This dependent variable helps identify and analyze trends by disaggregating their constitutive components in a backward scrutiny process.

Mobile T.F.E.I. reliability and validity. A pressing concern regarding the reliability test for the Mobile T.F.E.I. is in order. Thus, Table 4.29 shows a similar pattern regarding the correlations across ratios in each of the three dimensions, as exhibited by Auburn and Montgomery. Although a cross-city comparison is not a methodological strategy in this investigation, it tells us that some similarities emerged regardless of the different data used to produce the ratios of each city.

Thus, we have contrasting correlation values for the revenues dimension ratios, one very strong at 0.999 and two weak below 0.3. Then we have moderated correlation values for the ratios about the debt dimensions (absolute values ranging from 0.35 to 0.65). Finally, we have strong correlation values for the ratios of the service-level-solvency dimension ranging from 0.69 to .099. Again, Auburn and Montgomery share this pattern. Until here, reliability looks acceptable; however, the Cronbach alpha coefficient equals -0.458. The moderate value of this coefficient is not a concern as much as it is the fact that it is a negative value.

These correlation values are not the only indicator of the index's reliability. The correlation values that assess the degree of association among the three dimensions must also be considered. Thus, Table 4.30 shows another pattern share with Montgomery, three correlation values that can be regarded as weak (absolute values ranging from 0.12 to 0.39), while the other half of correlation values can be considered robust (absolute values ranging from 0.62 to 0.72). In conjunction, all this information tells us that the index has an acceptable level of internal consistency but must be taken with caution in light of the negative value of the Cronbach alpha coefficient, like in the case of Auburn.

Finally, the index's validity (or predictive validity) has to be assessed using the correlation values among the index and socio-economic and demographic indicators. In general, the validity is moderated judging by the correlation coefficients shown in Table 4.32. None of the correlation values is bigger than the absolute value of 0.53. On the contrary, the correlation between the unemployment rate and the index is minimal, with an absolute value of 0.08. The other two correlation values of the index are 0.36 with per capita personal income and 0.51 with population. Therefore, it can be concluded that the Mobile index as a dependent variable must be considered carefully because there is no clear downward or upward trend, and the reliability and validity test indicate the presence of measurement errors.

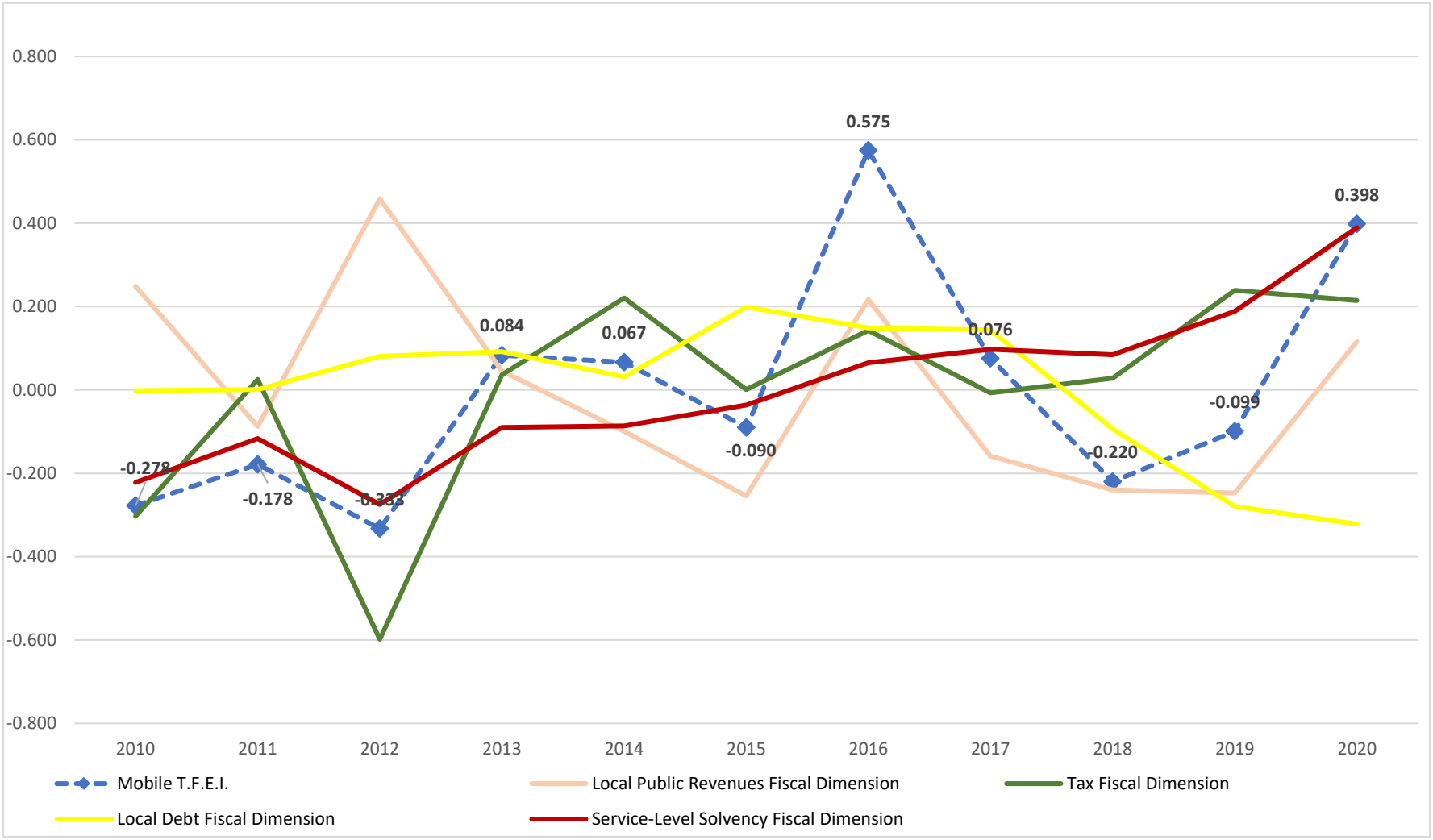

Figure 4.4. Line Graph of the Mobile Total Fiscal Effect Index and its Constitutive Fiscal Dimensions, 2010—2020

