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Public Policy, Economic Development, and Taxes: An Impact Analysis of Business Incentive Strategies at the State and Local Level

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PUBLIC POLICY, ECONOMIC DEVELOPMENT, AND TAXES: AN IMPACT ANALYSIS OF BUSINESS INCENTIVE STRATEGIES AT THE STATE AND LOCAL LEVEL

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ABSTRACT

In an effort to promote economic development, state-level policymakers have exercised discretion over the use of public money to incentivize subsidy packages for decades. Estimates suggest state governments spend approximately $50 billion annually on these initiatives. However, there has been little empirical research about the political and economic benefits received by local residents from these subsidy programs. This dissertation analyzes the effectiveness of state subsidy policy by considering induced economic spillover effects and population attrition rates. It examines how subsidy distribution is related to employment rates, average weekly wages, social capital, and population attrition. The project offers two methodological innovations. First, to look beyond the economic benefits of subsidies, I compile an original dataset of changes in population at the state and local levels. Second, using this dataset, I am able to model net migration flows as a measure of population attrition. By examining differences between urban and rural areas in the economic and political benefits of subsidy programs, I also contribute to the growing literature about the place-based component of U.S. political polarization. From a normative standpoint, I open a conversation about whether such subsidy programs might affirm – or erode – public trust in government through their implications for the accountability of policymakers.

DEDICATION

This dissertation is dedicated to the following individuals: My grandparents Dr. Harold J. "Hal" and Dorothy W. "Dottie" Smith, Cecil and Frances Nanney; Academic and life mentors Brian L. and Laura Brown Ed.D., Dr. Tom and Janice Noble, Dr. Robert M. "Bob" Smith, Dr. John Overby, Dr. Norman and Diane Lillegard, Dr. James F. "Jimmy" Lea, Dr. Archie R. and Nancy Dykes, Dr. Timothy "Tim" Hudson, and Dr. Bruce Yandle.

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1 Introduction

Representative democracy, federalism, and capitalism are interdependent extensions of the individualism ideology and natural rights embedded in most modern western civilizations. The economic benefits of capitalism rely on the private property rights given to land and labor. In contrast, the political benefits of representative democracy rely on mutual respect of individual rights considering limited or shared resources. Individual preferences must be protected and prioritized through this layered optimization of political and economic signaling. For these reasons, it can be understood why a key and enduring concern within the study of economic development includes the influence of democracies on the growth and distribution of economic gains over time. Proponents of democratic capitalism claim that both practices promote the general welfare of individual and minority populations since they both produce signaling symmetries and positive spillover effects to be enjoyed by all. In order for economies and democracies to maintain an optimal equilibrium, these dynamisms must continually reinforce each other through contracts, prices, and policies. Critics of democratic capitalism have suggested that this process only results in adverse spillover effects and political rents that are captured by the disproportionate allocation of value held by large firms. Furthermore, the legal and political forms of individual minority rights are eventually drowned out as economic power recalibrates the system from which it emerged.

This dissertation is designed to answer the following research question: How do state-subsidized incentives intended to foster economic development affect individual-level social and economic outcomes? Subsidy research has primarily focused on inter-state competition and tax treatments as a means to attract firms. The political processes that empower such subsidy decisions have received far less empirical examination. Are state-level politicians and institutions having a measurable political and economic impact, through subsidy distribution, on their constituencies? The political trust that might bind individuals to nations, states, cities, and towns is undermined if

political boundaries, and the taxes collected to support the cities and towns within them, are mutable. If some local areas benefit from subsidies while others do not, existing inequalities are exacerbated, and people are nudged to migrate to a more economically advantageous location. I introduce the concept of *constituent attrition* to measure both political and economic outcomes resulting from subsidy allocation manifest in migration patterns. From a normative perspective, constituent attraction serves as a proxy for the *political fitness* of discretionary decisions by state and local agents in allocating subsidies. The broad motivation for the study is to explore whether state governments might be held accountable for the political fitness of decisions they make about the allocation of subsidies at the local level.

