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Windfall Payment Savings: An Examination of Act 13 Disbursements in Pennsylvania

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Windfall Payment Savings: An Examination of Act 13 Disbursements in Pennsylvania

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Dedication

Thank you to my family and friends who made this project possible. I am most grateful.

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Abstract

State and local governments occasionally receive positive exogenous payments or windfalls that have a significant impact on their budgets. However, few works examine how budget-makers allocate such payments or if they are consumed in a manner consistent with other revenue streams. Prior research suggests that multiple factors, including the size of a windfall payment, impact how much of the funds are saved and spent. Using data from the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania, this study examines the relationship between windfall payment size and savings rates between 2011 and 2019. The results of the study indicate that windfall size is a significant indicator of savings rates and that a curvilinear relationship between payment size and savings rates exists.

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Chapter 1: Introduction

State and local governments benefit tremendously from intergovernmental transfers, legal settlements, and other payments that inject cash into their budgets. These positive, exogenous shocks, or *windfalls*, may lead public officials to create rainy day funds, increase spending, decrease taxes, or establish new programs and initiatives that otherwise would not exist (Berset & Schelker, 2020; Drescher et al., 2020; Heyndels & Van Driessche, 2002). Despite the importance of these payments for state and local governments, few studies examine how public officials consume them or if public budgeting norms apply to their allocation (Paler, 2013). While public officials may spend and save windfalls the same as other standard revenue streams like taxes and fees, a growing body of research suggests that the special nature of the payments (i.e., the fact that the funds are from outside the jurisdiction or are unanticipated) may influence the budgeting process (Heyndels & Van Driessche, 2002; Karger & Rajan, 2020; Paler, 2013; Rucker, 1984).

Traditional approaches to public budgeting suggest that the actors involved in budget-making and the context in which the budgeting process occurs help explain how governments allocate funds. Like any other funding source, one would examine lobbyists, interest groups, political parties, and current economic conditions to understand how windfall payments are consumed. However, current research suggests that the traditional budgeting literature and its emphasis on the politics of budgeting may not be as relevant in explaining windfall payment decision-making as other research streams, which lean heavily on insights from behavioral economics.

The literature outside of the politics of budgeting stream suggests that public officials may be inclined to spend a windfall payment differently than the revenue raised from within the

jurisdiction (e.g., taxes, fees, and fines) (Hines & Thaler, 1995; Mehiriz & Marceau, 2014). According to scholars in behavioral economics, public officials may perceive windfalls differently from endogenous revenue sources and consequently ignore traditional budgeting norms (Da et al., 2015; McKay, 2000). Research suggests, for example, that a windfall payment may be perceived as a bonus or type of *mad money* item that can be spent more freely than endogenous tax revenue (Becker et al., 2020). Such perceptions may be significantly influenced by the size of the windfall payment relative to the overall budget. Studies evaluating windfall size indicate that individuals are more likely to spend than save small windfalls. However, few works examine that phenomenon in the public arena (Abdel-Ghany et al., 1983; Heyndels & Van Driessche, 1998, 2002; James P. Keeler et al., 1985; Rucker, 1984).

This study explored the relationship between windfall size and savings rates in the local government setting. Using data from the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania distributed to municipalities, the study compared the size of the payment from Act 13 relative to municipal budgets from 2011 to 2019 to understand if municipalities saved payments that were larger and spent payments that were smaller. The findings of the study help inform the work of scholars and practitioners alike who wish to better understand windfall payment decision-making in the public arena.

This chapter will provide context to the study, present the problem statement, identify the research question and hypotheses, explain how the study advances the field of public budgeting, and examine the limitations of the study. The later chapters will review the current literature on public budgeting and windfall payments, the methods employed, and the findings of the study. The conclusion will explain the significance of the study and its applications for scholars and practitioners.

Background of the Study

State and local governments come into found money on occasion. That is, they receive payments that occur with irregularity or are outside of normal revenue streams. Such payments come about because of grants, fees, charges, intergovernmental transfers, or even lawsuits and legal settlements. Examples of recent windfalls to public organizations in the United States include the COVID-19 relief funds distributed to state and local governments and monies distributed to the states as a part of the Volkswagen emissions scandal settlement. These windfalls, and the many others that exist, represent a positive exogenous shock to public coffers and, as such, may offer a budgetary opportunity for public officials that did not previously exist (Berset & Schelker, 2020; Nikolova & Marinov, 2017; Speight & MacDonald, 1989; Sylvain Leduc & Daniel Wilson, 2017).

Given the impact windfalls can have on state and local governments (in some cases, windfalls may exceed normal revenue streams, especially at the local government level), citizens and public officials should understand how budget-makers allocate the funds. While many windfall payments made to public organizations have rules or regulations that stipulate how the funds are to be expended, exceptions to the rules and situations in which those rules are ignored exist (Heyndels & Van Driessche, 1998; Mehiriz & Marceau, 2014; Paler, 2013; Sloan et al., 2005; Stotsky, 1991). In cases where the restrictions placed on funds are ambiguous or ignored, windfalls may be tantamount to lottery winnings or bonuses for budget-makers.

Furthermore, few works examine how state and local public officials spend and save windfall payments. While there is a robust body of literature on public budgeting broadly, there is a dearth of information regarding windfall payments specifically. Much of the literature on public budgeting suggests that budget-makers are revenue agnostic and treat windfalls as any

other payment (Caiden, 1985; Kelly & Wanna, 2000; Levine et al., 1981). But a competing body of literature contends that windfall payment decision-making is more complex and relies on mental accounting methods and other behavioral phenomena to explain consumption patterns (Becker et al., 2020; Heyndels & Van Driessche, 1998; Thaler, 1999).

Problem Statement

Prior to the study, few works examined how collective decision-making bodies, like state and local governments, consume windfall payments. While many studies evaluated how private individuals consume windfalls, few applied those concepts to public organizations (Clark, 2002; Drescher et al., 2020; Epley & Gneezy, 2007; Kreinin, 1961; Reid, 1962). This study addressed the gap in the literature by examining payments from the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania municipalities. Specifically, the study examined whether the size of the payments distributed under Act 13 impacted how much of the windfall public officials spent and saved.

The importance of windfalls, and later windfall size, emerged in the research of Friedman (1957), Bodkin (1959), Doenges (1966), Landsberger (1966), Abdel-Ghany et al. (1983), Rucker (1984), and Keeler et al. (1985). Rucker (1984) found that the size of a windfall was the most critical discriminator in savings and consumption. Abdel-Ghany et al. (1983) and Keeler et al. (1985) found that small windfalls received by individuals tended to be spent, whereas large windfalls tended to be saved. Such findings directly contradicted earlier works concerning windfalls and the permanent income hypothesis (Abdel-Ghany et al., 1983; James P. Keeler et al., 1985).

Research from behavioral economics supports the work of Abdel-Ghany et al. (1983), Rucker (1984), and Keeler et al. (1985) by suggesting that mental and emotional processes may

lead decision-makers to perceive small windfalls as meaningful shocks to their wealth and spend the funds more freely (Milkman & Beshears, 2009). These mental and emotional processes identified by the researchers, collectively referred to as *mental accounting methods*, influence how individuals save and spend funds every day. A growing body of work tests the existence of these methods and suggests that budgeting is more complex than previously thought (Thaler, 1999, 2008; Yuntong Gou et al., 2013).

Despite the significance of these findings, few studies explore whether such patterns apply in public settings. While previous research studies provide evidence for how individuals consume windfall payments, most do not attempt to understand if collective decision-making bodies, like local or state governments, consume them in the same way. In one case where mental accounting and windfall payments were examined in the public setting, researchers found that public officials were influenced by mental accounting methods when controlling the public purse (Heyndels & Van Driessche, 1998). This study sought to build off that work and others by examining the importance of windfall size in the public arena.

Understanding how and why state and local governments allocate windfall payments the way they do is important to scholars and practitioners for two reasons. First, windfall payments often have an intended purpose (and ideal consequences) established by the granting body. The grantors distributing the payments want the guidelines for usage to be followed. Should those guidelines be ignored, or the funds spent in a way different from what is intended, then the grantors might consider new guidelines or consequences for misuse in the future. If, for example, payments are disbursed to a local government to defray the costs associated with a natural disaster and the funds are instead allocated to tax decreases or raises for public officials, then the entire purpose of the funds would be undermined, and the grantor may seek redress. Given the

potential impact these funds have on finance and policy, understanding how officials treat them is warranted.

Second, windfalls may present a significant opportunity to change the status quo for a state or local government. If public officials perceive windfall payments as a type of mad money budgeting item, they may not be as strategic in their use of the funds. In some cases, the special monies may even lead to corruption or misuse (Nikolova & Marinov, 2017). Understanding key predictors in the consumption of windfalls thus becomes an important public policy and management question.

As special payments to state and local governments are made now, and in the future, policymakers should understand if the funds are treated differently than endogenous revenue. And if the payments are treated differently, policymakers should understand how and why. Special payments may be misused or lead to suboptimal policy outcomes without this understanding. For these reasons, windfall payments require further examination in the literature.

Research Question and Hypothesis

This quantitative research study examined the relationship between windfall payment size and savings at the local government level. The predictor variable was the size of the windfall payment received by municipalities, and the criterion variable was the savings rate. Operationally, *saving* referred to an allocation to capital reserves made by municipalities receiving the payment. This approach assisted in answering the following research question and hypotheses:

RQ: To what extent does the relative size of a windfall payment impact savings rates?

H0: The relative size of the Act 13 payment will have no impact on savings rates.

H1: The relative size of the Act 13 payment will have a statistically significant impact on savings rates.

H2: Municipalities that receive relatively small payments will be more likely to spend the windfall than municipalities that receive relatively large payments.

Advancing Knowledge and Practical Applications

This research study advances the scientific knowledge by expanding upon the work of the economists evaluating windfall payments and the behavioral economists exploring the theories of fungibility, mental accounting, labeling, anticipation of payments, and emotional attachments to funds (Abeler & Marklein, 2017; Arkes et al., 1994; Thaler, 1999). Specifically, the work tested findings from the work of Abdel-Ghany et al. (1983), Rucker (1984), and Keeler et al (1985) to the public sector. Through quantitative analysis, the relationship between windfall payment size and consumption patterns became clear.

Given the importance of windfall payments to public decision-makers in contemporary America (at the time of this publication, payments from COVID-19 to state and local governments were receiving much attention), more research should be conducted to identify how public officials behave when faced with a payment outside of typical revenue streams. If public officials treat windfall payments differently than typical revenue streams (e.g., taxes and fees) by spending them freely, for example, then new rules and regulations guiding how the payments are used may be warranted. Identifying these consumption patterns will help guide scholars and practitioners alike in the future.

Rationale for the Methodology

This study employed quantitative techniques to examine the relationship between windfall payment size and savings patterns of windfall payments in the public setting.

Specifically, the study utilized a fixed-effects panel regression, and later a quadratic regression, to evaluate the relationship between windfalls and savings rates. Similar methods have been used extensively in the literature. Researchers have adopted fixed-effects models and panel data in the windfall payment stream for private individuals and public organizations, as well as the body of work concerning behavioral economics (Anessi-Pessina & Sicilia, 2015; Christiaensen & Pan, 2010; Heyndels & Van Driessche, 1998, 2002; Marques & Pires, 2019; Snoddon, 2004).

Limitations and Delimitations

Two significant limitations outside of the control of the researcher exist for the study. These limitations included the following:

1. Data made available by the Pennsylvania Public Utilities Commission (PUC) and the Department of Community and Economic Development (DCED) are self-reported by the municipalities. Therefore, the accuracy of the data is subject to the municipalities' skills, abilities, and desires to present information accurately. Changes to budgets versus what was reported to the agencies were probable. Therefore, slight differences were likely to exist for at least some municipalities.
2. Within the data set, missing values existed. For some locales in different years, data was not made available. While missing values were sparse, they inevitably impacted the model.

In addition, two significant delimitations exist. The delimitations included:

1. The study focused exclusively on Pennsylvania and its municipalities. Certainly, many other states and municipalities receive windfall payments that differ significantly in size and structure from those disbursed through the Act 13 Unconventional Natural Gas Impact Fee.

2. The researcher employed quantitative techniques only. No surveys, interviews, or other qualitative methods were included in the study's design.

While neither the limitations nor delimitations were unusual for this type of study, they inevitably impacted the study and its generalizability.

Summary

Despite the importance of windfall payments for the public purse, a gap in the literature concerning how public entities save and consume windfalls exists. This quantitative research study addressed that gap by exploring the relationship between windfall payment size and savings in Pennsylvania municipalities between 2011 and 2019. Specifically, the research examined savings rates for municipalities that received payments from the Act 13 Unconventional Natural Gas Impact Fee. The study built on existing literature on windfall payments, consumption, and behavioral economics and explored whether windfall size impacts savings rates.

In the following chapters, the researcher reviews the extant literature and conducts the quantitative analysis. Chapter 2 presents a review of the pertinent literature and the theoretical foundations of the study. Chapter 3 reviews the methods employed by the researcher to examine the relationship between payment size and consumption. Chapter 4 presents the results and chapter 5 explores implications of the study and provides direction for future research.

Chapter 2: Literature Review

Positive, exogenous shocks or windfalls present a unique opportunity for budget-makers. The newfound monies from a windfall payment may be saved to establish rainy day funds, fill budget holes, reduce taxes, or fund new programs or initiatives. To understand how public officials allocate the funds from a windfall, one might review the vast body of literature on public budgeting. Over the past several decades, researchers have examined various aspects of public budgeting and developed positive and normative frameworks for understanding budget regimes in the United States and abroad (Caiden, 1985; Levine et al., 1981; Wildavsky, 1988).

Despite such a large body of work, research specifically focused on windfall payments in the public sector is scarce (Paler, 2013). The extant literature addresses some cases where states and municipalities receive windfall payments, but the work is limited. Furthermore, few studies examine any windfall-specific frameworks for understanding the budgeting implications of such payments (Aragon & Casale, 2017; Heyndels & Van Driessche, 2002; Niemeyer et al., 2004; Sloan et al., 2005).

Considering this scarcity, reviewing the body of work focused on individuals and windfall payments proves helpful. Unlike the traditional literature on the politics of budgeting, emerging research suggests that the perception of these payments as budgetary windfalls may influence how policymakers treat them (Basili et al., 2008; Heyndels & Van Driessche, 1998; Mehiriz & Marceau, 2014). Public officials may be inclined to spend or save the funds in a manner that is different from endogenous taxes or fees, for example, because the funds may present an opportunity to depart from typical budgeting processes (Heyndels & Van Driessche, 1998). The literature from behavioral economics contends that this is so because budgetary

decision-makers may be highly influenced by mental accounting methods when dealing with such payments and treat the funds as a bonus or gift (Levav & Mcgraw, 2009; Thaler, 2008).