Table 4.4. Mobile Total Fiscal Effects Index (T.F.E.I.) and its Dimensions

Year	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension	Mobile T.F.E.I.
2010	0.249	-0.303	-0.002	-0.222	-0.278
2011	-0.088	0.025	0.001	-0.117	-0.178
2012	0.459	-0.598	0.081	-0.275	-0.333
2013	0.045	0.036	0.092	-0.090	0.084
2014	-0.099	0.221	0.032	-0.087	0.067
2015	-0.254	0.001	0.199	-0.036	-0.090
2016	0.217	0.143	0.149	0.066	0.575
2017	-0.159	-0.007	0.144	0.098	0.076
2018	-0.239	0.028	-0.094	0.085	-0.220
2019	-0.247	0.239	-0.280	0.189	-0.099
2020	0.116	0.215	-0.322	0.389	0.398

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.26. Mobile Financial Ratios (Standardized values)

Years	Local Public Revenues Fiscal Dimension				Local Debt Fiscal Dimension			Service-Level Solvency Fiscal Dimension		
	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-Assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	0.807	0.825	-0.469	0.859	-0.439	-1.676	-1.751	1.561	1.978	2.303
2019	-0.862	-0.873	-0.739	0.956	-0.509	-1.559	-1.287	1.191	1.094	0.543
2018	-0.884	-0.897	-0.614	0.114	0.493	-0.833	-0.785	0.722	0.385	0.162
2017	-0.729	-0.734	-0.122	-0.029	1.267	0.941	-0.483	0.389	0.109	0.966
2016	-0.247	-0.235	2.652	0.572	1.551	0.517	-0.281	0.299	0.394	0.291
2015	-0.891	-0.903	-0.747	0.004	1.486	0.765	0.133	0.170	0.099	-0.807
2014	-0.732	-0.737	0.478	0.884	-0.556	0.520	0.415	-0.189	-0.182	-0.928
2013	0.227	0.247	-0.022	0.144	-0.704	1.021	0.789	-0.515	-0.614	-0.220
2012	2.096	2.064	0.430	-2.393	-0.907	0.888	0.991	-1.712	-1.560	-0.849
2011	0.008	0.026	-0.912	0.100	-0.694	-0.459	1.166	-0.580	-0.481	-0.692
2010	1.207	1.216	0.064	-1.211	-0.989	-0.124	1.093	-1.336	-1.222	-0.771

Source: Own creation based on the methodology outlined in chapter 3.

Table 4.27. Mobile Financial Ratios

Years	Own-Source	Intergovernmental Revenues	Risk Exposure Factor	Tax-to-Income Burden	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit	Tax per Capita	Revenue per Capita	Expenses per Capita
2020	0.939	0.061	0.182	15938.793	0.580	0.067	0.214	637.077	837.477	781.751
2019	0.970	0.030	0.168	16028.511	0.574	0.069	0.268	612.966	777.007	688.874
2018	0.971	0.029	0.175	15248.267	0.669	0.076	0.327	582.324	728.503	668.819
2017	0.968	0.032	0.200	15115.863	0.744	0.094	0.362	560.626	709.584	711.222
2016	0.959	0.041	0.340	15672.727	0.771	0.090	0.386	554.769	729.090	675.620
2015	0.971	0.029	0.168	15146.698	0.765	0.092	0.434	546.331	708.889	617.685
2014	0.968	0.032	0.230	15961.376	0.569	0.090	0.467	522.955	689.724	611.299
2013	0.950	0.050	0.205	15276.233	0.555	0.095	0.510	501.695	660.161	648.657
2012	0.916	0.084	0.228	12925.486	0.535	0.093	0.534	423.578	595.418	615.485
2011	0.954	0.046	0.160	15235.462	0.556	0.080	0.554	497.455	669.255	623.753
2010	0.932	0.068	0.209	14020.362	0.528	0.083	0.546	448.117	618.513	619.563

Source: Own creation based on data gathered from Mobile Comprehensive Annual Financial Report from 2010 to 2020.

Table 4.28. Mobile Financial Ratios Descriptive Statistics

Ratios	Mean	Median	Standard Deviation	Variance	Minimum	Maximum
Own-Source	0.954	0.959	0.018	0.000336[a]	0.916	0.971
Intergovernmental Revenues	0.046	0.041	0.018	0.000336[a]	0.029	0.084
Risk Exposure Factor	0.206	0.200	0.051	0.002571[a]	0.160	0.340
Tax-to-Income Burden	$15,142.71	$15,248.27	$926.48	$858,358.14	$12,925.49	$16,028.51
Liabilities-to-assets	0.622	0.574	0.096	0.009163[a]	0.528	0.771
Debt Service Burden	0.084	0.090	0.010	0.000103[a]	0.067	0.095
Available Legal Debt Limit	0.418	0.434	0.117	0.014	0.214	0.554
Tax per Capita	$535.26	$546.33	$65.22	$4,254.05	$423.58	$637.08
Revenue per Capita	$702.15	$708.89	$68.43	$4,682.41	$595.42	$837.48
Expenses per Capita	$660.25	$648.66	$52.75	$2,782.33	$611.30	$781.75

Source: Own creation based on data from Table 4.1; $n = 11$

[a] small value to be presented in three decimal digits

Table 4.29. Correlation Matrix across Financial Ratios per each Dimension

Revenues Fiscal Dimension	Own-Source	Intergovernmental Revenues	Risk Exposure Factor
Own-Source	-	-	-
Intergovernmental Revenues	0.999**	-	-
Risk Exposure Factor	0.152**	0.154**	-
Debt Fiscal Dimension	Liabilities-to-assets	Debt Service Burden	Available Legal Debt Limit
Liabilities-to-assets	-	-	-
Debt Service Burden	0.288**	-	-
Available Legal Debt Limit	-0.339**	0.633**	-
Service-Level Solvency Fiscal Dimension	Tax per Capita	Revenue per Capita	Expenses per Capita
Tax per Capita	-	-	-
Revenue per Capita	0.978**	-	-
Expenses per Capita	0.786**	0.825**	-

***p <.01 Significant Level*

Cronbach Coefficient Alpha = -0.458

Table 4.30. Mobile Correlation Matrix across Fiscal Dimension

	Local Public Revenues Fiscal Dimension	Tax-to-Income Burden Ratio	Local Debt Fiscal Dimension	Service-Level Solvency Fiscal Dimension
Local Public Revenues Fiscal Dimension	-	-	-	-
Tax-to-Income Burden Ratio	-0.644**	-	-	-
Local Debt Fiscal Dimension	0.126**	-0.367**	-	-
Service-Level Solvency Fiscal Dimension	-0.399**	0.726**	-0.625**	-

***p <.01 Significant Level*

Table 4.31. Validity Test Data for the Mobile T.F.E.I.