Representative democracy in the United States gives state and local constituents the right to elect officials who represent their interests. Each year, state legislatures transfer $530 billion in tax (and other) revenues to local governments in subsidized incentives (subsidies) intended to fuel economic development, presumably for the benefit of constituents who elect them. Despite these efforts, and multiple levels of accountability, significant public problems persist that advantage some citizens and disadvantage others. The total backlog of deferred maintenance costs for transportation infrastructure in states today is approximately $873 billion (Zhao et al., 2019). As wealth consolidates, the income gap between the upper and lower economic classes continues to grow (Stone et al., 2020). Rural areas continue to lag behind cities on various measures of financial and physical health (Hadden, 2008). Rural rates of suicide and other "deaths of despair" continue to outpace those in urban areas (Stein et al., 2017). One way of interrogating why these inequities persist is to analyze the relationship between government funding packages and their impacts on constituents. How do state-level economic priorities and discretionary subsidy allocation affect policy outcomes? Are constituents who benefit from economic subsidies by virtue of where they live less likely to "vote with their feet" by moving to another location? Do the effects of county-level

subsidy distribution on migration reflect relative political and economic outcomes - that is, do they reflect the *political fitness* of fiscal policy within a region? Does subsidy distribution have equitable effects within rural, micropolitan, and metropolitan counties? What role might social capital play within these contexts?

Political and social organization historically has been tied to geographic boundaries and enclosing relatively stationary communities. However, the last century has brought about convenient private and public transportation opportunities that have uprooted old notions about place-based politics. International and interstate migration has become more of a rule than an exception. Public policies that build state and local institutions and infrastructures need not cater to local constituents because today people can choose to move away much more easily than ever before. The incentives that led policymakers to cater materially to their constituents a century ago have diminished with increasing mobility. The standard political argument holds that elected officials neglect their statewide fiscal responsibilities towards their constituencies, even though no research links constituent expectations, political loyalty, and economic development with local policy. Local governments, in turn, compete fiercely for state subsidy dollars despite (or perhaps because of) the inequities that result from state-subsidized economic development programs. Benefits from such programs are challenging to assess if the populations they are intended to help have been displaced, replaced, or reduced.

Recent research (Klein et al., 2020) shows that economic development in urban areas provides potential positive spillover effects for people who live in nearby areas, but only due to corrective policy strategies. Urban areas offer a concentration of resources that reduce transaction costs and provide a more efficient allocation of public goods. Relative to rural areas, they are politically more heterogeneous. Still, the aggregate spillover benefits of economic homogeneity can outweigh the political costs required to implement policies designed to spur economic growth.

Adequate planning and corrective policies are more feasible in urban areas due to the political competencies that accompany economies of scale. Urban regions that maximize collective welfare thus have continued to grow and often have branched out to establish relationships with proximate urban areas, leading to the agglomeration of specialized supply chains. The political and economic gravity that these urban agglomeration networks generate crowds out their rural counterparts. Consequently, rural areas experience an exacerbation of brain drain, a reduction in small business and startup viability, and infrastructure and institutional degradation from lost tax revenues. Urban economic success inadvertently places rural constituents at a strategic political and economic disadvantage, creating a unique challenge. Rural areas, by their nature, are less populated, more culturally homogenous, less transient, and prone to the economic suboptimalities those demographics tend to produce. From a political standpoint, however, rural areas' small population size should mean that individual preferences are more tractable than they would be in cities. Thus, both political and economic distortions should be more readily detectable in rural areas. Taking into account the differences between urban and rural settings in my model allows me an opportunity to analyze – and subsequently comment normatively about – the effects subsidized economic development programs have on the lives of rural constituents.

Individual property rights are fundamental assets for healthy democratic governance and capitalism. The United States incorporated subdivisions of legal and political accountability at the federal, state, regional, and local levels to better facilitate and protect these assets. The progression of time and population acceleration provided an opportunity for political efficiency through bundling interests into groups. Collective interests alleviate time constraints and costs that would be more prohibitive for individuals acting alone or in more isolating circumstances. Population growth in a democratically capitalist society also allows individuals to benefit financially from providing goods and services for the masses. The overlapping factor allowing for political influence and

private capital accumulation is access or connection with sizeable urban population concentrations. This creates a scenario where a lack of association with urban environments and their natural, cultural spillover effects diminishes political, economic, and social potential. Rural counties represent a unique minority lacking critical democratic capitalist exposures, unable to capture the potential political and economic scalability of their urban counterparts. Subsidy distributions represent a unique scenario where politicians, policymakers, and institutions distribute substantial funding towards local economic development projects. This makes subsidies a uniquely political form of business and community development. It stands to reason that counties with high social capital possess the political influence necessary to initiate their elected officials to distribute subsidies that specifically benefit their constituent businesses and communities. However, wealthy individuals, firms, or outside interests can acquire those same subsidies as an exercise in rent-seeking. It is additionally possible for local subsidy-induced economic development opportunities to be taken advantage of by residents of other counties, states, and countries. This research design accounts for these factors through more rigorous county migration estimates and traditional signals of economic and social health.