Such explanations are a radical departure from the standard budgeting literature, which emphasizes the role of politics in the budgeting process. A myriad of studies spanning multiple decades finds that lobbyists, interest groups, and public officials, as well as economic and political circumstances, significantly influence budget decision-making (Ahrens & Ferry, 2018; Caiden, 1985; David D. Laitin & Aaron Wildavsky, 1988; Kelly & Wanna, 2000; Naomi Caiden, 2010; Wildavsky, 1975, 1988). However, these studies do not generally address windfall payments (Paler, 2013). And while the field of behavioral economics offers valuable insights like those mentioned, most of the conclusions from that field apply to individual decision-makers and have not yet been applied or tested in public settings where collective decision-making occurs (Heyndels & Van Driessche, 2002).

Given the importance of windfall payments to public decision-makers in contemporary America (states have received vast sums of money from legal settlements, for example), more research should be conducted to identify how public officials behave when faced with a payment outside of standard revenue streams (e.g., taxes and fees). If public officials treat windfall payments differently than standard revenue streams by spending them freely, for example, new rules and regulations guiding how they are used may be warranted.

This chapter will define the term *windfalls*, examine traditional approaches to public budgeting, discuss windfall payment consumption, and examine observations from behavioral economics concerning windfall payments. Finally, the section will discuss Act 13 in Pennsylvania. The discussion regarding Act 13 will exhibit how and why the Unconventional Natural Gas Impact Fee established in the Commonwealth serves as an excellent illustration of

windfall payment decision-making and how it can be used to better understand the importance of the relative size of a windfall payment in budgeting processes.

Defining Windfalls

Numerous definitions of the term *windfall* exist in the economics and public finance literature. Some of the earliest definitions were proposed in the 1950s and 1960s by scholars examining the consumption of post-war payments made by the US government to soldiers of World War II. Researchers were interested in identifying if the soldiers spent the post-war payments differently than earned income. In those studies, the researchers found varying consumption levels, with some scholars finding the marginal propensity to consume the windfall at or below .3 while others found it to be as high as .72 (Bodkin, 1959; Friedman, 2018; Reid, 1962).

The early studies on windfall payments defined *windfalls* as substantial monetary transfers that were unanticipated and transitory in nature (Buddelmeyer & Peyton, 2014; Friedman, 1957). Friedman's rather broad definition was clarified by Reid (1962), who claimed that windfalls are "inheritances and occasional large gifts of money from persons outside the family… and net receipts from the settlement of fire and accident policies" (Reid, 1962). Other scholars built off of the work of Friedman (1958) and Reid (1962) and argued that payments from life insurance benefits, gambling winnings, cash gifts, and cash legacies should also be considered windfalls worthy of study (Bodkin, 1959; Kreinin, 1961; Reid, 1962). Despite the slight differences, in nearly all cases, scholars emphasized the unexpected and temporary nature of the payments or receipts as crucial characteristics of windfall payments to individuals.

More recently, scholars, especially those in behavioral economics, consider any payment outside of normal circumstances to be a windfall, regardless of size or expectation. Small and

large payments as well as some repeated payments outside of ordinary income, are all considered windfalls (Basili et al., 2008; Clark, 2002; Milkman & Beshears, 2009). The scholars engaged in this research contend that small gifts, cash bonuses, and even coupons or rebates are windfall payments. According to the research, the abnormality of the payment or departure from the status quo is the defining feature of a windfall payment, regardless of size and repetition (Buddelmeyer & Peyton, 2014; Epley et al., 2006; Epley & Gneezy, 2007).

In the public finance arena, definitions of windfalls vary more widely. For example, Heyndels and Van Driesshe (2002) contend that windfalls are merely exogenous budgetary shocks that can come about through various circumstances, including grants and economic, legislative, and administrative taxes. In other words, windfalls are merely outside, found money passed along to governing bodies. Paler (2013) qualifies the definition by arguing that a windfall in the public arena "generates [economic] rents or incomes that can be substantial in scale, is paid by external actors, and accrues directly to governments without necessitating bureaucratic capacity or interaction with citizens" (Paler, 2013). The former definition focuses on the exogenous source of the funds while the latter emphasizes the nature of the payment and its implications for the recipient, with a particular emphasis on institutions for dealing with such payments. Like the definitions provided by the behavioral economists, both definitions still emphasize the departure from the status quo as the critical hallmark of a budgetary windfall.

For the purposes of this study, the term *windfall* will apply the broader conceptualization provided in the literature. In other words, the study will consider any payment to a governmental body that falls outside the status quo to be a windfall. Thus, positive exogenous shocks, like legal settlements, stimulus payments, and fees/fines, will all be considered windfalls that merit examination in the public arena. When presented with a windfall, understanding how

governments behave is important as positive exogenous budgetary shocks create opportunities that may not exist with typical or traditional revenue streams.

The Importance of Understanding Windfall Spending in the Public Arena

Numerous high-profile windfalls have been dispersed to state and local governments. In the 1990s, states received large sums from the Tobacco Master Settlement Agreement. Many years later, states received payments from Volkswagen as a part of the settlement for the company's emissions cheating scandal. And at the time of this publication, states and municipalities received payments from the federal government in response to the COVID-19 pandemic. Identifying these budgetary shocks as windfalls and understanding how governments treat them is critical to advancing the public budgeting literature. If these payments are somehow treated differently by public officials, much in the same way individuals tend to treat personal windfalls differently from income (Abdel-Ghany et al., 1983; Bodkin, 1959; Milkman & Beshears, 2009), then more research should be completed to understand how and why these differences exist. This section will briefly discuss each windfall, its importance for public budgeting, and why additional work is necessary.

Tobacco Master Settlement Agreement. On November 23, 1998, five major U.S. tobacco manufacturers settled a lawsuit with 46 states, the District of Columbia, and five U.S. territories. The plaintiffs in the suit sought compensation for Medicaid costs of treating smoking-related illnesses. The settlement in that suit, which came to be known as the Master Settlement Agreement (MSA), ordered the tobacco companies to pay $206 billion for 25 years to the plaintiffs.

Immediately after the settlement, states used the funds to address public health concerns related to smoking. But as time went on, many states veered away from smoking-related

expenses and used the funds to plug budgetary holes and pay for various other initiatives (C. L. Johnson, 2004; Niemeyer et al., 2004). In a comprehensive review of the MSA, Sloan et al. (2005) analyzed the effects of voter characteristics, political parties, interest groups, prior spending on public tobacco control programs, and state fiscal health on allocations to tobacco control, health, and other programs. The researchers found that most of the variables had a significant impact on the allocation of funds toward (and away from) tobacco-related programs (Sloan et al., 2005). Ultimately, the funds were expended with no particular regard for or deference to public health-related expenses and the settlement arrangement became another revenue source for budget makers in several states.

The works of Johnson (2004), Niemeyer et al. (2004), and Sloan et al. (2005) provided important insights into the MSA. However, they did not approach the settlement from a windfall payment perspective. Thus, situated squarely in the traditional budgetary literature, the work of Sloan et al. (2005) and others ignored perceptions of the windfall and the ways in which public officials treated the payments. Consequently, a gap in the literature exists. It is possible, for example, that because the funds were unearned by the states, officials were more likely to spend the funds for whatever was needed than save them or allocate them strictly toward public health expenditures. Another possibility is that the funds were considered a gift or bonus that freed up resources for other budgetary priorities. Either alternative is possible but remains unexplored in the literature.

Further examination of the MSA is warranted, given the impact the funds had on state budgets. Currently, it is unclear whether the settlement reinforced political budgetary regimes or presented an opportunity for state officials to suspend or move away from traditional budgetary

influences (e.g., political actors and economic circumstances). Understanding if such a departure occurred could provide insights to scholars and practitioners alike.

Volkswagen Settlement. In 2015, researchers at West Virginia University discovered software installed in Volkswagen vehicles that allowed diesel engines to cheat emissions tests in the United States and abroad. An investigation revealed that the company not only knew about the software but also actively developed and installed it with the intent of circumventing clean air laws. After the investigation, several Volkswagen executives were charged and imprisoned for the fraud. Additionally, several civil lawsuits were filed against the company. One of the lawsuits in the United States was settled, and the funds from the settlement were used to establish an Environmental Mitigation Trust (EMT). The EMT contained $2.9 billion to be distributed to the states to reduce transportation emissions (Aragon & Casale, 2017).

While the EMT stipulates how the funds should be spent, no comprehensive account of the funds exists. Furthermore, little scholarly work has been completed to examine how the monies have been spent or how any expenditures have been justified (Aragon & Casale, 2017; Jung & Sharon, 2019). Given this gap, future studies should identify any trends in budgetary allocations. More specifically, studies should examine whether the windfall payments were treated as other revenue streams or if other processes took hold, given the payment's nature as an exogenous positive shock.

Examining the Volkswagen settlement as a windfall for states named in the suit presents an opportunity to better understand budgetary windfalls and how public officials perceive them. Additional work must be completed to determine whether additional guidelines are needed to ensure that the funds are expended in a consistent way with the EMT. Without additional work,

the use of the funds could mirror those of the MSA, whereby the intents of the payment were lost over time.

COVID-19 and Local Government Relief. The United States government delivered $350 billion to state, local, and Tribal governments to support them during the COVID-19 pandemic. Under the law, local governments could use the funds to replace lost public sector revenue, respond to the adversities associated with the pandemic, provide hazard pay for essential workers, and invest in water, sewer, and broadband infrastructure (Clemens & Veuger, 2020). While these guidelines presented some structure to the statute, a great deal of ambiguity remained. Consequently, the treatment of the funds remains unclear in the literature.

Multiple case studies examining how local governments expended the COVID-19 relief funds exist. Krueger et al. (2021) found that the City of Dallas, Texas, relied heavily on the funds to stabilize departmental budgets within the municipality. Despite instituting hiring freezes and furloughs, the City faced dire financial consequences without the funds (Krueger et al., 2021). Similarly, Singla et al. (2021) conducted a study of Phoenix, Arizona, and observed that a slight rule change in the statute opened usage of the funds and allowed the City to balance its budget. Specifically, federal guidelines changed and allowed previously budgeted payroll allocations to be supplemented by relief payments (Singla et al., 2021). Without that rule change, Phoenix faced a nearly $100 million shortfall. The relief funds proved instrumental in balancing the cities' budgets in both cases. Furthermore, both cities treated the payments as any other revenue stream and behaved in a manner consistent with the traditional budgeting literature (Levine et al., 1981).

Despite the extensive review of the cities' usage of the relief funds, questions remain regarding the windfall payment. One such question pertains to the rule change. Would officials

have used the funds to fill the budget hole had the change not occurred? And if so, how would that have impacted other expenditures? These questions align with the windfall payment literature and exemplify why a better understanding of these nuanced responses proves necessary.

The MSA, Volkswagen settlement, and COVID-19 relief payments show the importance of windfall payments for state and local governments. Had the funds not been distributed, the financial trajectories of the cities and states in all three examples would have been altered. Furthermore, in all three cases, guidelines for the funds were ambiguously interpreted or ignored by the recipients. Considering this ambiguity, understanding how the payments were spent and why officials allocated them is critical for understanding public finance and public policy.

The Politics of Public Budgeting

Scholars of public budgeting argue that the expenditures made using the MSA, Volkswagen settlement, and COVID-19 emergency funds are illustrative of the politics that permeate the public budgeting process. In each case, budgetary actors use their influence within a set environment to determine how the funds could and should be spent (Caiden, 1985; David D. Laitin & Aaron Wildavsky, 1988; Levine et al., 1981; Naomi Caiden, 2010). Thus, to examine how windfall payments are expended, one must understand the actors involved and factors at play throughout the public budgeting process.

This stance is supported by a vast body of literature on public budgeting within the arenas of public policy and public administration. That body argues that public budgeting is an inherently political process in which competing interests seek funds (Rubin, 1993, 2019). Generally, the literature addresses the actors and circumstances that affect that budgetary process (Kelly & Wanna, 2000; Stone, 2015; Wildavsky, 1988). In terms of actors, Levine et al. (1981)

identify citizens (or voters), elected officials, and interest groups/lobbyists as the most influential parties in the budget-making process. Depending on the level of engagement of each of these actors, policy outcomes and budgetary decisions vary. Deliberations in public organizations often reflect the competing interests of each of these actors and their desire for scarce resources.

Equally important as the actors in the decision-making process is the context in which decisions are made. In the literature concerning public budgets, fiscal stress and social/political discontent are critical in defining the context in which budgets are determined (Pilaar, 2018). The health of the overall economy, contractions in the local market, and declining support from upper levels of government all impact public budgets in the United States (Nguyen-Hoang & Hou, 2014; Snoddon, 2004). Combined, the wishes of various actors and the context in which budgeting occurs have a tremendous impact on the allocation of funds in public organizations (Levine et al., 1981).

Given its preoccupation with budgetary actors and contexts, the public budgeting literature primarily treats windfalls as another revenue stream (Heyndels & Van Driessche, 1998; Paler, 2013). As such, traditional public budgeting contends that regardless of the source of revenue, the actors involved in budgetary decision-making and the context in which the budgeting occurs prove most important in understanding how the revenue is spent (John B. Gilmour & David E. Lewis, 2006; Kelly & Wanna, 2000; Schick, 1994; Wildavsky, 1988). Save for rules and regulations dictating how money can be allocated (as with block grants and other intergovernmental transfers), decision-makers are generally revenue agnostic when allocating funds (Shadbegian, 1999; Stine, 1994). In other words, research in this stream considers funds to be completely fungible in the eyes of public officials.

The revenue agnosticism of budget-makers and the fungibility of funds have been explored in several studies, especially at the state and local levels (Blom-Hansen et al., 2014; Yan, 2011). Numerous studies within the politics of budgeting literature, for example, found that governments often value a revenue's source less than the amount of revenue raised when allocating funds, especially when facing a budgetary shortfall (Levine et al., 1981; Stine, 1994). Many communities balance budgets by introducing new or unusual taxes, fees, and fines despite the sources having negative impacts on their communities (Graham & Makowsky, 2021). Thus, according to the public budgeting literature, windfalls, while advantageous, elicit no more thought or care than any other fund in the public purse.

With the idea of revenue agnosticism in mind, all windfall payments made to a state or local government, according to the scholars within the traditional public budgeting stream, would be treated like any other revenue source. Political actors would compete to direct the funds toward their desired programs or initiatives while operating within the confines of vocal citizens, elected officials, and overarching economic conditions. Few other variables (if any) prove salient in determining how the funds would be treated and ultimately expended by public officials.