Year	Mobile T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
2020	0.398	$40,112	9.3%	414,659
2019	-0.099	$38,243	3%	413,757
2018	-0.220	$38,243	4.5%	414,328
2017	0.076	$35,951	4.3%	413,955
2016	0.575	$35,348	6.9%	414,836
2015	-0.090	$35,348	7.2%	415,395
2014	0.067	$32,631	7.5%	415,123
2013	0.084	$32,843	7.4%	414,079
2012	-0.333	$32,771	8.7%	413,936
2011	-0.178	$32,651	10.4%	413,462
2010	-0.278	$31,962	10.8%	412,992

Source: Own creation based on data gathered from Mobile Comprehensive Annual Financial Report from 2010 to 2020.

Table 4.32. Mobile Correlation Matrix for the T.F.E.I., Socio-economic and Demographic Variables

	Mobile T.F.E.I.	Per Capita Personal Income	Unemployment Rate	Population
Mobile T.F.E.I.	-	-	-	-
Per Capita Personal Income	0.369**	-	-	-
Unemployment Rate	-0.081**	-0.533**	-	-
Population	0.512**	0.285**	-0.213**	-

***p <.01* Significant Level

Cases cross-comparison, a diverse-case outcome

The comparative method has been a valuable tool widely used thus far; for example, chapter three discusses "identifying trends" based on comparison strategies (page 109). In that section, a within-case comparison (changes over time) was identified as the most suitable strategy to uncover the total fiscal effects of using DEI. Thus, all discussions on the four cities were guided by comparing changes over time of a period of interest (three or more years of sustained change). Nonetheless, it is appropriate to finish this chapter by performing a cross-comparison of the four cities analyzed in this dissertation.

Recalling that one of the guiding principles of this chapter is to evaluate the suitability and usefulness of the T.F.E.I. index as a multi-dimensional dependent variable; a cross-comparison can aid in this endeavor. Chapter three also discussed the crucial importance of case selection when addressing methodological constraints (page 114). Then it was established that the main criterion for choosing the four cities examined in this chapter was to select cases that would allow for operationalizing the independent and dependent variables. Thus, a purposeful sample technique was used as a combined snowball/criterion sampling strategy. This strategy is not considered one of the nine case selection techniques of Gerring (2008). This author's work discusses nine possibilities for selecting cases from a large universe for in-depth case study analysis.

Curiously enough, the above discussion of the analysis of the results of each of the four cities, the cases, reveals that these cities can be considered "diverse cases." According to Gerring (2008), the diverse cases technique is defined as two or more cases that show the full range of variation of the independent variable (IV), the dependent variable (DV), or the relationship among both variables. This author also illuminates that

diverse cases can be used to test or generate a hypothesis; Gerring (2008) also explains that diverse cases enhance the sample's representativeness, although they might not correctly reflect the distribution of the population's variations.

In this case, the variation of importance is the variation in the dependent variable. For example, Auburn displayed the existence of a fiscal surplus from 2017 to 2020, Montgomery showed the presence of a fiscal deficit from 2012 to 2016, Huntsville also revealed the existence of a fiscal deficit from 2011 to 2016, and Mobile displayed the non-existence of DEI effects over the city public finances. In other words, this cross-case examination demonstrates that the index is a suitable dependent variable because it encompasses the full range of the possible theoretical expected variation. In the long run, discretionary economic incentives expenditures can cause a fiscal surplus or deficit or be inconsequential for the localities' public finances, as demonstrated by the four cases discussed here.

Regarding Gerring's (2008) assertion that diverse cases can help test hypotheses, the cases used here are perfect for such a purpose. For example, the condition to test the hypothesis regarding the causal relationship between DEI expenditure and the total fiscal effects index is to take this research to the next stage. Hence, the following research stage involves building the independent variable and then to use a fixed effect model to test the relationship between the DEI expenditure and the T.F.E.I. Nevertheless, Gerring (2008) also acknowledges the possibility of using diverse cases to generate new hypotheses. According to Patton(2002), an authority on the topic of purposeful sampling who refer to diverse cases as maximum variation (heterogeneity) sampling, hypothesis generation is possible because "[t]his sampling yields: '(1) high-quality, detailed descriptions of each case,

which are useful for documenting uniqueness, and (2) important shared patterns that cut across cases and derive their significance from having emerged out of heterogeneity.'"

This second, Patton's (2002) point, leads to hypothesis generation. For example, two curious patterns emerged from analyzing the results. The first is the inverse correlation between the tax-to-income burden ratio and the fiscal dimension of the local public revenues. The correlation coefficients are Auburn (-0.134), Montgomery (-0.291), Huntsville (-0.608), and Mobile (-0.644). This inverse correlation is notorious in the T.F.E.I. line graphs (figures 4.1 to 4.4) because when one line goes down, the other line goes up almost symmetrically. Therefore, this leads to conclude that their contribution to the index's overall value was, in all cases, virtually canceled out among themselves. This emerged pattern undoubtedly deserves a close examination because a generated hypothesis is that such an inverse relationship causes the minimization, if not elimination, of their contribution to the overall value of the T.F.E.I.

Another curious pattern from comparing such heterogeneous cases was the local debt fiscal dimension and the service-level solvency fiscal dimension within their respective periods of interest. In the first dimension, in all cases, the liabilities-to-assets ratio was the only one in which the value change trend was uninterrupted from the first to the last years. In contrast, the opposite does not hold for the debt service burden ratio and the available legal debt limit ratio. In other words, although there was a clear trend (shared with the liabilities-to-assets ratio), this trend was interrupted by ups and downs in the values of these ratios. The other unexpected pattern is seen in the service level solvency fiscal dimension. In this dimension, the tax and the revenue per capita change over time is more significant than the change over time in the expenses per capita ratio. Although the three ratios go in the same direction, the expenses per capita ratio change is more modest compared to the variation in the first two ratios. These unexpected curiosities deserve careful theorizing before enunciating hypotheses seeking to explain them.

Chapter 5

Dissertation Abridgment and Implications for the Next Research Phase

Dissertation Summary, the First Research Phase

As the opening of this dissertation show through the examples of Amazon headquarters in New York City and Northern Virginia (Arlington) and Topgolf in Mobile, AL, economic incentives packages to lure businesses is a salient topic that deserves attention. Its importance stems from the fact that its long-term fiscal consequences can affect negatively or positively the fiscal ability of local governments to provide the necessary level of services for an acceptable welfare level of their citizens.