Subsidy distribution represents a relatively new subset of economic development policy research. Research in this area has typically focused on state and federal distributions regarding tax incentive strategies and the attraction of established large firms. Regional specialization and agglomeration represent a robust segment of subsidy impact studies. The relative impacts that subsidy distribution might have on political valuation and local federalism remain largely unexplored. Economic development research has demonstrated the role of zero-sum taxation strategies in subsidy competition (Slattery et al., 2020); however, the issues surrounding political accountability and local constituent impact have not received sufficient empirical scrutiny. Politicians and public institutions exert significant amounts of discretionary power through the facilitation of subsidy

allocation. This paper will add to previous subsidy research by incorporating local level social capital and *constituent attrition* metrics, providing additional insights into the economic development policy process. Subsidy research represents an opportunity for academia to provide all citizens with more specific, timely, and punctuated information about political decisions and economic outcomes. It will aid policymakers, citizens, and scholars in assessing political valuations associated with subsidy distribution catered for specific local impacts. It will increase information symmetry between taxpayers, elected officials, and policy analysts.

2 Background Literature

2.1 Subsidies, Institutions, and Policy

The discretionary funding governors or other elected officials provide for subsidies depends on constitutional and fiscal particulars within each of their states, such as whether (or not) to have a balanced budget. Despite these legal and fiscal differences among states, commonalities exist regarding subsidy funding and budgets. In most states each institution, department, or agency is required to present a formal budget request to the governor for consideration. Incentives that accompany subsidy offers are not direct apportionments from the governor's desk; they are funds sourced from preexisting institutional accounts or programs. Most subsidy allocations begin when a local or state economic development agency approaches the governor regarding an offer for an external or established state firm. This bureaucratic process is typically initiated one calendar year prior to the fiscal year. This allows the governor and other institutional actors enough time and systematic foresight to apply due consideration. Upon receiving institutional budget proposals in the Fall, final budget recommendations can be finalized and submitted to the appropriate committee within that state's legislature shortly after the new calendar year. At this stage, a House appropriations committee for bicameral legislatures will review the request and accordingly send it to the Senate. If there are any discrepancies between the proposals, or if the Senate has additional concerns, both chambers will have to schedule a meeting and come to some form of resolution. The confirmed or resolved budget will then be sent back to the governor, who will then sign off on or veto the funding request in part or whole. This process, along with balanced budget requirements, provides the governor significant discretionary fiscal authority when completed.

Subsidies are a form of redistributive fiscal public policy that have a direct impact on markets and private firms. Subsidies can and should therefore be examined from both an economic and institutional public goods perspective. Early research by Samuelson (1954) regarded subsidies

and incentive spending as unique forms of public expenditure. Subsidies are thus not pure public goods. They are public in a fiscal sense, yet distributed privately, resembling public shares or stocks. Samuelson believed that all public goods and services inevitably encounter a free-rider problem. If no one can be excluded from consuming a public resource, individuals would not be incentivized to reveal their preferences and send corresponding market signals. Humans possess an incentive to understate their true preferences in order to reduce their tax burden, being able to freely or fully enjoy the public good supplied by others. Markets would ultimately fail to provide public goods efficiently, and some form of regulatory agency or intermediate intervention would be needed. From this perspective, subsidized firms could take on this role of intermediary.

Tiebout (1956), also a notable policy scholar, believed that if local governments could provide goods to a mobile citizenry, capable of moving and choosing among a variety of competing local place-based goods or services, then individual citizens could choose the community that best satisfies their needs. Preferences would then be revealed by "voting with your feet," a form of exit. Individuals with expectations of quality public service would correspondingly establish themselves in areas with higher levels of public administration and higher taxes. Tax rates would accordingly differ across localities. A consequence of tax rates varying from one locality to another is that it becomes impractical to measure the effects of tax competitions or subsidies solely through tax rates. Tax competition should instead be transitioned toward a focus on public goods competition. Doing so would result in greater homogeneity in communities through choice optimality and signaling symmetry. The critical assumptions here are freedom and equity in mobility, perfect markets, and no beneficial spillover effects. Tiebout's notable contribution was that governments could deliver public goods efficiently provided they were decentralized and local.