Windfalls, Consumption, and Savings

Outside of the public budgeting literature is a body of work explicitly examining windfall payments. Much of that work began in the 1950s and 1960s by scholars examining the consumption of post-war payments made by governments to soldiers of World War II. Researchers wanted to know whether the soldiers who received the payments spent them the same or different from their earned income. In those studies, the researchers found varying consumption levels, with some scholars finding the marginal propensity to consume at or below

30 percent while others found them to be as high as 72 percent (Bodkin, 1959; Friedman, 1957; Reid, 1962).

The work of those scholars first began with Milton Friedman. Friedman's landmark work, *Theory of the Consumption Function* examined windfall payments and advanced the theory of the Permanent Income Hypothesis (Friedman, 1957). The Permanent Income Hypothesis stipulates that income can be considered permanent or transitory. Permanent income includes regular payments and savings, while transitory income includes random or accidental payments—like those given for life insurance claims, gambling winnings, and inheritances. Friedman argued that permanent income and permanent consumption are correlated and constant over time. Unlike permanent income, however, transitory income and consumption are uncorrelated. As a corollary, Friedman (1957) noted that transitory income does not give rise to consumption. Using this theory, Friedman posited that individuals are much more likely to consume based on their permanent income rather than their transitory income—a notion that has been supported by various scholars over the years (Joseph P. DeJuan & John J. Seater, 2006; Kreinin, 1961).

Despite the central tenets of the permanent income hypothesis, Friedman conceded that at least some consumption of a windfall occurs. Friedman determined that the marginal propensity to consume the payment would be about .3. Therefore, it was reasonable to assume that about 30 percent of a windfall would be consumed by a recipient (Friedman, 1957, 1958). Otherwise, consumption tracks much more closely with permanent income. Building off the work of Friedman, Bodkin (1959) also examined post-war payments to evaluate windfall payment consumption. In his work, he rejected Friedman's findings. According to Bodkin, the marginal propensity to consume a windfall was much higher—between .72 and .97. Unlike

Friedman, Bodkin (1959) argued that windfall payments were highly correlated with spending, and individuals who received windfalls were much more likely to spend a large majority of the funds (Bodkin, 1959).

Reid (1962) examined the results of Friedman and Bodkin and sought to reconcile the findings. In her study, she found that the post-war payments stimulated the purchase of dwellings and other durable goods. However, the marginal propensity to consume out of transitory income was less than the marginal propensity to consume out of disposal income. Such findings were more consistent with Friedman's hypothesis and rejected the level of consumption observed by Bodkin (1959) (Reid, 1962).

Additional works attempted to determine the points at which the marginal propensity to consume increases and decreases. Using data from 598 households in Boulder, Colorado, that received various types of windfall income, Doenges (1966) found that larger payments tended to be saved and smaller ones spent. Similarly, Abdel-Ghany (1983) found that the marginal propensity to consume regular income was greater than the marginal propensity to consume windfall income for windfalls that were large relative to regular income. Using data from the 1972 consumer expenditure survey, Keeler et al. (1985) also found that the marginal propensity to consume a windfall decreased as the relative size of the payment increased. In each of these studies, the researchers showed that some level of consumption of windfall payments tended to occur and that the size of the windfall impacted consumption (Abdel-Ghany et al., 1983; Doenges, 1966; James P. Keeler et al., 1985).

Scholars have recently found mixed effects for the marginal propensity to consume. Japelli & Pistaferri (2014) examined the marginal propensity to consume using the Survey Household Income and Wealth (SHIW) conducted in 2010 by Banca di Italia. In that survey, the

researchers found that respondents consumed about 48 percent of windfall gains (Tullio Jappelli & Luigi Pistaferri, 2014). Similarly, Drescher et al. (2020) found a high level of consumption in survey data from across Europe. Using data from the Eurosystem Household Finance and Consumption Survey (HFCS), the researchers found that households, on average, spent between 33% (the Netherlands) and 57% (Lithuania) of such a windfall payment. Although, a wide range of consumption was observed from country to country (Drescher et al., 2020).

Studies show that at least some portion of windfall payments are consumed and that consumption is not purely a function of permanent income. However, just how much is consumed ranges and is contingent on several factors, including windfall size relative to overall income. Understanding the relationship between windfall payments and consumption is important because, as Bodkin pointed out, fiscal policies like tax cuts and stimulus payments rely on consumption to be effective (Bodkin, 1959). Therefore, researchers and practitioners must understand how windfall payments are treated to understand if the payments will achieve their intended goals.

Insights from Behavioral Economics

While not directly tied to the early work on windfall payments, new research from behavioral economics offers several valuable insights to explain why consumption of windfalls occurs, and the marginal propensity to consume varies. This section will briefly describe the behavioral economics concepts of fungibility, mental accounting, labeling, emotional attachments, and timing/anticipation, as well as how they can be helpful in understanding windfall payment decision-making better. The section will also show how the work of the behavioral economists can inform the work of this study and others.

Fungibility Consumer choice theory posits that all money is fungible. In other words, any unit of money is substitutable for another. Under this theory, earned income, for example, has the same value as gifts, winnings, and inheritances. Despite its prominence in the literature, however, fungibility is not guaranteed. A multitude of studies shows that the assumption of fungibility is regularly violated by decision-makers. In reality, individuals spend funds more or less freely based on their perceptions of the monies (Abeler & Marklein, 2017; Thaler, 1999; Yuntong Gou et al., 2013).

Researchers stress that the assumption of fungibility is violated because of cognitive and emotional influences involved throughout the decision-making process. In short, decision-makers adopt non-fungible tendencies because of their perceptions, experiences, and emotions. Violations of the fungibility assumption are copious in the literature. Numerous studies show that individuals treat some monies differently and refuse to view all funds as substitutable, even when they logically should be (Abeler & Marklein, 2017; Hines & Thaler, 1995; Thaler, 2008).

The non-fungibility of certain income or revenue helps to explain the consumption of windfalls. If decision-makers perceive windfalls differently than other income or revenue streams, then they are less likely to substitute the funds and use windfalls in the same way. For private decision-makers, this could mean that a check received on a birthday, for example, might be spent very differently than a check received on a payday because of the emotions attached to the special event. Similarly, public officials may spend funds from a windfall distributed by the federal government, which may conjure more positive feelings, differently than the revenue raised through local taxes, which may conjure more negative feelings. In the latter case, the emotional and cognitive influences of the decision-makers could be more explanatory of windfall consumption patterns than more traditional factors, like interest groups and lobbyists.

Mental Accounting Closely related to fungibility is the concept of mental accounting. Mental accounting is defined as the cognitive tools and processes used by individuals to organize, appraise, and manage finances (Hossain, 2018; Pressman, 2006; Thaler, 1999). In essence, mental accounting is a system of rules and short-cuts individuals use to make economic decisions. Structures built into mental accounting systems frequently defy rationality as they are emotionally driven and cognitively flawed. Consequently, mental accounting methods may lead to illogical or suboptimal decisions for decision-makers.

Scholars of mental accounting support their work mainly through experiments and controlled studies. Hossain (2018) provides a comprehensive review of these studies and concludes that the growing body of work provides reasonable support for the existence and pervasiveness of mental accounting methods. Furthermore, he notes that many studies focused on mental accounting have tremendous implications for economics and public policy (Hossain, 2018).

Mental accounting methods may be just as prevalent in public officials as in private individuals. While public officials generally operate within the confines of public budgeting standards, alternate processes, as described by mental accounting may also be employed. Therefore, personal mental and emotional cues may significantly impact how budget-makers allocate funds and offer an alternative view of public budgeting that has not yet been fully explored.

Labeling Within the mental accounting systems adopted by decision-makers lie mental accounting labels. Labels refer to the identifiers individuals assign to various monies or funds for organizational purposes. Just as individuals may separate funds physically, they may also separate them psychologically. Thus, individuals are inclined to mentally separate vacation

budgets from rent, groceries, gasoline, etc. By labeling funds mentally, decision-makers create a schema for expenditures that can be recalled and applied to different situations and contexts (Abeler & Marklein, 2017; Clark, 2002; Hossain, 2018; Thaler, 1999).

Studies suggest that when a labeling schema is created, individuals change their consumption according to the labels. Like the broader mental accounting research, numerous studies employ lab and field experiments to test the pervasiveness of labeling in mental accounting processes. Overwhelmingly, the research shows that labels impact how and why individuals allocate funds in certain ways (Abeler & Marklein, 2017; Arkes et al., 1994; Milkman & Beshears, 2009; Thaler, 2008). Perhaps one of the most important labeling methods observed is that of *earned* and *unearned* funds. Research suggests that the marginal propensity to consume unearned income is about three times larger than earned income (Christiaensen & Pan, 2010). As such, the labeling schema, and by proxy, values, and emotions associated with them, significantly impact how funds are spent.

In the case of windfalls, the labels attached to the payments may greatly influence how much of the funds are saved or spent. Public officials may label the funds as *gifts* or *bonuses* that can free up resources from tax revenues or be used for purchases that may not be included in the typical operating budget. Research suggests that grant monies often receive special treatment by public officials and may be related to labeling schemas (Mehiriz & Marceau, 2014; Stotsky, 1991). Depending on the labels attached to funds in the public purse, either formally or informally, budget-makers may be influenced in their consumption of the monies.

Emotional attachments Many of the labels created for and methods used in mental accounting processes have emotional significance. Joy, sadness, and even excitement tend to be intertwined with specific funds. The emotional attachments associated with each label in the mental

accounting system influence financial decision-making and leads decision-makers toward and away from outcomes.

Levav and McGraw (2009) found, for example, that when monetary resources possess negative feelings, people tend to avoid spending them on fun activities. Similarly, decision-makers tend to spend cash bonuses and gifts on non-essential items and *treats* (Milkman & Beshears, 2009). In both studies, the emotions that each labeled account conjures up significantly influence the decision-making process.

In a public setting, officials are likely to develop emotional attachments to funds. Tax revenue may be viewed neutrally or even negatively, while grants may be viewed positively. One such explanation could be that taxes are *imposed* upon citizens while grants are *won* by citizens. Given the distinction, budget-makers may respond by treating the funds very differently (Heyndels & Van Driessche, 1998).

Timing and Anticipation Windfall gains are spent more readily than other assets, especially when they are a surprise. Research suggests that the timing of windfall payments (e.g., seasons, landmark events, etc.), as well as anticipation of windfalls, have a significant impact on consumption patterns (Arkes et al., 1994). This occurs because temporality and anticipation influence labeling schemas within the mental accounting system. The labels generated and the emotions that are attached to them in turn change consumption patterns.

Observed non-fungibility, labels, mental accounts, emotional attachments, and the timing/anticipation of funds may help to explain why windfalls are consumed in varying proportions. If, for instance, some funds are valued less because they were gifted or granted, rather than earned, or occurred at a particular time, then consumption of those funds could be high relative to earned income. Given these observations, research from behavioral economics

could shed light on windfall payment decision-making and elucidate observed patterns in windfall consumption.

Applying Behavioral Economics to Public Finance

Despite the intense focus on the politics of budgeting in the literature, some researchers have identified and documented unique spending patterns for payments received by state and local governments from outside their borders. More specifically, they have documented a greater propensity to spend funds received from outside of the community than funds raised from within. Researchers refer to this phenomenon as the flypaper effect (Becker et al., 2020; Hines & Thaler, 1995; Sylvain Leduc & Daniel Wilson, 2017). According to the literature, payments from outside of a jurisdiction, in most cases a windfall from the federal government, are often spent at a rate much greater than taxes raised within the community receiving the payment. Such findings suggest, then, that some of the observations from behavioral economics, like non-fungibility, are particularly relevant in the public arena. Moreover, the findings intimate how and where funds are acquired matters, at least some, to public officials responsible for allocating them. However, robust studies with large datasets from which patterns can be extrapolated are scarce (Mehiriz & Marceau, 2014).

Given the lack of information on or attention to windfalls in the literature and the scant evidence regarding the flypaper effect, a turn to behavioral economics could prove helpful. The concepts discussed in the previous section, when applied to the public arena, would suggest that budget-makers may be much less revenue-agnostic than described by scholars in public budgeting, specifically, and public administration more broadly. Experiments conducted by behavioral economists contend that individuals may be very sensitive to funding sources, and

those sensitivities can influence how they allocate those funds. Therefore, it may be possible that public funds may be spent differently based on how the funds were received.

Act 13 and Applications for Windfall Payment Decision-Making

The Act 13 Unconventional Natural Gas Impact Fee was established in 2012 to offset the local costs of unconventional natural gas development in the Commonwealth. Under the law, the Public Utility Commission (PUC) assesses a yearly fee on every unconventional natural gas well in Pennsylvania. The PUC collects the funds and distributes them to the municipalities. Because the formula used to assess the fee is complex and takes many variables into account, the payment size to each municipality is often unknown.

Given the structure of the law and the distribution of the payments, the Act 13 Unconventional Natural Gas Impact Fee offered an opportunity to examine windfall payments to local governments over time. By comparing the impact fee payments disbursed by the PUC to municipalities throughout Pennsylvania, the researcher examined the relationship between payment size and savings rates. However, a brief overview of Act 13 is warranted before delving into the study.

Current Literature on Act 13 The literature on Act 13 in Pennsylvania is limited. Given the relevance of the legislation to one state, however, the dearth of work is unsurprising. Research that does examine Act 13 tends to focus on three areas. One stream examines the legislation in the context of policy responses to unconventional natural gas development in the United States and comments on legal challenges to the law. Another stream reviews the amounts received by municipalities and analyzes the spending patterns of local governments receiving the funds. The third and final stream deals with citizens' opinions of the fee and its impacts on communities.

Research on Act 13 as a policy response to unconventional natural gas development suggests that the legislation is a unique, albeit controversial, approach to regulating the industry. Studies addressing the design of Act 13 contend that it was written to maximize local benefits of the industry and minimize tax burdens on unconventional natural gas operators (Rabe & Borick, 2013). Many regard the impact fee as a middle-of-the-road approach used to ensure that revenue from the activity stayed at the local level and that operators were not subjected to a severance tax like they are in other states (Murtazashvili, 2017).

Other studies focusing on Act 13 as a policy response argue that the legislation is fraught with logistical issues (e.g., revenue has been left uncollected, disbursements have been slow, and amounts aren't known until the payments are made to municipalities). Because of its flaws, many policy experts advocated for abolishing and replacing the fee with a severance tax (Newell & Raimi, 2018; Rabe & Hampton, 2015; Weijermars, 2015). Scholars also examined the legality of the impact fee and its controversial clause, which prohibits local governments from interfering in the siting of wells through planning and zoning laws (Centner & Kostandini, 2015; Gehman et al., 2012; Jerolmack & Walker, 2018). That clause was challenged and eventually overturned by the Pennsylvania Supreme Court (J. A. Smith & Sugarman, 2014; M. F. Smith & Ferguson, 2013). Taken as a whole, the literature focused on the structure and legality of the policy provided several important details about the law but failed to elucidate how local public officials view the unconventional natural gas impact fee.