For this reason, this investigation started to uncover the relationship between discretionary economic incentives and their long-term financial consequences for local governments. However, this project proved challenging due to a fundamental misunderstanding of the kind and types of variables at play. Years of exhaustive reading were needed to understand this was not typical research where variation in a couple of independent variables explains variation in the dependent variable. Instead, this investigation was about the variation in a single independent variable explaining variation in a multi-dependent variable. Therefore, the real challenge was constructing a measurement device to study this reality.

Hence, the second chapter focused on theoretically understanding how DEI affects local finances in the long run. Accordingly, chapter two shows that the most significant attractor seems to be job creation. New big companies are always desired for their promise to bring new jobs to the locality. This market-for-job approach led us to the auction-like

approach when we added that companies purposely pit localities against each other in the final stage of their site selection process. In this process phase, DEI seems to be a tool for LEDMs to tip the scale in their locality's favor. Nevertheless, the auction theory warms against what is known as the winner's curse outcome. In this interplay between site selection and job creation, localities might lure the company by offering a significant incentive package without realizing that this will hurt their finances in the long run.

The winners' curse theory used in this local economic development policy context has shed light on this phenomenon's market and psychological causes. All of which is incredibly challenging to measure. For example, in the case of the incentive package granted to Topgolf by Mobile's LEDMs, the voting process was astonishingly forceful. Nine out of ten individuals voted yes. Focusing on the psychological explanation, we must ask: was it a pro-business bias, competition neglect that leads to overconfidence and over-commitment, or a tendency to lose track of the total cost of actions that played the decisive role in the minds of the Mobile's LEDMs? Accurately answering this question is hard to explain, if not impossible.

To be academically impartial, a more relevant question is whether Mobil's LEDMs have committed a planning fallacy. Have they consciously or unconsciously overestimated the benefits of bringing Topgolf to Mobile while underestimating the costs of the 2.5 million (and its alternative use and other impacts)? Or have they made a good decision, a kind of investment decision with a profitable return? To give Mobil's LEDMs the benefit of the doubt, it is imperative to focus exclusively on the right side of the equation, focusing on the result rather than the determining factors. To this end, the analysis should not aim at calculating the expected returns of the DEI; instead, fiscal impact analysis insights can be

helpful. Thus, based on FIA, a simple mathematical definition of the winner's curse was derived. Local revenue, the taxes stream, the local public debt, and the local governments' solvency in providing LOS were then linked to the equation, as shown next.

Fiscal Surplus B' – B'' > C	Public revenues increment Taxes reduction Public debt decrement Enhanced government solvency to provide LOS
Fiscal Deficit B' – B'' < C B' ≷ B'' < C	Public revenue decrement Taxes levy increment Public debt increment Decrement in government solvency to provide LOS

The practicality of this empirical theory is that it allowed the operationalization of a fiscal surplus or deficit entirely in the context of using DEI and localities' finances. Thus, operationalization and measuring were the primary goal of chapter three. In addition, financial condition analysis, a subfield of public financial management, shed light on the usefulness of ratio analysis in measuring governments' fiscal health. Hence, after an extensive literature review, several ratios were selected to measure the financial condition of local revenues, local taxes, public debt, and the government's ability to provide with level-of-service. These four fiscal elements believed to absorb and reflect the consequences of DEI became dimensions after being operationalized using ten financial ratios. The final stage method and procedure to combine them into an index was possible after consulting specialized literature on index creation.

Thus, building the total fiscal effects index became the centerpiece of this investigation. Although fiscal condition analysis scholars have used this approach at state and local levels, it has never been used before to study the impact of DEI on local finances,

much less for localities in Alabama. Worthy of notice is that no single method exists to create an index for which consequential decisions were made along each step. Each decision made was backed and guided by the theory on building indexes, previous related examples, or both, so the path followed was methodologically sound. Nevertheless, it is worth mentioning the unforeseen consequence of the standardization method chosen to allow comparability and to avoid different ratios' values overshadowing one other. Hence, the z-score formula was selected, and this method created negative values, which makes it troublesome to interpret the T.F.E.I. and their fiscal dimensions.

This inconvenience materializes when an in-depth examination of a fiscal dimension requires disaggregating the index. Also, most of the calculations needed to test the reliability and validity of the index use those numbers derived from the standardization process. The difficulty in judging contrasting or mixed results leads to questions if such results would have been different (less opposing or more coherent) shall, a different standardization technique would have been used. Fortunately, however, another decision cancels the inconvenience of understanding and interpreting the negative values of the T.F.E.I. and their fiscal dimensions.

The literate on measuring government fiscal health also suggests different decision-making rules. Hence, due to its clear superiority (for this analysis in particular) over other methods, trend analysis was selected as the decision-making rule to perform the analysis. Thus, another advantage of building the T.F.E.I. index was identifying trends (positives or negatives). A trend, in this case, is understood as three years or more sustained upward or downward index tendency. Therefore, index negative numbers are inconsequential if a trend can still be identified for which graphing (line graphs) became an essential analysis

component. The description of the mechanical procedure selected to build the index mentioned above is a necessity because the final makeup of the index and its distinguishing features determines the hypothesis to be tested in the future.

Before enunciating the hypothesis, it is necessary to recall the empirical theory, which states that localities granting discretionary economic incentives packages to lure businesses impact, in the long run, their revenues stream, taxes stream, debt structure, and solvency to provide LOS to its residents. Based on this theory and the index, the derived hypothesis is that "localities positively influenced by their incentives program must exhibit low total fiscal effect index scores and a downward index trend. On the contrary, localities negatively impacted by their incentives program must exhibit high total fiscal effect index scores and an upward index trend." This hypothesis states that localities' DEI programs are the catalyst variable of the fiscal surplus or deficit observed through the lens of the index.

A curious nuance, if not a contrasting turn of events, is that the visual inspection of the graph line of the index in search of trends can be confusing. Such confusion can arise if the analyst does not keep in mind that a downward trend suggests the presence of a fiscal surplus, and conversely, an upward trend suggests the presence of a fiscal deficit. This way of having to interpret the index's visual inspection is the outcome of the meaning of the rations. A higher ratio value means bad news for the local finances and vice-versa; since all ratios have the same meaning (direction), their aggregation leads to this particular way of interpreting the index's graph line.