Oates (1972) believed, as did Tiebout, that taxes and tax rates do not serve as suitable economic measures because they were likely to reflect zero-sum scenarios and so did not represent

beneficial market spillovers. Such practices would result in a taxation discrepancy with social marginal costs, creating incentives for inefficient location decisions. Wilson (1986) further explored fiscal inefficiencies between local government institutions and private firms. They demonstrated that the amount of financing used to produce public expenditures is greater than what is required to minimize costs when evaluated at the prices private firms actually pay. Collectively these scholars provide evidence that fiscal policies based on taxation competition ultimately result in Pigouvian tax type inefficiencies at the local level and that taxation is not an optimal metric for measuring economic impact.

The institutional dynamics surrounding the optimal distribution of incentivized subsidies to private firms by local administrators was a challenge that Buchanan (1999) believed would require "adjusting the institutions of politics so as to ensure that the public economy remains efficiency enhancing rather than efficiency reducing, and importantly, that these institutions be seen as such by participants in the inclusive collective enterprise". Buchanan acknowledged that shirking and selfish spillover are to be expected from time to time but, just as with markets, the invisible political hand would handle bad faith actors by voting them out of office. They also suggested that the more public institutions adopt the private market's values of information symmetry, transparency, and competition among a variety of alternatives, the more incentive citizen voters will expect public finance to respond to mutual benefits over individual interests. Where Buchanan differs from Samuelson, Tiebout, Oates, and Wilson is in their assessment of what role mobility and migration play in economic and public good scenarios. Along with Goetz (1972) and Stiglitz (2000), they maintained that migration between communities produces on average an equilibrium inefficiency resulting from the fiscal externalities and transaction costs that local institutions encounter.

The transaction costs and inefficiencies induced by migration also represent a political and legal inefficiency. The institutions and actors engaged in tax collection, subsidy distribution, and firm

selection must be held accountable to some level of obligation and loyalty to the tax-paying constituents from which they derive their authority. Hirschman (1970) understood the inefficiencies that transient constituencies present as a problem of loyalty, where loyalty meant citizens hold their representatives accountable to their communities. Loyalty functions as a check on a citizen or consumer's ability to exit, representing an acceptable signal within competitive environments.

By its very nature, citizenship is a place-based obligation, but it is rendered incompetent or meaningless if participants are fleeing. As an acceptable barrier to exit, Hirschman drew a parallel between loyalty and protective tariffs: "as infant industry tariffs have been justified by the need to give local industry a chance to become efficient, so a measure of loyalty to a firm or organization has the function of giving that firm or organization a chance to recuperate from a lapse in efficiency" [pp.79] Loyalty serves a function in society that is both political and economic by preventing the cumulative deterioration of good governance. Localities must sustain mutually beneficial long-term and credible commitments from constituents, firms, and elected officials if good governance and best practices are to hold any institutional practical value.

2.2. Subsidy Policy and Economic Development

One of the earliest and most notable roles subsidies played in the United States is their function in agriculture policy. Agriculture or farm subsidies can be traced back to the 1800s and were mostly state-funded initiatives during that time. The goal was to keep family farms and the markets they fed thriving during difficult times. It wasn't until President Franklin D. Roosevelt's New Deal introduced the Agriculture Adjustment Act in 1933 that the federal government would establish a more permanent role in the economic outcomes for agricultural firms through various forms of subsidization. Regardless of the form these agricultural subsidies took, e.g., price supports, purchases, direct payments, or crop insurance; the results were relatively the same – artificial

opportunities and successes within markets. Public policy in the form of government subsidies have allowed farms and complementary enterprises to evolve and thrive economically for almost a century.

The origin of subsidies as a more specific form of economic development in the United States can be traced to the 1976 courtship between the German automaker Volkswagen and several state governors. Interstate competition resulted in an international bidding war over where to locate Volkswagen's North American plant. Pennsylvania emerged as the winner by offering a discretionary subsidy worth roughly $100 million. The Pennsylvanian government included additional fiscal policy mechanisms, including low-interest loans, property tax abatement, and non-monetary infrastructure items in the form of workforce development, railroads, and highways. In 2019 Pennsylvania was still in the subsidy business and spent roughly $400 billion on attractive discretionary subsidies and tax abatements.