Studies on citizen opinions of Act 13 reveal that the public generally has a positive view of the fee and supports projects funded by the payments made to municipalities (Paydar et al., 2016). Furthermore, citizens see the impact fee as a necessary mechanism to ensure that unconventional natural gas development revenue stays in Pennsylvania and, more specifically,

local communities (Sica & Huber, 2017). Preference for the locally-focused payments among citizens might explain why other tax structures, like the severance tax, which is popular in other states, have not been adopted (Black et al., 2018; Weber et al., 2016). This research clarifies the impacts Act 13 has on communities, and more specifically, citizens, but does not reveal trends amongst local public officials.

The literature suggests that Act 13, while controversial in policy spheres, is quite popular among citizens of Pennsylvania. Throughout the Commonwealth, communities have benefited from the payment and used the funds to invest in important projects or saved the monies in reserve funds. The literature does not address the opinions of municipal officials, however. Views of the impact fee's structure and deliberations around allocations remain to be seen. Furthermore, little work has been done to understand how municipalities deal with the high variability of the fee and if that variability impacts budgetary planning.

Understanding Act 13 Payments Research conducted on payments from Act 13 and spending patterns of the funds revealed that the amounts collected are highly variable and that municipalities use the funds in various ways. According to the Pennsylvania Independent Fiscal Office, the complex formula used to calculate the fee is conducive to large swings in the payments received by municipalities. In some cases, payment amounts have increased or decreased by as much as 40 percent in a single year. Records show that the payments received have been invested in public infrastructure, emergency preparedness and public safety, stormwater and sewer systems, and environmental programs. Interestingly, counties and municipalities have saved approximately 39 percent of all funds and placed them in capital reserve funds for later use. Work in this arena highlights how variable the payment is and how

the monies are spent but does not address the perceptions of the public officials who receive and allocate the funds or if those perceptions influence consumption (Bushman, 2020).

Summary

State and local governments may encounter found money. Such payments may come about because of lawsuits and settlements, like the Tobacco Master Settlement Agreement or the Volkswagen Clean Air Act Civil Settlement. Typically, the amount or frequency of such payments is unknown or imprecise, which leads policymakers to perceive such payments as budgetary windfalls.

Perceiving these payments as budgetary windfalls may influence how policymakers treat them. In other words, policymakers may be inclined to spend or save these funds in a manner that is different from regular tax revenue. Research at the individual level on windfall payments suggests that individuals are generally more likely to spend windfalls that are small in proportion to income and save those that are large (Abdel-Ghany et al., 1983; James P. Keeler et al., 1985; Rucker, 1984; Tullio Jappelli & Luigi Pistaferri, 2014). Under a mental accounting model, individuals tend to place small, one-time windfall gains in a "mad money" account to spend frivolously while saving much larger windfall payments (Clark, 2002).

It is unclear if similar trends can be observed in the public setting. In short, does the literature on windfall payments to individuals help explain how states and municipalities behave in these unique circumstances? Or does the standard budgeting literature hold? This study used Act 13 Unconventional Natural Gas Impact Fee data to examine how municipalities consumed the payments. Specific attention was given to how the size of the windfall impacted decision-makers.

As windfall payments continue to impact state and local governments, understanding how policymakers treat them and allocate their funds will prove critical. This research helps to explain how those funds are perceived and what impact that perception has on allocations. Thus, this research can address public finance and budgetary problems in both theoretical and applied terms.

Chapter 3: Methodology

Research on the propensity of collective decision-making bodies to spend or save windfall payments based on their size relative to overall budgets is scarce. This study examined the relationship between windfall size and consumption patterns within Pennsylvania municipalities that received the Act 13 Unconventional Natural Gas Impact Fee payments. More specifically, the research sought to determine if municipalities in Pennsylvania were more likely to spend small windfall payments and save large windfall payments received through Act 13. Using data made available by the PUC and DCED from 2011 to 2019, the study employed a panel fixed-effect regression model and, later, a quadratic regression model to examine the relationship. Several control variables were introduced into the equation to take the population and prevailing economic conditions into account.

Statement of the Problem

Research from behavioral economics reinforces the importance of windfall size on consumption, with multiple studies suggesting that perceptions of windfalls, including payment size, are likely to influence consumption patterns (Arkes et al., 1994; Buddelmeyer & Peyton, 2014; Milkman & Beshears, 2009). The importance of windfalls and windfall size emerged and developed in the research of Friedman (1957), Bodkin (1959), Doenges (1966), Landsberger (1966), Abdel-Ghany et al. (1983), Rucker (1984), and Keeler et al. (1985). In the latter works, Rucker (1984) found that windfall size was a significant predictor of consumption patterns, while Abdel-Ghany et al. (1983) and Keeler et al. (1985) found that small windfalls received by individuals tend to be spent and large windfalls (typically valued at 50 percent of permanent income or greater) tend to be saved. Such findings directly contradicted earlier works concerning

windfalls and the permanent income hypothesis (Abdel-Ghany et al., 1983; James P. Keeler et al., 1985.

While previous research provides evidence for how individuals treat windfall payments, it does not generally examine whether collective decision-making bodies, like local or state governments, treat them differently. Despite this work, few studies on windfall payments explore whether such patterns apply in group settings. This study sought to determine if similar patterns applied in the public arena by examining payments from the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania to municipalities.

Research Question and Hypotheses

The purpose of this quantitative research study was to examine the relationship between windfall payment size and savings in the public arena. The predictor variable was windfall payment size received by municipalities, and the criterion variable was savings by the municipalities. At the measurement levels, both variables were ratio measurements. This approach assisted in answering the following research question and hypotheses:

RQ: To what extent does the relative size of a windfall payment impact savings rates?

H0: The relative size of the Act 13 payment will have no impact on savings rates.

H1: The relative size of the Act 13 payment will have a statistically significant impact on savings rates.

H2: Municipalities that receive relatively small payments will be more likely to spend the windfall than municipalities that receive relatively large payments.

Act 13 as an Analysis Study

The Act 13 Unconventional Natural Gas Impact Fee was established in 2012 to offset the local costs of unconventional natural gas development in Pennsylvania. Under the law, the PUC

assesses a fee each year on every unconventional natural gas well in the Commonwealth. The PUC collects the funds and distributes them to the municipalities. Not every municipality receives impact fee dollars; only those that host unconventional natural gas development or are adjacent to communities that host development receive the funds. There is a lag between the assessment year and disbursement to the municipalities. In other words, funds collected in 2011 are distributed in 2012, and so on.

Because the formula used to assess the fee is complex and takes many variables, including the number of wells in each locale, the age of the wells, and changes in the consumer price index into account, the payment size is often unknown by local officials. While local officials may have an idea about the amount they will receive based on the intensity of unconventional natural gas development in their communities, they generally do not have an exact figure available until after the funds have been collected by the PUC (Black et al., 2018; Bushman, 2020). Thus, the Act 13 Unconventional Natural Gas Impact Fee offers an opportunity to examine windfall payments that are, to an extent, unanticipated to local governments over time.

Under the law, every municipality (borough, township, and county) that receives payments from Act 13 must report their allocations to the Commonwealth. Those allocations are submitted to the PUC on a worksheet with 13 allocation categories. The categories are shown in Table 1 below. Completed allocation worksheets are returned to the PUC and reported online. Currently, data for the years 2011 through 2019 are available.

Table 1: Act 13 Permitted Uses

Act 13 Permitted Uses
1. Construction, reconstruction, maintenance and repair of roadways, bridges and public infrastructure.
2. Water, storm water and sewer systems, including construction, reconstruction, maintenance, and repair
3. Emergency preparedness and public safety, including law enforcement and fire services, hazardous material response, 911, equipment acquisition and other services
4. Environmental programs, including trails, parks and recreation, open space, flood plain management, conservation districts and agricultural preservation
5. Preservation and reclamation of surface and subsurface waters and water supplies
6. Tax reductions, including homestead exclusions
7. Projects to increase the availability of safe and affordable housing to residents
8. Records management, geographic information systems and information technology
9. The delivery of social services
10. Judicial services
11. Deposit into the municipality's capital reserve fund if the funds are used solely for a purpose set forth in Act 13 of 2012
12. Career and technical centers for training of workers in the oil and gas industry
13. Local or regional planning initiatives under the act of July 31, 1968 (P.L. 805, No. 247), known as the Pennsylvania Municipalities Planning Code

Of the 13 allocation categories, only one represents savings—number eleven. This category allows municipalities to save the funds in capital reserves for later use by public officials. The other 12 categories are direct expenditures by the municipality. For this study, savings are calculated using the monies allocated to the capital reserve fund.

Panel Estimation

The panel data from 2011 to 2019 were used to estimate the effects of windfall size on consumption patterns. Consumption was defined as allocations to any category other than capital reserve deposits. The inverse of consumption was savings, as represented by category number 11, or deposits into capital reserves. The following model was used in the estimation, with variables shown in municipality *m* of county *c* at time *t*:

Equation 1

$$SavingsRate = \beta_0 + \beta_1 WindfallSize_{m,c,t} + \beta_2 Unemployment_{m,c,t} + \beta_3 Income_{c,t} + \beta_4 Population_{m,c,t} + \beta_5 FinancialPosition_{m,c,t} + \varepsilon_{c,t}$$

The dependent variable in the model was the percentage of the Act 13 disbursement (windfall payment) allocated to savings. The independent variable of interest, $\beta_1$was the size of the disbursement relative to the municipal budget. The fixed effects allowed for the control of endogenous and exogenous factors that may also influence employment and income at the municipal level over time. To estimate the model in equation (1), the study used unweighted ordinary least squares regression. Similar approaches have been adopted in the public finance and windfall payment literature (Paredes et al., 2015; Weber et al., 2016).

The control variables included county-level unemployment, county-level per capita personal income, municipal population, and net revenues over expenditures reported by the municipalities. These variables controlled for possible confounding variables (e.g., fiscal retrenchment) that could be attributed to prevailing economic conditions in each municipality when windfall payment decision-making occurred (Levine et al., 1981; Stine, 1994).

Data

This study used secondary municipal- and county-level data to estimate the effects of windfall size on consumption patterns and did not require institutional review as no human subjects were involved. The data were made available by the PUC, DCED, BEA, and BLS. The independent variable, *SavingsRate*, was calculated by dividing the capital reserve fund allocation for the reporting year by the total disbursement received by the municipality. The variable captures how much of the windfall payment received by the municipality was saved rather than spent. The data for allocations were made available by the PUC.

The independent variable, *WindfallSize*, was calculated using the payment earned from Act 13 in the appropriate reporting year divided by the total annual revenue reported in the municipal budget. Total operating budgets are made available by DCED annually. Such a calculation aligns with the work of Keeler et al. (1985). In that study, researchers calculated windfall size relative to the income of individuals. Since governmental entities don't receive income, per se, the operating budgets served as the public agency equivalent.

Numerous control variables were incorporated into the model to account for possible differences associated with endogenous and exogenous factors. The control variable, *Unemployment*, was a rate made available by the Local Area Unemployment Statistics of the BLS. The BLS collects estimates of total unemployment at the county level using a definition of employment that includes temporary positions as well as those who are self-employed (Agénor, 2010; Elburz et al., 2017). Inclusion of the Local Area Unemployment Statistics was necessary to account for possible pressures placed on budget-makers during high and low unemployment.

The second control variable, *Income*, used data made available by the BEA Local Area Personal Income database. The database includes Per Capital Personal Income (PCPI) as well as

total full-time and part-time employment by industry. Both measurements are generally accepted in the literature for examining the impacts of policies or programs on employment and income; however, PCPI was chosen for this study to capture regional wage differences (Gittings & Roach, 2019; Paredes et al., 2015). Annual changes to PCPI could impact how decision-makers allocate the windfall payments within the municipality.

The control variable, *Population*, referred to the annual total population of each municipality. The population data were provided by DCED for each municipality on their respective financial reports. This variable accounted for population size and any inherent differences between more and less populated municipalities. Controlling for population allowed the model to parse out any variation between rural, suburban, and urbanized communities.

Finally, the variable *FinancialPosition* was the net revenues over expenditures reported by the municipalities on their annual reports to DCED. This variable allowed the researcher to control for any differences based on the deficit or surplus of the municipality. The inclusion of the variable addressed some of the common themes apparent in the standard budgeting literature, which discusses fiscal retrenchment extensively (Levine et al., 1981; Stine, 1994). Table 2 shows the variable definitions and sources used for the study.

Table 2: Variable Summary

Variable Name	Description	Source
SavingsRate	The percentage of the disbursement from the Act 13 payment allocated to the capital reserve fund	Spending worksheet submitted to PUC by municipalities receiving Act 13 funds
WindfallSize	The payment earned from Act 13 in the appropriate reporting year divided by the total annual revenue reported in the municipal budget	Spending worksheet submitted to PUC by municipalities receiving Act 13 funds
Unemployment	Rate of unemployment at the county level	Local Area Unemployment Statistics of the BLS
Income	Per Capita Personal Income	BEA Local Area Personal Income database
Population	Total population	Annual municipal budget report submitted to DCED by all municipalities
FinancialPosition	Net revenues over expenditures	Annual municipal budget report submitted to DCED by all municipalities

Data Analysis Procedures

The data from all sources, including BEA, BLS, DCED, and PUC were joined based on municipality name and county location using Microsoft Excel and SPSS. Once the data were joined, each municipality was constructed as a case for analysis. Wherever needed, variables were computed within SPSS. For example, the researcher computed the savings rate in the statistical package by dividing the allocation to capital reserves by the disbursement. All summary statistics were calculated, and regressions were run using SPSS

Limitations

Limitations outside of the control of the researcher existed for the study. These limitations included the accuracy of self-reported data and the possibility of missing data. The first problem, accuracy, may exist because data made available by the PUC and DCED are self-

reported by the municipalities. Therefore, the accuracy of the data is subject to the skills, abilities, and desires of the municipalities to present information accurately. Changes to budgets versus what was reported to the agencies were also probable. While there is no evidence to suggest directly that the self-reported data is inaccurate, the possibility exists, nonetheless. Furthermore, there were cases in which data were missing. For some locales in different years, data was not made available by PUC or DCED. While relatively few, these missing values inevitably impacted the model.

Summary

This study examined the relationship between windfall size and savings rates by examining Pennsylvania municipalities that received payments from Act 13. More specifically, the research sought to determine if municipalities in Pennsylvania were more likely to spend small windfall payments and save large windfall payments received through Act 13. Using data made available by PUC and DCED from 2011 to 2018, the study employed a panel fixed-effect regression model to examine the relationship. Several control variables were introduced into the equation to take the factors of location, prevailing economic conditions, and population into account. A primary advantage of the fixed-effects model was that it enabled the researcher to control for variables that differ across geographies and time (B. Smith, 2015). In this case, the fixed-effects model was used to examine windfall payments to municipalities over multiple years while controlling for a host of variables.