A paragraph linking chapters three and four to safeguard against methodological critics is needed in this summary. In closing this research project, all attention turned to constructing an index as a dependent variable, which did not exist before and is designed to

measure the impact of discretionary economic incentives for which four localities in Alabama were selected. Hence, total fiscal effects indexes were built for Auburn, Montgomery, Huntsville, and Mobile correspondingly. At first glance, this might be misunderstood as selecting cases with only the dependent variable in mind, which comparativists scholars have extensively warned against due to selection bias concerns.

Nevertheless, the selection process of those four cities was quite the opposite using a combined snowball/criterion sampling strategy, where those cities came at the top of the choice. Hence, those cities were selected first because of the high reputation of their economic incentive programs regarding record-keeping practices (the independent variable data) and second because they had public records of their CAFRs. Therefore, selection bias is not a methodological flaw. Consequently, chapter four presents the four indexes, their line graphs, and all information required to perform in-depth backward scrutiny by disaggregating them into their dimensions. Additionally, each fiscal dimension can also be disaggregated into its constitutive ratios. Finally, chapter four also shows the correlation tables used to judge each index's reliability and validity.

In this respect, there are several aspects to highlight. For instance, having built four indices, one for each locality, without aiming at the comparison among them was a good call. However, such a good decision derivates from the fact that of the four cities, only one exhibited a trend (as defined in this investigation) and simultaneously passed all reliability and validity tests. These mixed results have several implications for what follows beyond the confines of this dissertation. The first set of implications goes to the Auburn, Mobile, and Huntsville cases.

Auburn and Mobile did not exhibit any trend, but ups and downs adjustments from one year to another. The lack of a trend is not a concert at all. For example, this could show the city managers' effort to have balanced and healthy finances. Nonetheless, the most important implication for this investigation is that Auburn and Mobile are not precisely the best dependent variable; it might be futile to examine the relationship and the impact of DEI and the index where no trend exists. Moreover, although the validity tests for these cities' indexes look reasonably acceptable, the reliability tests for both cities' indexes show mixed results being a negative Cronbach alpha coefficient, the most puzzling anomaly in both cases.

On the other hand, Huntsville's T.F.E.I. seems to be a good dependent variable as does exhibit a clear trend, and the validity test is reasonably acceptable. Nonetheless, its reliability tests show mixed results being a Cronbach alpha coefficient low value of concern. Hence, having four different overall results was completely unexpected as the four indexes were built following the same procedure. The only expected difference was the line graph of each index, but not much difference in their respective validity and reliability outcomes. The bottom line is that the Huntsville case must not be discarded for conducting the second research phase. Instead, it suggests that a revision procedure for Huntsville is a mandate.

In other words, all calculations were made using an MS Excel spreadsheet, which requires more researcher involvement than better statistical software requires. Therefore, another statistical software such as SPSS, STATA, or R must replicate the index building and corroborate the results. If the same results are verified, the next step must be to use an alternative standardization process. The bottom line is that the Huntsville T.F.E.I must be

recalibrated. The second set of implications goes to Montgomery as its T.F.E.I was the only index exhibiting a trend and successfully passing the reliability and validity test. Consequently, Montgomery's case must be pursued to test the hypothesized cause-and-effect mechanism where DEI is the catalyst or explanatory variable influencing the localities' long-term total fiscal effect.

Moving Forward to the Second Research Phase: Montgomery DEI expenditure as the Independent Variable (IV)

Thus far, discretionary economic incentives have not been incorporated into the analysis. The hypothesis indicates that the index's composite value and its fluctuation or variation through time directly measure the long-term consequences over localities' public finances for using DEI to lure business. For Slattery and Zidar (2020), there are three approaches for measuring incentives; one is "expenditure-based," which measures incentives programs' outlays, which will be used in the second stage of the research. As specified in chapter two, an expenditure is equal to, in this case, the cost of the DEI package (assuming a package comprised of an array of different incentives) times the number of packages granted through the period of the study.

In 2011, the East-West Gateway Council of Governments (EWG) used a typology based on how public dollars were allocated to private entities to calculate the cost of economic development incentives. Thus, the East-West Gateway Council of Governments (2011) categorized incentives to entice businesses as taxes and total public tax commitment to date. The first category refers to tax dollars invested in or directed to development projects up to the most recent year for which data is available. The second category refers to the estimated tax dollars anticipated to be directed to development projects over the

projects' lives. According to the EWG, this second category is difficult to calculate; however, this category is useless because this research project focuses on ex-post rather than ex-ante evaluation.

Therefore, the expenditure-based approach measuring the independent variable annual change will focus on "tax dollars commitment to date." This category can be breakdown into three subcategories: programs that increase local taxes and fees, programs that abate local taxes, and projects that divert local taxes (East-West Gateway Council of Governments 2011). For example, tax increment financing (TIF) is an example of a public financing method subsiding for redevelopment, infrastructure, and other local development projects usually offered as part of the DEI packages, which divert local taxes. In this case, incremental tax dollars are diverted to a separate fund for the TIF district's life. According to the EWG, the funds must be explicitly used within the district for TIF-eligible expenses instead of being collected and distributed to their regular taxing districts/funds (East-West Gateway Council of Governments 2011).

On the other hand, an enterprise zone (EZ) is an example of a program that abates local taxes. Mead (2017) asserts that programs that abate taxes are "agreements between one or more governments and individuals or business in which (1) the government forgo taxes to which they otherwise would have been entitled and (2) the individual or business promises to do something that will benefit the public." In turn, a special taxing district (STD) is an example of a program that increases local taxes and fees for residents (sales taxes, property tax, or special assessment on property within the district). Enterprise zones and special taxing districts usually form part of the DEI local governments offer to lure businesses.

STD typically passes a new tax to be collected for and spent on project costs within the district. For example, most districts pass a sales tax, which can also be a property tax or a special assessment of the district's property (East-West Gateway Council of Governments 2011). In conclusion, in the following phase of the research, an annual expenditure-based approach will be used to build the explanatory variable as follows: the amount of tax commitment (tax dollars abated, diverted, and taxes and fees increment) times the number of incentive programs granted during a specific year.

Total fiscal effects modeling (TFEM)

A TFEM analysis specifies the relationship between financial and non-financial variables (Wang 2012, 2014). In this case, such specification means exploring the exact form of the relationship between DEI, socioeconomic and demographic variables, and the T.F.E.I. and its dimensions and constitutive ratios. This analysis is the culminated step of this research project, which can be summarized as follows. DEI expenditure influences socioeconomic and demographic variables, and the T.F.E.I.