States continue to use subsidies, in all their various iterations, as economic development stimulants and attractors. The Tennessee Department of Economic and Community Development was given the following responsibilities through legislation:

> Industrial infrastructure, training, and economic development grants shall be made only where there is a commitment by a responsible official in an eligible business for the creation or retention of private-sector jobs and private investment, or where the commissioner of economic and community development determines that such investment will have a direct impact on employment and investment opportunities in the future. (TCA § 4-3–717)

The goal of subsidy policies is to monetarily aid constituents by improving local quality of life or welfare, reducing unemployment directly or indirectly, increasing wages, and enhancing economic competitiveness. These desirable welfare improvements are referred to as positive spillover effects that result from the surplus of value added when large firms pay well and develop

mutually beneficial partnerships within the more local or regional supply chain of goods and services. The economic presumption here is that "a rising tide lifts all boats" where indirect job creation is just an estimation of likelihood based on an order of magnitude greater than the direct jobs induced by a subsidy. These spillover expectations are among the most frequently touted justifications for firm subsidy competition and the accompanying incentive amount. Spillovers are the motivations at the center of subsidy competition theory. However, limited research or data indicates positive spillover effects or indirect job creation at the local level. A subsequent need exists for research and data focused on the political accountability of elected officials and policymakers regarding constituent expectations and direct local impacts.

2.3 Assessing Spillover Effects and Impacts

Spillover effects are residual economic goods or services resulting from another proximate economic activity. Spillovers effects are corollaries of positive and negative externalities, occurring whenever costs and benefits of an economic exchange are not readily captured by the intended set of economic agents. Spillover effects are opportunities for other agents to accrue profits by mitigating, transforming, or supplying additional value. These spillover effects often produce conditions that are optimal for local entrepreneurs and startups. Entrepreneurs might transition spillover effects into a new and unrelated enterprise just as a startup might see an opportunity to create a complementary good or service.

The attraction model of economic development suggests that new firms will generate sufficient externalities to induce additional economic activity for an area. The corresponding spillover effects are considered to be a primary economic benefit of firm activity. These effects are a sufficient condition for an increase in general equilibrium as a part of improved economic activity. This helps explain why it is commonly listed as the desired goal for local incentive policies, including

direct and indirect job creation. An increase in economic activity should produce more revenue (benefits) than debts (costs) for local governments, leading to a fiscal surplus. A local fiscal surplus then should bring about lower tax rates and improved public services. These relationships create a positive feedback loop whereby subsidies lead to lower taxes and improved public services, further attracting more economic activity. Alternatives outside of this strategy tend to produce zero-sum or winner's situations where benefits are illusory or negligible, and the outcome is fiscal depreciation.

Direct and indirect firm job creation are critical assumptions brought forth to justify state-level subsidy policy and size. Unfortunately, few data offer support for these claims at the state level. The use of subsidies in Tennessee provides an instructive exception. From 2017 through 2019, the state provided approximately $257 million in grants that were intended to assist preexisting state businesses and encourage external firms to relocate within its boundaries. By 2020 the Tennessee Department of Economic and Community Development and Attorney General were pursuing numerous civil and criminal charges against firms that had received subsidies. Although these firms had received about $18.4 million in taxpayer-funded economic incentives, they failed to fulfill job creation and investment promises. This situation, unfortunate as it is, illustrates an unprecedented level of institutional accountability and loyalty to tax-paying constituents.

Current research in the academic literature does not offer definitive evidence supporting the spillover effects of interstate subsidy incentive competition and economic development (Bartik 1991; Glaeser 2001; Patrick 2014; Thomas 2007). In several studies, researchers have offered evidence that economic development subsidies improve efficiency and welfare gains. Subsidies are economic development standards used to attract large firms into a state's more industrial areas by compensating them for the positive spillover effects they create (Black and Hoyt 1989; Bartik 1991; King, McAfee, and Welling 1993; Patrick 2014b). Incentive packages for large firms are believed to induce positive spillovers at a magnitude that outweighs the costs for state and local residents. These

benefits issue from an economic development feedback loop in which higher wages and increases in employment lead to greater revenues for state and local governments. Increased revenues, in turn, result in lower tax rates and improvements in public services. These positive outcomes attract startups and support new entrepreneurial activity in a virtuous circle (Eisinger 1988; Patrick 2014a).