Chapter 4: Results

The purpose of this study was to examine the relationship between windfall size and consumption of a windfall in municipalities that received payments from Pennsylvania's Act 13 Unconventional Natural Gas Impact Fee between 2011 and 2019. Specifically, the research sought to determine if municipalities in Pennsylvania were more likely to spend small windfall payments and save large windfall payments disbursed through the statute. Using data made available by the PUC and DCED from 2011 to 2019, the study employed a panel fixed-effect regression model to examine the relationship. The research question and hypotheses were as follows:

RQ: To what extent does the relative size of a windfall payment impact savings rates?

H0: The relative size of the Act 13 payment will have no impact on savings rates.

H1: The relative size of the Act 13 payment will have a statistically significant impact on savings rates.

H2: Municipalities that receive relatively small payments will be more likely to spend the windfall than municipalities that receive relatively large payments.

To test the hypotheses, the researcher examined equation 2, shown below as a linear regression:

Equation 2

$$SavingsRate = \beta_0 + \beta_1 WindfallSize_{m,c,t} + \beta_2 Unemployment_{m,c,t} + \beta_3 Income_{c,t} + \beta_4 Population_{m,c,t} + \beta_5 FinancialPosition_{m,c,t} + \varepsilon_{c,t}$$

Then, the researcher re-estimated the relationship between payment size and spending in quadratic terms to investigate the significance of any non-linearities in the relationship between windfall size and savings.

Descriptive Statistics

Before examining the regression results, the researcher reviewed the descriptive statistics for the 2,455 observations. Outliers (any instance where the windfall size was greater than or equal to one) were excluded. The mean, standard deviation, and the number of observations for each variable are shown in Table 3.

Table 3: Descriptve Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
SavingRate	81.92	30.73	2455
WindfallSize	10.06	14.32	2455
Unemployment	6.27	1.32	2455
Income	41,438.11	6,063.328	2455
Population	2,404.38	7,075.75	2455
FinancialPosition	124,762.86	1,073,294.18	2455

On average, municipalities saved approximately 82 percent of the windfall payments, a substantial savings rate compared to the extant literature. However, the standard deviation of 30.73 indicated significant dispersion of the values. The typical payment represented about 10 percent of the municipalities' annual budgets, though again, the standard deviation of 14.32 showed considerable dispersion.

Initial Results and Linear Regression

After organizing the data into cases and excluding outliers, the researcher ran a linear regression in SPSS with the terms shown in equation (1). The results of the regression model are shown below. The model summary is shown in Table 4, and the coefficients are shown in Table 5. Collinearity statistics are displayed with the coefficients.

Table 4: Model Summary

Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.398[a]	.159	.157	28.21297	.159	92.302	5	2449	**.000**

a. Predictors: (Constant), FinancialPosition, WindfallSize, Unemployment, Income, Population

Table 5: Coefficients and Collinearity Statistics

		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	80.749	8.231		9.810	.000		
	WindfallSize	-.855	.041	-.398	-20.666	**.000**	.924	1.082
	Unemployment	.982	.579	.042	1.698	.090	.558	1.791
	Income	9.312E-5	.000	.018	.731	.465	.544	1.840
	Population	.000	.000	-.043	-1.247	.213	.284	3.526
	FinancialPosition	1.654E-6	.000	.058	1.677	.094	.290	3.452

When using only linear terms, the results suggested a statistically significant relationship between windfall payment size and savings rates (df = 5, F = 92.302, p <.001). The R-square value (.159) indicated that the model explained 15.9 percent of the variance in the savings rate.

The regression was run with the predictor variable, *WindfallSize*, and the control variables (*Unemployment*, *Income*, *Population*, and *FinancialPosition)*.

In the model, the only statistically significant variable was *WindfallSize* ($p<.001$). None of the control variables proved statistically significant. Examination of the regression coefficient revealed that the size of the windfall payment received had a statistically significant impact on the amount saved by the municipality ($B = -.398$, $t = -20.666$, $p<.001$). Based on the beta, the direction of the impact was negative ($B = -.398$). The results indicated that as the size of the windfall increased, the savings rate decreased.

Collinearity diagnostics indicated that multicollinearity was not an issue. The researcher used guidance from Pallant (2016) to examine the tolerance and Variance Inflation Factors (VIF). Pallant (2016) suggests that tolerance values >.10 and their inverse, VIF, of <10 are acceptable. None of the variables included in the model fell outside of those parameters (Pallant, 2016).

Despite the statistical significance of the model, the researcher decided to conduct a quadratic regression as a best practice. Quadratic regressions are common in the public finance and economics literature, as they reflect relationships that are parabolic in nature (Faisal et al., 2020; Heutel, 2014). Using SPSS, a second regression was run, using the square of *WindfallSize*.

Quadratic Regression

A quadratic regression was run to determine an alternative model for the data. The quadratic regression required the researcher to calculate the square of the windfall size for each municipality. The model summary, ANOVA, coefficients, and curve fit are below.

Table 6: Quadratic Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
SavingRate	81.9342	30.70737	2462
WindfallSize	10.0491796	14.32337997	2462
Windfallsize2	306.0619	745.79652	2462

Table 7: Quadratic Model Summary

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.452	.204	.204	27.402

The independent variable is WindfallSize.

Table 8: Quadratic ANOVA

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	474243.945	2	237121.973	315.805	.000
Residual	1846337.751	2459	750.849		
Total	2320581.696	2461			

The independent variable is WindfallSize.

Table 9: Quadratic Coeficients

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
WindfallSize	-2.020	.104	-.942	-19.355	**.000**
WindfallSize^2	.024	.002	.587	12.061	**.000**
(Constant)	94.834	.765		123.933	.000

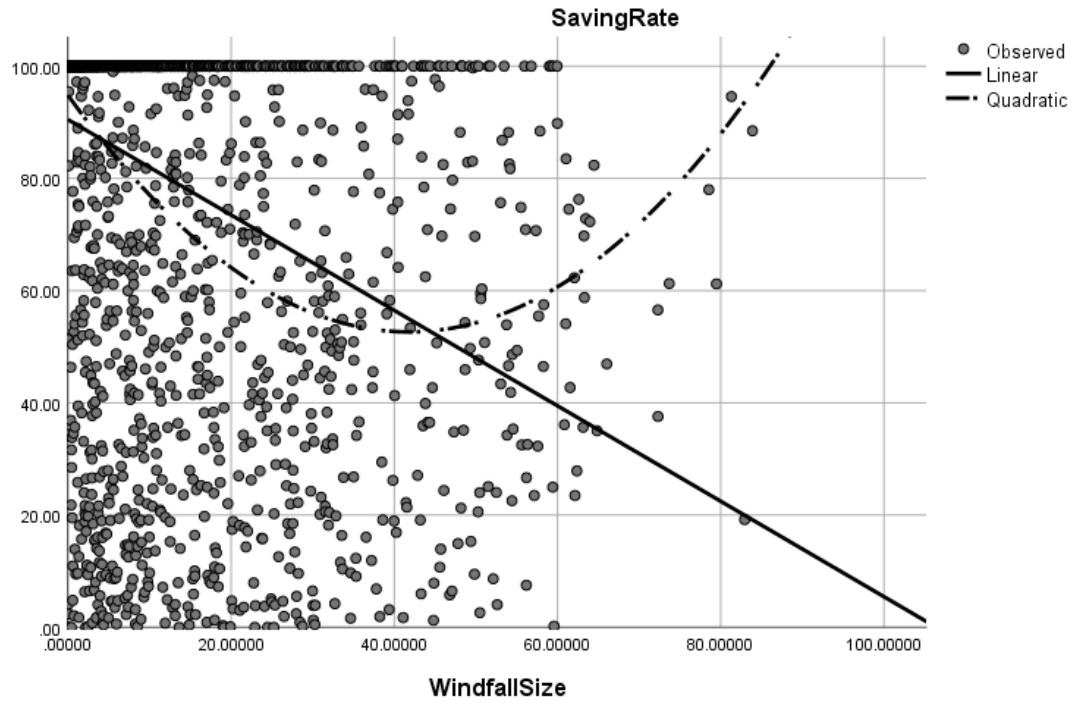

Figure 1: Curve Fit

When using quadratic terms, the results suggested that, again, a statistically significant relationship between windfall payment size and the savings rate existed (df = 2, F = 315.805, p <.001). The R-square value increased (.204) and indicated that 20.4 percent of the variance in the savings rate was explained by the model. The regression was run with the predictor variable, *WindfallSize*, and none of the control variables since the controls proved statistically insignificant in the linear model. The quadratic term of *WindfallSize* was statistically significant (B = .024, t = 12.061, p<.001).

The curve fit (Figure 1) shows the difference between the linear and quadratic regressions. While the line of best fit for the linear regression was negative, the quadratic regression indicated a minimum in the parabola, at which point the savings rate began to increase. To solve for this minimum, the researcher used the following equation:

Equation 3

$$Vertex, (h, k) = \left(\frac{-b}{2a}, \frac{-\Delta}{4a}\right)$$

Where $\Delta = b^2 - 4ac$

Solving the equation yielded coordinates for the minimum (42.083, 48.22). The coordinates of the minimum suggested that as the windfall size reached 42.08 percent of the municipal budget, the savings rate reached a minimum of 48.22 percent and then increased. Rather than the strictly negative relationship observed in the linear regression, the quadratic regression suggested that the savings rate decreased before increasing.

Answering the Research Question and Addressing the Hypotheses

The study examined the relationship between windfall size and consumption of a windfall in municipalities that received payments from the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania between 2011 and 2019. In addition, the research also sought to determine if municipalities in Pennsylvania were more likely to spend small windfall payments and save large windfall payments received through the statute. Using data made available by PUC and DCED from 2011 to 2019, the study employed a panel fixed-effect regression model to examine the relationship.

After running linear and quadratic regressions, the researcher concluded that the size of the Act 13 payment is a predictor of windfall savings. As for the direction of the relationship between windfall size and savings, the linear regression showed a negative relationship—as windfall size increased, savings rates decreased. The results of the quadratic regression, however, suggested that municipalities saved small windfalls at a decreasing rate until the windfall size reached about 42 percent of the municipal budget. After that point, municipalities saved the windfall at an increasing rate.

The nuances identified by the quadratic regression provided interesting insights for the study. The parabola shown by the equation suggests that the relationship between windfall size and savings rate is even more complex than previously thought. Given the minimum of the parabola, there appears to be a point at which public officials treat the windfalls differently, which in turn influences savings rates. Such a finding illustrates the complexity of the relationship and provides direction for future studies.

Summary

This chapter presented the results of two regressions run as a part of an analysis of the relationship between windfall payment size and savings rates. The first regression was linear and showed a statistically significant negative relationship between the independent (windfall size) and dependent (savings rate) variables. The second regression was quadratic and showed a statistically significant relationship between the independent and dependent variables. The R-square value in the quadratic model was higher than in the linear model, at .204 and .159, respectively. These results suggest that the relationship between windfall payment size and savings rates is parabolic, with savings reaching a minimum where the payment size is 42.08 percent of the municipal budget and the savings rate is 48.22 percent of the payment received. The next chapter will discuss the findings further and provide additional information about the significance of the study.

Chapter 5: Discussion

Research on windfall payments completed before this study indicates that when individuals receive found or unanticipated funds, they are more inclined to spend small amounts and save large ones. Scholars suggest this is the case because the small amounts may be perceived as a type of *mad money* that is spent more easily than large sums (Arkes et al., 1994; Milkman & Beshears, 2009; Rucker, 1984). Building off that scholarship, this study sought to determine if the same patterns could be observed in the public setting. Using disbursement data from the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania, the researcher examined whether the size of the windfall impacted how much of the payment was saved or spent by budget-makers.

The study results showed a complex relationship between windfall payment size and savings rates. Rather than a positive correlation, whereby savings rates increased as windfall size increased, a parabolic relationship was observed. Municipalities tended to save the funds at a decreasing rate until reaching a minimum. Located at the coordinates (x= 42.08, y= 48.22), the minimum suggested that as the windfall size reached 42.08 percent of the municipal budget, the savings rate reached a low of 48.22 percent and then increased at an increasing rate. These findings bolster arguments by economists that consumption is not purely a function of permanent income (Bodkin, 1959; Joseph P. DeJuan & John J. Seater, 2006). Furthermore, the study applied current research to the public arena, an application that is scarce in the literature.

This chapter will discuss the findings and situate them in the context of the extant literature. Following that discussion, the researcher will discuss the implications of the results in the field of public administration. Next, the researcher will discuss the limitations of the study.

The chapter will close with a brief discussion on future research and new directions for the public budgeting literature.

Study and Findings

The study examined the relationship between windfall payment size and savings in the public arena. Using secondary municipal- and county-level data made available by PUC, DCED, BEA, and BLS, the study estimated the effects of windfall size on savings patterns. The independent variable, *SavingsRate*, was calculated by dividing the capital reserve fund allocation for the reporting year by the total disbursement received by the municipality. The independent variable, *WindfallSize*, was calculated using the payment earned from Act 13 in the appropriate reporting year divided by the total annual revenue reported in the municipal budget.

Numerous control variables were incorporated into the model to account for possible differences associated with endogenous and exogenous factors. The control variable, *Unemployment*, was a rate made available by the Local Area Unemployment Statistics of the BLS. Inclusion of the Local Area Unemployment Statistics was necessary to account for possible pressures placed on budget-makers during high and low unemployment.

The second control variable, *Income*, used data made available by the BEA Local Area Personal Income database. The database includes Per Capital Personal Income (PCPI) as well as total full-time and part-time employment by industry. Annual changes to PCPI were expected to influence how decision-makers allocate the windfall payments within the municipality.

The population data were provided by DCED for each municipality on their financial reports. The variable *Population* controlled for the annual total population of each municipality. This variable accounted for population size and any inherent differences between more and less

populated municipalities. Controlling for population allowed the model to parse out any variation between rural, suburban, and urbanized communities (Whitaker et al., 2011).

Finally, the variable *FinancialPosition* was the net revenues over expenditures reported by the municipalities on their annual reports to DCED. This variable allowed the researcher to control for any differences based on the deficit or surplus of the municipality. The inclusion of the variable addressed some of the common themes apparent in the standard budgeting literature, which discusses fiscal retrenchment extensively (Levine et al., 1981; Stine, 1994).