Once the discretionary economic incentive expenditure is calculated annually, the complete data set for this analysis will be panel data. This is because, in the end, Montgomery data will comprise a time series (repeated measures) of DEI expenditure, non-financial variables (socioeconomic and demographic), and the Montgomery T.F.E.I. However, the trend analysis and the final number of observations collected will guide the statistical technique to examine the relationship between these three sets of variables. Such a statistical method will be established once all data is collected. Nevertheless, Tranel and Winter (2009), being a similar study to this research, shed light on a prospective statistical

method, the fixed-effects panel data model. Yet, the final decision of the TFEM analysis to be used remains to be determined.

Concluding Thoughts

As documented in the first chapter, the debate about using economic incentives as a local development tool for job creation is inconclusive due to mixed results. Nevertheless, progressing through this project clarified that generalization of results to the local level must not be pursued as it can be highly misleading because every locality is unique. Therefore, using DEI can be either positive, negative, or inconsequential. One of the reasons goes to the size of DEI packages. Discretionary economic incentives are not mega deals; therefore, their impact on local finances can be diluted. Another alternative explanation is that the number of new workers that will be attracted will not require increasing the level of public services.

Topgolf in Mobile exemplifies this reality. From those 150 new jobs promised, the deal specified that only 75 new jobs could be taken from new residents. Assuming every new worker from outside will come with a family and a typical family of four members, 300 new residents will be the number of immigrants coming to Mobile in the following years. Surely Mobile can take them without falling into fiscal stress. This fact means that "C," the indirect fiscal effects in the total fiscal effects equation derived in chapter two, does not necessarily have to be negative, as suggested by Fisher (2007). Therefore, this would alleviate the burden placed on "B," the direct burden effects, optimally leading to a low probability of a winner's curse outcome.

Finally, it must be highlighted that the primary intention of this research was not to uncover a hidden result (fiscal deficit or surplus) caused by the incentives program. Instead,

the main goal was to show local economic development managers that post-award assessment practice is within their reach, as procedural parsimony has been a guiding principle since the beginning of this investigation. In the future, only the total fiscal effect modeling, which is the last stage of this endeavor, requires specialized knowledge. However, at this stage LEDMs can consult specialists without compromising their understanding of the result.

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Appendix 1

Codebook

The following codebook provides all routes followed throughout each locality's CAFR to extract the required data for correctly calculating the ratios to build each locality's total fiscal effects indexes—first, the route, followed by the data to construct each ratio.

The Data Source for Calculating Each of Huntsville's Ratios

Huntsville's CAFR
↳ Basic Financial Statements
↳ Fund Financial Statements
↳ Governmental Funds (for ratios 1 and 2)
↳ Statement of Revenues, Expenditures, And Changes in Fund Balances
↳ Column: Total Governmental Funds (for Own-Source, and Intergovernmental Revenues)

A. Local Public Revenues Ratios

1) Own-Source = (1) Revenues of Own Sources / (2) Total Revenues. Where (1) is comprised of Sales & use taxes + Property taxes + Other taxes + Licenses & permits + Fines & forfeitures + Revenues from money & property + Charges for services – Intergovernmental + Gifts & donations + Other revenues. While (2) is Total revenues.

2) Intergovernmental Revenues = (1) Intergovernmental Operating Revenues / (2) Gross Operating Revenues. Where (1) is Intergovernmental, and (2) is Total revenues.

Government-Wide Financial Statements
↳ Statement of Activities (for ratio 3)
↳ Column: Net Revenue (Expense) & Changes in Net Position. Sub-columns: Total and Component Units (for Investment Revenues).
Fund Financial Statements
↳ Governmental Funds (for ratio 3)
↳ Statement of Revenues, Expenditures, And Changes in Fund Balances
↳ Column: Total Governmental Funds (for Intergovernmental Revenues, Transfers in, and Own revenue sources)

3) Risk Exposure Factor = (1) (Investment Revenues + Intergovernmental Revenues + Transfers In) / (2) Own revenue sources. Where in (1) Investment revenues is Interest on investments (total and component units) and the two other categories remains the same. While (2) is Total revenues – Intergovernmental.

B. Taxes Ratios

Huntsville's CAFR
- Governmental Activities Tax Revenues by Source (for Total taxes)
- Demographic and Economic Statistics (for Personal Income)

4) Tax-to-Income Burden = (1) Total taxes / (2) Total Personal Income. Where (1) is comprised of Sales and Use Tax + Property Tax + City Leasing + City Liquor + City Lodging + City Gasoline + City Wine + City Tobacco + State Gasoline + Huntsville Utilities P.I.L.O.T. + T.V.A. P.I.L.O.T. + State Beverage + State Tobacco + All Other. While (2) is Total Personal Income.

C. Local Debt Ratios

Financial Section
- Basic Financial Statements
  - Government-Wide Financial Statements (for ratio 6)
    - Statement of Net Position (for Total Liabilities and Total Assets)

6) Liabilities-to-assets = (1) Total Liabilities / (2) Total Assets. Where (1) and (2) are found labeled as their appears in the ratio.

Statistical Section (for ratios 7)
- Financial trends
  - Changes in fund balances of governmental funds (for Debt Service Burden)

7) Debt Service Burden = (1) Total Debt Service / (2) Total Revenue. Where (1) is comprised of Principal + Interest + Fiscal charges + Debt issuance costs. While (2) is taking from ratio one.

Statistical Section (for ratios 8)
- Legal Debt Margin Information (for General Bonded Debt and Legal Debt Limit)

8) Available Legal Debt Limit = General Bonded Debt / Legal Debt Limit. Where (1) is Total net debt applicable to limit and (2) is Debt limit.

D. Service-level solvency Ratios

Statistical Section (for ratios 9)
- Governmental Activities Tax Revenues by Source (for Total taxes)
- Demographic and Economic Statistics (for Population)

9) Tax per Capita = (1) Total Taxes / (2) Population. Where (1) is comprised of Sales and Use Tax + Property Tax + City Leasing + City Liquor + City Lodging + City Gasoline + City Wine + City Tobacco + State Gasoline + Huntsville Utilities P.I.L.O.T. + T.V.A. P.I.L.O.T. + State Beverage + State Tobacco + All Other. While (2) is Total Population.