After organizing the data into cases and excluding outliers (any instance where the windfall size was greater than or equal to one), the researcher ran a linear regression in SPSS. When using only linear terms, the results suggested a statistically significant relationship between windfall payment size and the savings rate ($df = 5$, $F = 92.302$, $p < .001$). The R-square value (.159) indicated that 15.9 percent of the variance in the savings rate was explained by the model. The regression was run with the independent variable, *WindfallSize*, the dependent variable, *SavingsRate*, and the control variables (*Unemployment*, *Income*, *Population*, and *FinancialPosition)*.

After running the model, the only statistically significant variable was *WindfallSize* ($p<.001$). None of the control variables proved statistically significant. Examination of the regression coefficient revealed that the size of the windfall payment received had a statistically significant impact on the amount saved by the municipality ($B = -.398$, $t = -20.666$, $p<.001$). The direction of the impact was negative ($B = -.398$). The results indicated that as the size of the windfall increased, the savings rate decreased.

The researcher examined the data for curvilinear relationships, interaction effects, and lines of best fit. After analyzing the data, the researcher ran a quadratic regression, given the

possibility of a curvilinear relationship. When using quadratic terms, the results suggested that a statistically significant relationship between windfall payment size and the savings rate existed ($df = 2$, $F = 315.805$, $p < .001$). The R-square value increased (.204) and indicated that 20.4 percent of the variance in the savings rate was explained by the model. The regression was run with the predictor variable, *WindfallSize*, and none of the control variables since none of the controls proved statistically significant in the linear model. The quadratic term of *WindfallSize* was statistically significant ($B = .024$, $t = 12.061$, $p < .001$).

After running linear and quadratic regressions, the researcher concluded that the size of the Act 13 payment was a predictor of windfall savings. Thus, the null hypothesis, that windfall payment size had no impact on savings rates, was rejected. The second hypothesis of the study, that payment size and savings rates were positively correlated, was partially rejected and partially accepted. The result of the quadratic regression suggested that municipalities saved small windfalls at a decreasing rate until the windfall size reached about 42 percent of the municipal budget. After that point, municipalities saved the windfall at an increasing rate.

Explanation of Results

The study results show a complex relationship between windfall payment size and savings rates in Pennsylvania municipalities that received disbursements from the Act 13 Unconventional Natural Gas Impact Fee. While the linear regression indicated a negative correlation between windfall size and savings, the quadratic regression indicated a parabolic correlation. Neither model showed that the control variables, which represented factors identified in the traditional budgeting literature, were statistically significant. The results suggested that windfall payment size is predictive of savings rates in Pennsylvania municipalities.

Linear Regression The observed negative relationship between windfall size and savings rates was unexpected given the extant literature. Previous research suggested that windfall payment size and savings rates were positively correlated (Abdel-Ghany et al., 1983; James P. Keeler et al., 1985). The results of this study suggested the opposite. One possible explanation for this finding is how unconventional natural gas development impacts communities and the costs that local governments incur during extraction. Because of these costs, spending may be higher in communities that received large payments as those communities were likely to have the most unconventional natural gas development. Conversely, communities with relatively small payments may have saved the funds because they did not have as many costs or externalities from unconventional natural gas development.

The economic, environmental, governmental, and infrastructural costs associated with the industry are well-documented in the literature (Clough, 2018; Haikola & Anshelm, 2019; Ouedraogo, 2016; Paredes et al., 2015; M. F. Smith & Ferguson, 2013; Tsvetkova & Partridge, 2016). Some of the most common complaints at the local government level include damage to roads and bridges and stress on local services, like police and fire protection. Roads and bridges often get damaged during the transport of heavy equipment used at the well pads, while strains on local services appear because of the influx of workers to the area of extraction (Hinton, 2018; Lim, 2018; Murphy et al., 2018). Because of these costs, jurisdictions with heavy development may have chosen to spend rather than save the Act 13 funds as they incurred more costs over time.

In fact, the Act 13 Unconventional Natural Gas Impact Fee was established for precisely this reason. Lawmakers intended for the monies to offset the costs associated with unconventional natural gas development in municipalities across Pennsylvania. Given these costs

and the intent of the fee in mind, it is possible that the municipalities used the funds to mitigate the impacts of the industry. This explanation addresses the negative, linear relationship observed.

Quadratic Regression The quadratic regression yields a different result from the linear model. Rather than a strictly negative correlation between windfall payment size and savings rates, the quadratic regression showed a positive parabolic relationship between the two variables. Research from Rucker (1984) helps to explain this relationship. Rucker (1984) argues that while windfall payment size and consumption are related, there are certain points or sizes at which consumption changes dramatically. Using her logic, the minimum of the curve in the quadratic model may represent that point.

According to Rucker (1984), who examined windfall payment decision-making among university employees who received retroactive pay increases, a windfall must be sufficiently large for consumption patterns to be impacted. She found that the windfall payment had to reach $230 before individuals in her study identified a specific use for the funds (Rucker, 1984). At that point, recipients of the windfall shifted their spending patterns from current expenses and debts to allocations toward new expenses.

Borrowing from Rucker (1984), the researcher contends that the minimum of the parabola represents a point where public officials significantly changed their behavior. Such an argument may explain why many small payments from Act 13 were allocated to savings rather than immediate expenditures. In many cases, the municipalities may not have found the small amounts to be worth the trouble of allocating for specific expenditures on the reporting form provided by PUC. As a result, they tended to save more of the funds, at least initially, in the capital reserve category provided on the Act 13 allocation reporting. From there, savings

decreased until hitting the minimum. At the higher payment sizes, public officials resumed saving the monies as they contemplated how to spend the more significant sums.

The notion of manageability, stewardship, and strategic use of revenue from a windfall payments appears in the resource extraction literature. Numerous studies on permanent and legacy funds established from natural resource extraction revenue exist (Andersen & Hjortskov, 2016; Bishop, 2014; Kozminski & Baek, 2017; Rabe & Hampton, 2015). These studies suggest that jurisdictions with vast reserves of natural gas extraction often view windfalls from the resource as a strategic way to invest in their communities and prepare for possible downturns in the future. It is possible that the municipalities felt the same way about the funds when the disbursements received were sufficiently large.

The findings from Rucker (1984), paired with the resource extraction literature findings, offer a reasonable explanation for the curvilinear relationship between payment size and savings rates. Very small windfalls are saved because they are perceived neither as important nor meaningful increases in revenue. At the opposite end of the spectrum, very large windfalls are also saved. However, they are saved because they are viewed as important and meaningful increases in revenue that may require additional thought or planning.

Study Findings and the Current Literature

Unlike the traditional literature on the politics of budgeting, emerging research suggests that the perception of windfall payments in state and local government settings may influence how budget-makers treat them (Basili et al., 2008; Heyndels & Van Driessche, 1998; Mehiriz & Marceau, 2014). Public officials may be inclined to spend or save the funds in a manner that is different from endogenous taxes or fees because the funds present an opportunity to depart from typical budgeting processes (Heyndels & Van Driessche, 1998). The literature from behavioral

economics contends that this is so because budgetary decision-makers may be highly influenced by mental accounting methods when dealing with such payments, and as result, treat the funds as a bonus or gift (Levav & Mcgraw, 2009; Thaler, 2008). As such, public officials may spend rather than save windfalls based on a myriad of factors that are absent from the traditional literature on public finance and budgeting.

One of the factors impacting the consumption of windfalls is windfall size. Numerous studies spanning several decades suggest that windfall payment size impacts consumption patterns. Using data from 598 households in Boulder, Colorado, that received various windfall incomes, Doenges (1966) found that larger payments tended to be saved and smaller ones spent. Similarly, Abdel-Ghany (1983) found that the marginal propensity to consume regular income was greater than the marginal propensity to consume windfall income for payments that were large relative to regular income. In an analysis of retroactive payments made to university employees, Rucker (1984) found that the size of a windfall was the most critical discriminator concerning windfall savings. Using data from the 1972 consumer expenditure survey, Keeler et al. (1985) also found that the marginal propensity to consume a windfall decreased as the relative size of the payment increased. In each of these studies, the researchers showed that some level of consumption of windfall payments tended to occur and that the size of the windfall impacted consumption (Abdel-Ghany et al., 1983; Doenges, 1966; James P. Keeler et al., 1985).

Most recently, scholars have found mixed effects on windfall payment size. Japelli & Pistaferri (2014) examined the marginal propensity to consume using the Survey Household Income and Wealth (SHIW) conducted in 2010 by Banca di Italia. In that survey, the researchers found that respondents consumed about 48 percent of windfall gains (Tullio Jappelli & Luigi Pistaferri, 2014). Similarly, Drescher et al. (2020) found a high level of consumption in survey

data from across Europe. Using data from the Eurosystem Household Finance and Consumption Survey (HFCS), the researchers found that households, on average, spent between 33% (the Netherlands) and 57% (Lithuania) of such a windfall payment. Although, a wide range of consumption was observed from country to country (Drescher et al., 2020).

This study contributed to the body of work by applying various concepts and theories to the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania. As such, the study advanced the literature in several ways. First, the study results offered further evidence that transitory income and consumption are correlated. This finding contradicted Friedman's (1957) contention that transitory income does not give rise to consumption and that individuals are much more likely to consume based on their permanent income rather than their transitory income. With this additional evidence in mind, the literature should work to identify the nuances in decision-making processes rather than continue to debate the fundamental relationship between permanent income, transitory income, and consumption.

Second, the research contended that windfall payment size is a crucial discriminator in windfall consumption. Like Rucker (1984) and others, the researcher showed that windfall payment size significantly impacted consumption patterns. Even with the inclusion of multiple control variables, windfall payment size still proved most valuable in understanding how windfall recipients spent or saved the funds.

Third, the study showed a curvilinear relationship between windfall size and savings rates as well as a parabolic minimum, which is largely absent from the literature. While other studies attempted to determine the point at which windfall recipients shift from spending to saving and vice versa, few works examined the relationship in quadratic terms. Evaluating the relationship using a quadratic expression offered an alternative path for future analysis.

Finally, the study provided a novel application of behavioral economics to the public sector. At the time of this publication, few works attempted to evaluate behavioral influences in state and local government finance. This work offered an application to public finance broadly and windfall payment decision-making specifically. The results suggested that more work should be done, as the traditional public budgeting literature proved unhelpful in explaining the consumption of the Act 13 funds.

Implications for Public Administration

As state and local governments continue to receive stimulus payments, cash settlements, and exogenous fees or rebates, understanding the relationship between windfall payments and consumption becomes more relevant. Public administrators should understand how budget-makers treat windfall payments and if the budgeting processes for windfall payments are different from standard revenue streams. In addition, policymakers and officials granting the funds should understand how windfall size can alter the intended outcomes or effects of the payment. This study addressed this critical issue by examining windfall payments received by local governments and offers some insights for public administrators.

Concerning the recipients of windfalls, the study results indicated that budgeting politics are not the only factors influencing windfall payment decision-making. Instead, behavioral influences, like perceptions of the payment, including relative size, may also be at play. The study showed that windfall size was the most important factor determining how much of the payments were saved and spent. Thus, entities receiving windfall payments should be cognizant of personal perceptions and address potential cognitive biases in the decision-making process.

Likewise, policymakers and grantors of exogenous payments should recognize that windfall size is an essential consumption indicator. Thus, officials who wish to provide monetary

support to public entities should carefully consider payment size, as it can undermine the intent of the payment. If the desired outcome of a windfall payment is to stimulate spending, for example, then payments that are too small or too large could prove detrimental since officials are more inclined to save them. Conversely, if the intent of the payment is to establish a trust or legacy fund that will provide support into the future, then the payment should be substantial so that recipients will evaluate the funds and their uses more carefully.

Study Validity

The researcher considered internal and external validity throughout the research process. Internal validity refers to the structure of the design, while external validity refers to the applicability or generalizability of the study overall (G. Johnson, 2014). The researcher attempted to avoid or mitigate typical threats for both. For this study, external validity issues were more significant than those for internal validity.

Johnson (2014) identifies several threats to internal validity, including history, maturation, testing, instrumentation, regression to the mean, selection, sampling, and attrition. Because the study was quantitative and analyzed disbursements from the Act 13 Unconventional Natural Gas Impact Fee to municipalities in Pennsylvania, many of these threats were avoided. The researcher included all municipal recipients for every year of available data since the fee was established. Consequently, the study was comprehensive in its analysis of Pennsylvania's municipalities and avoided issues regarding sampling and populations. Additional internal validity concerns proved irrelevant given the use of secondary data reported by state and federal agencies (Druckman et al., 2011).

As for external validity, the primary threat was the study's focus on one particular state. While the study was comprehensive in its approach to the population of interest in Pennsylvania,

the patterns observed may be unique to that state. Therefore, the scope of the study was limited, and the results may not be generalizable to other populations. However, such an issue is not uncommon and regularly appears in the public policy and public administration literature (G. Johnson, 2014).

Limitations and Delimitations

All research has delimitations and limitations. Delimitations are choices or parameters established by the researcher, while limitations are factors that are outside of the researcher's control. A discussion of both is necessary as they impact the applicability and generalizability of the results. In this study, the researcher identified two major delimitations and limitations.

The study's exclusive focus on Pennsylvania and its municipalities was the first delimitation. Indeed, many other states and municipalities receive windfall payments that differ significantly in size and structure from those disbursed through the Act 13 Unconventional Natural Gas Impact Fee. Therefore, the findings may be exclusive to Pennsylvania and may not elucidate trends in other locales. The second delimitation was the researcher's employment of quantitative techniques only. No surveys, interviews, or other qualitative methods were included in the design of the study. The inclusion of qualitative measures could have enriched the study by providing context or reasoning for local public officials' decisions.

Limitations of this study included the accuracy of self-reported data and the possibility of missing data. The first problem, accuracy, may exist because data made available by the PUC and DCED are self-reported by the municipalities. Therefore, the accuracy of the data was subject to the municipalities' skills, abilities, and desires to present information accurately. Changes to budgets versus what was reported to the agencies were also probable. While there is

no evidence to suggest directly that the self-reported data was inaccurate, the possibility exists, nonetheless.

Furthermore, there were cases in which data were missing. For some locales in specific years, data was not made available by the PUC or DCED. There were fewer than 50 missing observations between 2011 and 2019. While relatively small, these missing values inevitably impacted the model.

The delimitations and limitations addressed are not uncommon in the literature (Druckman et al., 2011). Inevitably, the researcher must limit the scope of the study and cannot adopt a completely exhaustive research methodology. Similar studies on windfall payments have adopted exclusively quantitative methods. Therefore, the parameters of this study were typical for this stream of research.

Future Research

The findings of this study provide several directions for future research. Some of these directions pertain to Act 13 specifically, while others more broadly pertain to windfall payments and behavioral public finance. In both cases, additional or alternative methods may be needed to expound the trends identified. This section will discuss both the specific and broad directions for future research.

Act 13 Research In the future, additional work should be completed to understand the views and opinions of decision-makers who allocate funds from Act 13. A survey instrument could be beneficial in this endeavor. Survey data may illustrate how budget-makers feel about the funds and reporting requirements, if the size of the payment proved worthwhile or manageable, and if feelings of stewardship or strategic management impacted their decision-making. Such findings

could support or reject some of the conjectures of the researcher pertaining to the curvilinear relationship between payment size and savings rates in the context of Act 13

Additionally, future work should examine whether the monies disbursed through Act 13 have long-term community impacts. Further analysis could identify, for example, if the funds adequately address the externalities of development by covering the costs incurred by local governments. This research could help lawmakers determine whether the statute should be modified in the future.

Windfall Payment Decision-Making and Behavioral Public Finance In terms of windfall payments, future research should address how public officials perceive them and if those perceptions impact their decision-making. Given the body of literature on fungibility, mental accounting methods, and labels, research should evaluate whether those theories apply to windfall payments at the state and local government levels. Again, survey research could prove helpful in this area. Alternatively, interviews or focus groups with public officials could help elucidate attitudes toward and perceptions of windfall payments.

Apart from windfall payments, more work applying behavioral economics to public finance is needed. This study highlights the applicability of the field to budgeting and allocations. But many other applications exist. Current research appears to be heading in this direction, wither numerous researchers examining behavior in the public arena (Espinosa et al., 2021). Some of the more pressing questions revolve around the timing and anticipation of funds.

The issue of timing and anticipation could be explored by comparing windfall payments and their lead times. In the case of legal settlements, for example, news coverage of the court cases could influence consumption patterns since budget-makers have a more extended period to debate potential expenditures. The consumption patterns observed in those cases could be

compared to other windfalls that have very short lead times or are entirely unanticipated. Such work could show additional utility for insights from behavioral economics.

Summary

The study sought to determine if a relationship between windfall size and consumption of a windfall existed by examining municipalities that received payments from the Act 13 Unconventional Natural Gas Impact Fee in Pennsylvania between 2011 and 2019. In addition, the research also sought to determine if municipalities in Pennsylvania were more likely to spend small windfall payments and save large windfall payments received through the statute. Using data made available by BEA, BLS, PUC, and DCED from 2011 to 2019, the study employed a panel fixed-effect regression model and a quadratic regression model to examine the relationship.

The linear regression model showed a statistically significant negative relationship between the independent (windfall size) and dependent (savings rate) variables. The quadratic regression showed a statistically significant relationship between the independent and dependent variables. The R-square value in the quadratic model was higher than in the linear model, at .204 and .159, respectively. These results suggested that the relationship between windfall payment size and savings rates was parabolic in, with the savings rates reaching a minimum at 48.22 percent when the payment size was 42.08 percent of the municipal budget. In both models, windfall size was the only statistically significant predictor of savings.

The results suggested that critical breaking points existed along the curve for determining consumption patterns of the disbursements. Payments must be sufficiently large for expenditures to take place but not so large that the payments become unmanageable. Such results build off the

work of other researchers in the field and indicate the importance of alternative analyses of windfall payment decision-making.

More work should be done to examine the thoughts, opinions, and motives of decision-makers who receive windfall payments. Since windfall payment size proved impactful in this study, other cognitive factors likely influence budgetary decision-making as well. Understanding these factors will help recipients of windfalls make better choices and grantors of windfalls become more strategic in their disbursement of monies.

Additionally, greater attention should be given to applying behavioral economics concepts to public budgeting and administration. While the politics of budgeting literature has dominated for many years, this study and others show that other factors influence budget-making. However, more work needs to be done to determine how and why behavioral factors influence budget-making in the public arena.

References

Abdel-Ghany, M., Bivens, G. E., Keeler, J. P., & James, W. L. (1983). Windfall Income and the Permanent Income Hypothesis: New Evidence. *Journal of Consumer Affairs*, *17*(2), 262–276. https://doi.org/10.1111/j.1745-6606.1983.tb00303.x

Abeler, J., & Marklein, F. (2017). Fungibility, Labels, and Consumption. *Journal of the European Economic Association*, *15*(1), 99–127. https://doi.org/10.1093/jeea/jvw007

Agénor, P.-R. (2010). A theory of infrastructure-led development. *Journal of Economic Dynamics and Control*, *34*(5), 932–950. https://doi.org/10.1016/j.jedc.2010.01.009

Ahrens, T., & Ferry, L. (2018). Institutional entrepreneurship, practice memory, and cultural memory: Choice and creativity in the pursuit of endogenous change of local authority budgeting. *Management Accounting Research*, *38*, 12–21. https://doi.org/10.1016/j.mar.2016.11.001

Andersen, S. C., & Hjortskov, M. (2016). Cognitive Biases in Performance Evaluations. *Journal of Public Administration Research & Theory*, *26*(4), 647.

Anessi-Pessina, E., & Sicilia, M. (2015). Biased Budgeting in the Public Sector: Evidence from Italian Local Governments. *Local Government Studies*, *41*(6), 819–840. https://doi.org/10.1080/03003930.2015.1012194

Aragon, L., & Casale, M. (2017). *From Deceit to Transformation: How States Can Leverage Volkswagen Settlement Funds to Accelerate Progress To a Clean Transportation System*. https://trid.trb.org/View/1474081

Arkes, H. R., Joyner, C. A., Pezzo, M. V., Nash, J. G., Siegel-Jacobs, K., & Stone, E. (1994). The Psychology of Windfall Gains. *Organizational Behavior and Human Decision Processes*, *59*(3), 331–347. https://doi.org/10.1006/obhd.1994.1063

Basili, M., Chateauneuf, A., & Fontini, F. (2008). Precautionary principle as a rule of choice with optimism on windfall gains and pessimism on catastrophic losses. *Ecological Economics*, *67*(3), 485–491. https://doi.org/10.1016/j.ecolecon.2007.12.030

Becker, J., Hopp, D., & Kriebel, M. (2020). Mental accounting of public funds – The flypaper effect in the lab. *Journal of Economic Behavior & Organization*, *176*, 321–336. https://doi.org/10.1016/j.jebo.2020.04.026

Berset, S., & Schelker, M. (2020). Fiscal windfall curse. *European Economic Review*, *130*, 103592. https://doi.org/10.1016/j.euroecorev.2020.103592

Bishop, T. R. (2014). Looking "North to the Future": Modeling Pennsylvania's Development of Natural Gas on Alaska's Permanent Fund Dividend. *Widener Law Journal*, *23*(3), 813–842.

Black, K. J., McCoy, S. J., & Weber, J. G. (2018). When Externalities Are Taxed: The Effects and Incidence of Pennsylvania's Impact Fee on Shale Gas Wells. *Journal of the Association of Environmental & Resource Economists*, *5*(1), 107.

Blom-Hansen, J., Bækgaard, M., & Serritzlew, S. (2014). Tax Limitations and Revenue Shifting Strategies in Local Government. *Public Budgeting & Finance*, *34*(1), 64–84. https://doi.org/10.1111/pbaf.12029

Bodkin, R. (1959). Windfall Income and Consumption. *American Economic Review*, *49*(4), 602–614.

Buddelmeyer, H., & Peyton, K. (2014). How Windfall Income Increases Gambling at Poker Machines. *Economic Record*, *90*(289), 236–248. https://doi.org/10.1111/1475-4932.12094

Bushman, J. (2020). *Pennsylvania Impact Fee and Natural Gas Trends*. 15.

Caiden, N. (1985). The Boundaries of Public Budgeting: Issues for Education in Tumultuous Times. *Public Administration Review*, *45*(4), 495. https://doi.org/10.2307/3110034

Centner, T. J., & Kostandini, G. (2015). Local governments want authority to address problems: The case of horizontal drilling and hydraulic fracturing in the United States. *Land Use Policy*, *49*, 227–235. https://doi.org/10.1016/j.landusepol.2015.08.012

Christiaensen, L., & Pan, L. (2010). *Transfers and development: Easy come, easy go?* (Working Paper No. 2010/125). WIDER Working Paper. https://www.econstor.eu/handle/10419/53976

Clark, J. (2002). House Money Effects in Public Good Experiments. *Experimental Economics*, *5*(3), 223.

Clemens, J., & Veuger, S. (2020). Implications of the covid-19 pandemic for state government tax revenues. *National Tax Journal*, *73*(3), 619–644. https://doi.org/10.17310/ntj.2020.3.01

Clough, E. (2018). Environmental justice and fracking: A review. *Current Opinion in Environmental Science & Health*, *3*, 14–18. https://doi.org/10.1016/j.coesh.2018.02.005

David D. Laitin & Aaron Wildavsky. (1988). Political Culture and Political Preferences. *The American Political Science Review*, *82*(2), 589–597. https://doi.org/10.2307/1957403

Doenges, R. C. (1966). Transitory Income Size and Savings. *Southern Economic Journal*, *33*(2), 258–263. https://doi.org/10.2307/1055393

Drescher, K., Fessler, P., & Lindner, P. (2020). Helicopter Money in Europe: New Evidence on the Marginal Propensity to Consume across European Households. *Working Papers (Oesterreichische Nationalbank)*, *231*, 1–14.

Druckman, J. N., Greene, D. P., Kuklinski, J. H., & Lupia, A. (2011). *Cambridge Handbook of Experimental Political Science*. Cambridge University Press.

Elburz, Z., Nijkamp, P., & Pels, E. (2017). Public infrastructure and regional growth: Lessons from meta-analysis. *Journal of Transport Geography*, *58*, 1–8. https://doi.org/10.1016/j.jtrangeo.2016.10.013

Epley, N., & Gneezy, A. (2007). The framing of financial windfalls and implications for public policy. *The Journal of Socio-Economics*, *36*(1), 36–47. https://doi.org/10.1016/j.socec.2005.12.012

Epley, N., Mak, D., & Idson, L. C. (2006). Bonus of rebate?: The impact of income framing on spending and saving. *Journal of Behavioral Decision Making*, *19*(3), 213–227. https://doi.org/10.1002/bdm.519

Espinosa, S., Kriz, K. A., & (Wie) Yusuf, J.-E. (2021). Behavioral Public Finance and Budgeting: New Approaches to Old Questions? *Public Finance & Management*, *20*(1), 1–10.

Faisal, Majid, M. S. Abd., & Sakir, A. (2020). Determining Ownership Structure Threshold as a Basis for Financial Decision Making: A Panel Quadratic Regression Model. *2020 International Conference on Decision Aid Sciences and Application (DASA)*, 437–441. https://doi.org/10.1109/DASA51403.2020.9317230

Friedman, M. (1957). The Permanent Income Hypothesis. In *A Theory of the Consumption Function* (pp. 20–37). Princeton University Press. https://www.nber.org/books-and-chapters/theory-consumption-function/permanent-income-hypothesis

Friedman, M. (1958). The Permanent Income Hypothesis: Comment. *American Economic Review*, *48*(5), 990.

Friedman, M. (2018). *Theory of the Consumption Function*. Princeton University Press. https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=edsjbk&AN=edsjbk.j.ctv39x7zh&site=eds-live&custid=s9006354

Gehman, J., Mastroianni, D., Grant, A., & Etzion, D. (2012). RESEARCH ARTICLE: An Analysis of Unconventional Gas Well Reporting under Pennsylvania's Act 13 of 2012. *Environmental Practice*, *14*(4), 262.

Graham, S. R., & Makowsky, M. D. (2021). Local Government Dependence on Criminal Justice Revenue and Emerging Constraints. *Annual Review of Criminology*, *4*(1), 311–330. https://doi.org/10.1146/annurev-criminol-061020-021824

Haikola, S., & Anshelm, J. (2019). Evolutionary governance in mining: Boom and bust in peripheral communities in Sweden. *Land Use Policy*, 104056. https://doi.org/10.1016/j.landusepol.2019.104056

Heutel, G. (2014). Crowding Out and Crowding In of Private Donations and Government Grants. *Public Finance Review*, *42*(2), 143–175. https://doi.org/10.1177/1091142112447525

Heyndels, B., & Van Driessche, F. (1998). Mental accounting in local public sector budgeting: An empirical analysis for the flemish municipalities. *Eastern Economic Journal*, *24*(4), 381.

Heyndels, B., & Van Driessche, F. (2002). How municipalities react to budgetary windfalls. *Economics of Governance*, *3*(3), 211. https://doi.org/10.1007/s101010100040

Hines, J. R., & Thaler, R. H. (1995). The Flypaper Effect. *Journal of Economic Perspectives*, *9*(4), 217–226. https://doi.org/10.1257/jep.9.4.217

Hinton, D. D. (2018). *Shale Boom: The Barnett Shale Play and Fort Worth*. Texas Christian University Press.

https://libproxy.washjeff.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2106532&site=eds-live

Hossain, M. T. (2018). How Cognitive Style Influences the Mental Accounting System: Role of Analytic versus Holistic Thinking. *Journal of Consumer Research*, *45*(3), 615–632. https://doi.org/10.1093/jcr/ucy020

James P. Keeler, William L. James, & Mohamed Abdel-Ghany. (1985). The Relative Size of Windfall Income and the Permanent Income Hypothesis. *Journal of Business & Economic Statistics*, *3*(3), 209–215. https://doi.org/10.2307/1391591

Jerolmack, C., & Walker, E. T. (2018). Please in My Backyard: Quiet Mobilization in Support of Fracking in an Appalachian Community. *American Journal of Sociology*, *124*(2), 479–516. https://doi.org/10.1086/698215

John B. Gilmour & David E. Lewis. (2006). Assessing Performance Budgeting at OMB: The Influence of Politics, Performance, and Program Size. *Journal of Public Administration Research and Theory: J-PART*, *16*(2), 169.

Johnson, C. L. (2004). The State of the Tobacco Settlement: Are Settlement Funds Being Used to Finance State Government Budget Deficits? A Research Note. *Public Budgeting & Finance*, *24*(1), 113–125. https://doi.org/10.1111/j.0275-1100.2004.02401006.x

Johnson, G. (2014). *Research Methods for Public Administrators: Third Edition*. Routledge.

Joseph P. DeJuan & John J. Seater. (2006). A Simple Test of Friedman's Permanent Income Hypothesis. *Economica*, *73*(289), 27–46.

Jung, J. C., & Sharon, E. (2019). The Volkswagen emissions scandal and its aftermath. *Global Business and Organizational Excellence*, *38*(4), 6–15. https://doi.org/10.1002/joe.21930

Karger, E., & Rajan, A. (2020). *Heterogeneity in the Marginal Propensity to Consume: Evidence from COVID-19 Stimulus Payments* (SSRN Scholarly Paper ID 3612828). Social Science Research Network. https://doi.org/10.2139/ssrn.3612828

Kelly, J., & Wanna, J. (2000). New Public Management and the Politics of Government Budgeting. *International Public Management Review*, *1*(1), 33–55.