10) Revenue per Capita = (1) Total Revenues / (2) Population. Where (1) is taken from the denominator of the Own-Source ratio, while (2) is taken from the denominator of Tax per Capita Ratio.

Statistical Section (for ratios 11)
↳Financial trends
↳Changes in fund balances of governmental funds (for Total Expenses)

11) Expenses per Capita = (1) Total Expenses / (2) Population. Where (1) is Total expenditures while (2) is taken from the denominator of Tax per Capita Ratio.

The Data Source for Calculating Each of Auburn's Ratios

Auburn's CAFR
↳Basic Financial Statements
↳ Fund Financial Statements
↳Governmental Funds (for ratios 1 and 2)
↳Statement of Revenues, Expenditures, And Changes in Fund Balances
↳Column: Total Governmental Funds (for Own-Source, and Intergovernmental Revenues)

A. Local Public Revenues Ratios

1) Own-Source = (1) Revenues of Own Sources / (2) Total Revenues. Where: (1) is comprised of Sales and use taxes + Occupational license fees + Motor fuel taxes + Lodging taxes + Rental and leasing taxes + Other taxes + Licenses and permits + General property taxes + Charges for services + Fines and forfeitures – State shared taxes + Contributions from the public – Grants + Program income + Interest + Miscellaneous. While (2) is Total revenues.

2) Intergovernmental Revenues = (1) Intergovernmental Operating Revenues / (2) Gross Operating Revenues. Where (1) is comprised of State shared taxes + Grants. While (2) is Total revenues.

Government-Wide Financial Statements
↳Statement of Activities (for ratio 3)
↳Column: Net Revenue (Expense) & Changes in Net Position. Sub-columns: Total and Component Units (for Investment Revenues).
Fund Financial Statements
↳Governmental Funds (for ratio 3)
↳Statement of Revenues, Expenditures, And Changes in Fund Balances
↳Column: Total Governmental Funds (for Intergovernmental Revenues, Transfers in, and Own revenue sources)

3) Risk Exposure Factor = (1) (Investment Revenues + Intergovernmental Revenues + Transfers In) / (2) Own revenue sources. Where in (1) Investment revenues is Interest and investment earnings (total and component units). Intergovernmental Revenues is Total revenues – State shared taxes – Grants, and the last category remains the same. While (2) is Total revenues – State shared taxes – Grants.

B. Taxes Ratios

Statistical Section (for ratios 4)
- General Government Tax Revenues by Source (for Total taxes)
- Demographic and Economic Statistics (for Personal Income)

4) Tax-to-Income Burden = (1) Total taxes / (2) Total Personal Income. Where (1) is comprised of Sales & Use Tax + Cigarette & Alcohol Tax + Motor Fuel Tax + Lodging and Rental Tax + Financial Institution Tax + Motor Vehicle Tax + General Property Tax. While (2) is Total Personal Income.

C. Local Debt Ratios

Basic Financial Statements
- Government-Wide Financial Statements (for ratio 6)
  - Statement of Net Position (for Total Liabilities and Total Assets)

6) Liabilities-to-assets = (1) Total Liabilities / (2) Total Assets. Where (1) and (2) are found labeled as their appears in the ratio.

Statistical Section (for ratios 7)
- Financial trends
  - Changes in fund balances of governmental funds (for Debt Service Burden)

7) Debt Service Burden = (1) Total Debt Service / (2) Total Revenue. Where (1) is comprised of Principal + Interest. While (2) is taking from ratio one.

Statistical Section (for ratios 8)
- Legal Debt Margin Information (for General Bonded Debt and Legal Debt Limit)

8) Available Legal Debt Limit = General Bonded Debt / Legal Debt Limit. Where (1) is Total net debt applicable to limit and (2) is Debt limit.

D. Service-level solvency Ratios

Statistical Section (for ratios 9)
- General Government Tax Revenues by Source (for Total taxes)
- Demographic and Economic Statistics (for Population)

9) Tax per Capita = (1) Total Taxes / (2) Population. Where (1) is comprised of Sales & Use Tax + Cigarette & Alcohol Tax + Motor Fuel Tax + Lodging

and Rental Tax + Financial Institution Tax + Motor Vehicle Tax + General Property Tax. While (2) is Total Population.

10) Revenue per Capita = (1) Total Revenues / (2) Population. Where (1) is taken from the denominator of the Own-Source ratio, while (2) is taken from the denominator of Tax per Capita Ratio.

Statistical Section (for ratios 11)
↳ Financial trends
↳ Changes in fund balances of governmental funds (for Total Expenses)

11) Expenses per Capita = (1) Total Expenses / (2) Population. Where (1) is Total expenditures while (2) is taken from the denominator of Tax per Capita Ratio.

The Data Source for Calculating Each of Mobile's Ratios

Mobile's CAFR
↳ Basic Financial Statements
↳ Fund Financial Statements
↳ Governmental Funds (for ratios 1 and 2)
↳ Statement of Revenues, Expenditures, And Changes in Fund Balances
↳ Column: Total Governmental Funds (for Own-Source, and Intergovernmental Revenues)

A. Local Public Revenues Ratios

1) Own-Source = (1) Revenues of Own Sources / (2) Total Revenues. Where: (1) is comprised of Taxes + Licenses & permits – Intergovernmental + Charges for services + Fines & forfeitures – State and federal assistance + Interest + Other revenues. While (2) is Total revenues.

2) Intergovernmental Revenues = (1) Intergovernmental Operating Revenues / (2) Gross Operating Revenues. Where (1) is comprised of Intergovernmental + State and federal assistance. While (2) is Total revenues.

Government-Wide Financial Statements
↳ Statement of Activities (for ratio 3)
↳ Column: Net Revenue (Expense) & Changes in Net Position. Sub-columns: Total and Component Units (for Investment Revenues).
Fund Financial Statements
↳ Governmental Funds
↳ Statement of Revenues, Expenditures, And Changes in Fund Balances (for ratio 3)

Column: Total Governmental Funds (for Intergovernmental Revenues, Transfers in, and Own revenue sources)

3) Risk Exposure Factor = (1) (Investment Revenues + Intergovernmental Revenues + Transfers In) / (2) Own revenue sources. Where in (1) Investment revenues is Investment income (total and component units). Intergovernmental Revenues is comprised of Intergovernmental + State and federal assistance and the last category remains the same. While (2) is Total revenues – Intergovernmental – State and federal assistance.