Kozminski, K., & Baek, J. (2017). Can an oil-rich economy reduce its income inequality? Empirical evidence from Alaska's Permanent Fund Dividend. *Energy Economics*, *65*, 98–104. https://doi.org/10.1016/j.eneco.2017.04.021

Kreinin, M. E. (1961). Windfall Income and Consumption: Additional Evidence. *The American Economic Review*, *51*(3), 388–390.

Krueger, S., Fischer, L. A., & Benavides, A. D. (2021). Health Disasters and Local Government Finance: City of Dallas Budget Strategies During the COVID-19 Pandemic. *Municipal Finance Journal*, *42*(2), 29–49.

Levav, J., & Mcgraw, A. P. (2009). Emotional Accounting: How Feelings About Money Influence Consumer Choice. *Journal of Marketing Research (JMR)*, *46*(1), 66–80. https://doi.org/10.1509/jmkr.46.1.66

Levine, C. H., Rubin, I. S., & Wolohojian, G. G. (1981). Resource Scarcity and the Reform Model: The Management of Retrenchment in Cincinnati and Oakland. *Public Administration Review*, *41*(6), 619–628. JSTOR. https://doi.org/10.2307/975737

Lim, S. H. (2018). Does Shale Energy Development Mean More Crime? The Case of the Bakken Oil Boom. *Growth & Change*, *49*(3), 413–441. https://doi.org/10.1111/grow.12242

Marques, A. C., & Pires, P. S. (2019). Is there a resource curse phenomenon for natural gas? Evidence from countries with abundant natural gas. *Resources Policy*, *63*, 101466. https://doi.org/10.1016/j.resourpol.2019.101466

Mehiriz, K., & Marceau, R. (2014). The Flypaper and Asymmetric Effects of Intergovernmental Grants to Quebec Municipalities. *Public Budgeting & Finance*, *34*(1), 85–102. https://doi.org/10.1111/pbaf.12026

Milkman, K. L., & Beshears, J. (2009). Mental accounting and small windfalls: Evidence from an online grocer. *Journal of Economic Behavior and Organization*, *71*(2), 384–394. https://doi.org/10.1016/j.jebo.2009.04.007

Murphy, T., Brannstrom, C., Fry, M., & Ewers, M. (2018). Economic-Development Stakeholder Perspectives on Boomtown Dynamics in the Eagle Ford Shale, Texas. *Geographical Review*, *108*(1), 24–44. https://doi.org/10.1111/gere.12226

Murtazashvili, I. (2017). Institutions and the shale boom. *Journal of Institutional Economics*, *13*(1), 189–210. https://doi.org/10.1017/S1744137416000242

Naomi Caiden. (2010). Challenges Confronting Contemporary Public Budgeting: Retrospectives/Prospectives from Allen Schick. *Public Administration Review*, *70*(2), 203–210.

Newell, R. G., & Raimi, D. (2018). The fiscal impacts of increased U.S. oil and gas development on local governments. *Energy Policy*, *117*, 14–24. https://doi.org/10.1016/j.enpol.2018.02.042

Nguyen-Hoang, P., & Hou, Y. (2014). Local Fiscal Responses to Procyclical Changes in State Aid. *Publius: The Journal of Federalism*, *44*(4), 587–608. https://doi.org/10.1093/publius/pjt039

Niemeyer, D., Miner, K. R., Carlson, L. M., Baer, K., & Shorty, L. (2004). The 1998 Master Settlement Agreement: A Public Health Opportunity Realized—Or Lost? *Health Promotion Practice*, *5*(3_suppl), 21S-32S. https://doi.org/10.1177/1524839904264588

Nikolova, E., & Marinov, N. (2017). Do Public Fund Windfalls Increase Corruption? Evidence From a Natural Disaster. *Comparative Political Studies*, *50*(11), 1455.

Ouedraogo, A. (2016). Local economic impact of boom and bust in mineral resource extraction in the United States: A spatial econometrics analysis. *Resources Policy*, *50*, 292–305. https://doi.org/10.1016/j.resourpol.2016.09.009

Paler, L. (2013). Keeping the Public Purse: An Experiment in Windfalls, Taxes, and the Incentives to Restrain Government. *American Political Science Review*, *107*(4), 706.

Pallant, J. (2016). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS*. McGraw-Hill Education.

Paredes, D., Komarek, T., & Loveridge, S. (2015). Income and employment effects of shale gas extraction windfalls: Evidence from the Marcellus region. *Energy Economics*, *47*, 112–120. https://doi.org/10.1016/j.eneco.2014.09.025

Paydar, N. H., Clark, A., Rupp, J. A., & Graham, J. D. (2016). Fee disbursements and the local acceptance of unconventional gas development: Insights from Pennsylvania. *Energy Research & Social Science*, *20*, 31–44. https://doi.org/10.1016/j.erss.2016.04.007

Pressman, S. (2006). Kahneman, Tversky, and Institutional Economics. *Journal of Economic Issues (Association for Evolutionary Economics)*, *40*(2), 501–506. https://doi.org/10.1080/00213624.2006.11506929

Rabe, B. G., & Borick, C. (2013). *Conventional Politics for Unconventional Drilling? Lessons from Pennsylvanias Early Move into Fracking Policy Development*. 20.

Rabe, B. G., & Hampton, R. L. (2015). Taxing Fracking: The Politics of State Severance Taxes in the Shale Era. *Review of Policy Research*, *32*(4), 389–412. https://doi.org/10.1111/ropr.12127

Reid, M. G. (1962). Consumption, Savings and Windfall Gains. *The American Economic Review*, *52*(4), 728–737.

Rubin, I. S. (1993). Who Invented Budgeting in the United States? *Public Administration Review*, *53*(5), 438–444. https://doi.org/10.2307/976344

Rubin, I. S. (2019). *The Politics of Public Budgeting: Getting and Spending, Borrowing and Balancing*. CQ Press.

Rucker, M. H. (1984). Allocation of Windfall Income: A Case Study of a Retroactive Pay Increase to University Employees. *Journal of Consumer Affairs*, *18*(1), 101–118. https://doi.org/10.1111/j.1745-6606.1984.tb00322.x

Schick, A. (1994). From the Old Politics of Budgeting to the New. *Public Budgeting & Finance*, *14*(1), 135–144. https://doi.org/10.1111/1540-5850.01003

Shadbegian, R. J. (1999). The Effect of Tax and Expenditure Limitations on the Revenue Structure of Local Government, 1962–87. *National Tax Journal*, *52*(2), 221–237. https://doi.org/10.1086/NTJ41789391

Sica, C. E., & Huber, M. (2017). "We Can't Be Dependent on Anybody": The rhetoric of "Energy Independence" and the legitimation of fracking in Pennsylvania. *The Extractive Industries and Society*, *4*(2), 337–343. https://doi.org/10.1016/j.exis.2017.02.003

Singla, A., Mughan, S., & Howell, A. (2021). The Effects of the COVID-19 Crisis on the City of Phoenix's Budget and Creditworthiness. *Municipal Finance Journal*, *42*(1), 63–81.

Sloan, F. A., Carlisle, E. S., Rattliff, J. R., & Trogdon, J. (2005). Determinants of States' Allocations of the Master Settlement Agreement Payments. *Journal of Health Politics, Policy & Law*, *30*(4), 643–686. https://doi.org/10.1215/03616878-30-4-643

Smith, B. (2015). The resource curse exorcised: Evidence from a panel of countries. *Journal of Development Economics*, *116*, 57–73. https://doi.org/10.1016/j.jdeveco.2015.04.001

Smith, J. A., & Sugarman, D. (2014). Municipal Control of Hydrofracking in the U.S.: "The Little Engine That Might." *Environmental Liability*, *22*(1), 5–15.

Smith, M. F., & Ferguson, D. P. (2013). "Fracking democracy": Issue management and locus of policy decision-making in the Marcellus Shale gas drilling debate. *Public Relations Review*, *39*(4), 377–386. https://doi.org/10.1016/j.pubrev.2013.08.003

Snoddon, T. (2004). Budgetary shocks and revenue adjustment: How governments respond to unexpected fiscal shocks. *Economics of Governance*, *5*(2), 149–166. https://doi.org/10.1007/s10101-003-0070-6

Speight, A. E. H., & MacDonald, R. (1989). Does the public sector obey the rational expectations-permanent income hypothesis? A multi-country study of the time series properties of government expenditures. *Applied Economics*, *21*(9), 1257. https://doi.org/10.1080/758520665

Stine, W. F. (1994). Is local government revenue response to federal aid symmetrical? Evidence from pennsylvania county governments in an era of retrenchment. *National Tax Journal*, *47*(4), 799–816. https://doi.org/10.1086/NTJ41789109

Stone, S. B. (2015). Boom & Bust: The Politics of the California Budget. *Public Budgeting & Finance*, *35*(4), 112–115. https://doi.org/10.1111/pbaf.12084

Stotsky, J. G. (1991). State Fiscal Responses to Federal Government Grants. *Growth and Change*, *22*(3), 17–31. https://doi.org/10.1111/j.1468-2257.1991.tb00552.x

Sylvain Leduc & Daniel Wilson. (2017). Are State Governments Roadblocks to Federal Stimulus? Evidence on the Flypaper Effect of Highway Grants in the 2009 Recovery Act. *American Economic Journal: Economic Policy*, *9*(2), 253.

Thaler, R. H. (1999). Mental Accounting Matters. *Journal of Behavioral Decision Making*, *12*(3), 183.

Thaler, R. H. (2008). Mental Accounting and Consumer Choice. *Marketing Science*, *27*(1), 15–25. https://doi.org/10.1287/mksc.1070.0330

Tsvetkova, A., & Partridge, M. D. (2016). Economics of modern energy boomtowns: Do oil and gas shocks differ from shocks in the rest of the economy? *Energy Economics*, *59*, 81–95. https://doi.org/10.1016/j.eneco.2016.07.015

Tullio Jappelli & Luigi Pistaferri. (2014). Fiscal Policy and MPC Heterogeneity. *American Economic Journal: Macroeconomics*, *6*(4), 107–136. https://doi.org/10.2307/43189941

Weber, J. G., Wang, Y., & Chomas, M. (2016). A quantitative description of state-level taxation of oil and gas production in the continental U.S. *Energy Policy*, *96*, 289–301. https://doi.org/10.1016/j.enpol.2016.06.008

Weijermars, R. (2015). Natural Resource Wealth Optimization: A Review of Fiscal Regimes and Equitable Agreements for Petroleum and Mineral Extraction Projects. *Natural Resources Research*, *24*(4), 385–441. https://doi.org/10.1007/s11053-014-9262-8

Whitaker, E. A., Bokemeier, J. L., & Loveridge, S. (2011). Retirement Plan Participation in an Era of Change: The Case of a Rural Region*. *Rural Sociology*, *76*(3), 319–346. https://doi.org/10.1111/j.1549-0831.2011.00053.x

Wildavsky, A. (1975). *Budgeting: A comparative theory of budgetary processes*. Little. https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=brr&AN=68078539&site=eds-live&custid=s9006354

Wildavsky, A. (1988). A cultural theory of budgeting. *International Journal of Public Administration*, *11*(6), 651–677. https://doi.org/10.1080/01900698808524608

Yan, W. (2011). The interactive effect of revenue diversification and economic base on US local government revenue stability. *Public Money & Management*, *31*(6), 419–426. https://doi.org/10.1080/09540962.2011.618766

Yuntong Gou, Yuan Jiang, Rui Li, Danmin Miao, & Jiaxi Peng. (2013). The Nonfungibility of Mental Accounting: A Revision. *Social Behavior & Personality: An International Journal*, *41*(4), 625–633. https://doi.org/10.2224/sbp.2013.41.4.625

Appendix

SPSS Syntax

```
GET
  FILE='C:\Users\corey\OneDrive\Desktop\Dissertation Data\Master Working File.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
COMPUTE Windfall_Lag_2012=Disb_2011/Totrev_2012.
EXECUTE.
COMPUTE Windfall_Lag_2013=Disb_2012/Totrev_2013.
EXECUTE.
COMPUTE Windfall_Lag_2014=Disb_2013/Totrev_2014.
EXECUTE.
COMPUTE Windfall_Lag_2015=Disb_2014/Totrev_2015.
EXECUTE.
COMPUTE Windfall_Lag_2016=Disb_2015/Totrev_2016.
EXECUTE.
COMPUTE Windfall_Lag_2017=Disb_2016/Totrev_2017.
EXECUTE.
COMPUTE Windfall_Lag_2018=Disb_2017/Totrev_2018.
EXECUTE.
COMPUTE Windfall_Lag_2019=Disb_2018/Totrev_2019.
EXECUTE.
DATASET ACTIVATE DataSet1.
```

```
COMMENT in this step data was transposed from individual level data to individual-period data.
VARSTOCASES
  /MAKE SavingRate FROM Savings2011 Savings2012 Savings2013 Savings2014 Savings2015
Savings2016 Savings2017 Savings2018
  /MAKE WindfallSize FROM Windfall_RY2011 Windfall_RY2012 Windfall_RY2013
Windfall_RY2014 Windfall_RY2015 Windfall_RY2016 Windfall_RY2017 Windfall_RY2018
  /MAKE Unemployment FROM UR2012 UR2013 UR2014 UR2015 UR2016 UR2017 UR2018
UR2019
  /MAKE PCPI FROM  INC2012 INC2013 INC2014 INC2015 INC2016 INC2017 INC2018
INC2019
  /MAKE Population FROM  Population_2012 Population_2013 Population_2014
Population_2015 Population_2016 Population_2017 Population_2018 Population_2019
  /MAKE DefSurp FROM  Revoverexp_2012 Revoverexp_2013 Revoverexp_2014
Revoverexp_2015 Revoverexp_2016 Revoverexp_2017 Revoverexp_2018 Revoverexp_2019
  /INDEX=Index1(9)
  /KEEP=Municipalityname County Municipalitytype
  /NULL=KEEP.
USE ALL.
COMPUTE filter_$=(WindfallSize <= 1).
VARIABLE LABELS filter_$ 'WindfallSize <= 1 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
```

```
EXECUTE.
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT SavingRate
  /METHOD=ENTER WindfallSize Unemployment PCPI Population DefSurp.
* Curve Estimation.
TSET NEWVAR=NONE.
CURVEFIT
  /VARIABLES=SavingRate WITH WindfallSize
  /CONSTANT
  /MODEL=LINEAR QUADRATIC
  /PLOT FIT.
COMPUTE windfallsize2=WindfallSize*WindfallSize.
EXECUTE.
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
```

```
/NOORIGIN

/DEPENDENT SavingRate

/METHOD=ENTER WindfallSize windfallsize2.
```