B. Taxes Ratios

Statistical Section (for ratios 4)
- Governmental Activities Tax Revenues by Source (for Total taxes)
- Demographic and Economic Statistics (for Personal Income)

4) Tax-to-Income Burden = (1) Total taxes / (2) Total Personal Income. Where (1) is comprised of Property Taxes + Sales Tax + Motor Fuels Tax + Room Tax + Alcoholic Beverage Tax + Rental and Leasing Tax + Tobacco Tax + Financial Excise Tax + Other Taxes. While (2) is Total Personal Income.

C. Local Debt Ratios

Basic Financial Statements
- Government-Wide Financial Statements (for ratio 6)
  - Statement of Net Position (for Total Liabilities and Total Assets)

6) Liabilities-to-assets = (1) Total Liabilities / (2) Total Assets. Where (1) and (2) are found labeled as their appears in the ratio.

Statistical Section (for ratios 7)
- Financial trends
  - Changes in fund balances of governmental funds (for Debt Service Burden)

7) Debt Service Burden = (1) Total Debt Service / (2) Total Revenue. Where (1) is comprised of administrative charges + Bond issuance costs + Interest + Principal retirement – Interest reimbursement. While (2) is taking from ratio one.

Statistical Section (for ratios 8)
- Legal Debt Margin Information (for General Bonded Debt and Legal Debt Limit)

8) Available Legal Debt Limit = General Bonded Debt / Legal Debt Limit. Where (1) is Total net debt applicable to limit and (2) is the same as it appears in the ratio.

D. Service-level solvency Ratios

Statistical Section (for ratios 9)
↳Governmental Activities Tax Revenues by Source (for Total taxes)
↳Demographic and Economic Statistics (for Population)

9) Tax per Capita = (1) Total Taxes / (2) Population. Where (1) is comprised of Property Taxes + Sales Tax + Motor Fuels Tax + Room Tax + Alcoholic Beverage Tax + Rental and Leasing Tax + Tobacco Tax + Financial Excise Tax + Other Taxes. While (2) is Total Population.

10) Revenue per Capita = (1) Total Revenues / (2) Population. Where (1) is taken from the denominator of the Own-Source ratio, while (2) is taken from the denominator of Tax per Capita Ratio.

Statistical Section (for ratios 11)
↳ Financial trends
↳Changes in fund balances of governmental funds (for Total Expenses)

11) Expenses per Capita = (1) Total Expenses / (2) Population. Where (1) is Total expenditures while (2) is taken from the denominator of Tax per Capita Ratio.

The Data Source for Calculating Each of Montgomery's Ratios

Montgomery's CAFR
↳Basic Financial Statements
↳ Fund Financial Statements
↳Governmental Funds (for ratios 1 and 2)
↳ Statement of Revenues, Expenditures, And Changes in Fund Balances
↳Column: Total Governmental Funds (for Own-Source, and Intergovernmental Revenues)

A. Local Public Revenues Ratios

1) Own-Source = (1) Revenues of Own Sources / (2) Total Revenues.
Where: (1) is comprised of Taxes + Licenses & permits – Intergovernmental revenues + Charges for services + Fines & forfeitures + Interest + Miscellaneous revenues. While (2) is Total revenues.

2) Intergovernmental Revenues = (1) Intergovernmental Operating Revenues / (2) Gross Operating Revenues. Where (1) is Intergovernmental revenues, and (2) is Total revenues.

Government-Wide Financial Statements
↳ Statement of Activities (for ratio 3)
↳ Column: Net Revenue (Expense) & Changes in Net Position. Sub-columns: Total and Component Units (for Investment Revenues).

Fund Financial Statements
↳ Governmental Funds
↳ Statement of Revenues, Expenditures, And Changes in Fund Balances (for ratio 3)
↳ Column: Total Governmental Funds (for Intergovernmental Revenues, Transfers in, and Own revenue sources)

3) Risk Exposure Factor = (1) (Investment Revenues + Intergovernmental Revenues + Transfers In) / (2) Own revenue sources. Where in (1) Investment revenues is Investment earnings (total and component units) and the last two categories remains the same. While (2) is Intergovernmental revenues.

B. Taxes Ratios

Statistical Section (for ratios 4)
↳ Tax Revenues by Source, Governmental Funds (for Total taxes)
Demographic and Economic Statistics (for Personal Income)

4) Tax-to-Income Burden = (1) Total taxes / (2) Total Personal Income. Where (1) is comprised of City Sales Tax + Real and Personal Property Tax + Motor Fuel Tax + Lodging Tax +Alcoholic Beverage Tax +Tobacco Tax + Rental Tax. While (2) is Total Personal Income.

C. Local Debt Ratios

Basic Financial Statements
↳ Government-Wide Financial Statements (for ratio 6)
↳ Statement of Net Position (for Total Liabilities and Total Assets)

6) Liabilities-to-assets = (1) Total Liabilities / (2) Total Assets. Where (1) and (2) are found labeled as their appears in the ratio.

Statistical Section (for ratios 7)
↳ Financial trends
↳ Changes in fund balances of governmental funds (for Debt Service Burden)

7) Debt Service Burden = (1) Total Debt Service / (2) Total Revenue. Where (1) is comprised of Principal payments + Interest + Debt issuance costs. While (2) is taking from ratio one.

Statistical Section (for ratios 8)
↳ Legal Debt Margin Information (for General Bonded Debt and Legal Debt Limit)

8) Available Legal Debt Limit = General Bonded Debt / Legal Debt Limit. Where (1) is Total net debt applicable to limit and (2) is Debt limit.

D. Service-level solvency Ratios

Statistical Section (for ratios 9)
- Tax Revenues by Source, Governmental Funds (for Total taxes)
- Demographic and Economic Statistics (for Population)

9) Tax per Capita = (1) Total Taxes / (2) Population. Where (1) is comprised of City Sales Tax + Real and Personal Property Tax + Motor Fuel Tax + Lodging Tax +Alcoholic Beverage Tax +Tobacco Tax + Rental Tax. While (2) is Total Population.

10) Revenue per Capita = (1) Total Revenues / (2) Population. Where (1) is taken from the denominator of the Own-Source ratio, while (2) is taken from the denominator of Tax per Capita Ratio.

Statistical Section (for ratios 11)
- Financial trends
  - Changes in fund balances of governmental funds (for Total Expenses)

11) Expenses per Capita = (1) Total Expenses / (2) Population. Where (1) is Total expenditures while (2) is taken from the denominator of Tax per Capita Ratio.