An alternative perspective holds that any potential positive spillover effects are overwhelmingly captured by the dynamic size and scope of the optimization larger firms provide. From this perspective, it is observed that subsidy competitions naturally produce Prisoner's Dilemma outcomes that result in a negative-sum game. Despite doubts or possible alternatives, subsidy competitions nudge states into a game where all the options within its choice architecture result in efficiency losses and negative equity (Crotty 2003; Ellis and Rogers 2000; Guisinger 1985; Oates 1972; Thomas 2000; Wilson 1986; Wilson 1999; Zodrow and Mieszkowski 1986). Additional research from this perspective has shown that this negative-sum game is exacerbated when a state engages in over-bidding and then suffers the winner's curse (Christiansen, Oman, and Charleton 2003; Schragger 2009; Ulbrich 2002). Some research has supported the claim that incentives are revenue negative (Bartik 1994; Chirinko and Wilson 2008; LeRoy 2005; Oman 2000; Rodriguez-Pose and Arbix 2001), whereas studies conducted by Dalehite, Mikesell, and Zorn (2008), Greenstone and Moretti (2003), and Goodman (2003) failed to show evidence of subsidy induced fiscal depreciation. Localities facing fiscal deficits resulting from subsidies are forced to confront this negative effect on revenue either through appropriate tax measures (i.e., higher rates) or through reductions in public services (Diechman et al. 2008; Figlio and Blonigen 2000). Studies by Lynch (2004) and Thomas (2007) examined the effects of higher taxes and reductions in public services to determine whether they induce citizens to relocate or negotiate salary increases. They concluded that both the new firms and preexisting local businesses are vulnerable to adverse spillover effects that follow from fiscal deficits. Further, fiscal deficits draw down resources that otherwise would be applied to

infrastructure improvements and enhancements to public services. Taxes on new firms are unlikely to replace these resources. As a result, the entire local business ecosystem suffers a general equilibrium effect whereby employment, wages, and essential public services decrease (Bartik 2005; Fisher 1997).

A study by Greenstone, Hornbeck, and Moretti (2010) examined indirect agglomeration effects by estimating the economic development impact large firms had on the total factor productivity of existing firms, operationalizing indirect spillover effects by the opening of new businesses or startups. The runners-up counties in the subsidy competition served as a control group. Their results indicated that the number of large firms increased by about 12.5% in winning counties shortly after opening, followed by a 15% increase in total output. They concluded that the new business startups choose to locate in the winning counties to gain access to productivity spillovers generated by larger firms. The core assumption of their theory holds that large firms generate additional new businesses. These new businesses then contribute positive spillover effects that spread across all local business sectors. The continued attraction and entry of startups or complementary firms increase productivity. Access to production inputs is compounded, increasing input prices. This increase in production costs becomes proportional to the increase in the value of outputs resulting from spillover effects, thereby reaching a long-run equilibrium.

Patrick (2018) has questioned the conclusions reached by Greenstone, Hornbeck, and Moretti (2010). Patrick (2018) questioned their reliance on reports taken from economic development magazines whose institutional features cast doubt on the legitimacy of their natural experiment's identification methods. Further, evidence of positive productivity spillovers and the realization of economic growth should not have been interpreted as exclusively resulting from subsidy effects. To provide empirical evidence supporting this critique, Patrick (2018) replicated the Greenstone, Hornbeck, and Moretti (2010) study using a sample of their population. They then

investigated whether specific economic growth benchmarks could be achieved due to successful large firm attraction using a geographically proximate matching control strategy. Measures of new economic activity supporting archetypal economic development policy goals, including aggregate county changes in manufacturing firms, firm output, wage employment, and salary were used in the replication study. The results indicate that the successful attraction of a large firm cannot be justified on claims that it will definitively result in economic growth and positive spillover effects. The preferred estimates from the replication study indicated that large firms induce incremental increases in output, employment, and earnings; however, even with substantial spillovers, the general equilibrium effects of directing public resources towards large firm incentive offers might overshadow any real benefits.

An additional consideration regarding spillover effects involves the effects of in-migration. New jobs and increases in wages and salaries draw new residents (Glaeser and Gotlieb, 2008). Research has indicated that an in-migrant workforce fills most direct and indirect job creation (Bartik 1991; Partridge, Rickman, and Li 2009), a workforce that presents local governments with a net fiscal loss (Altsuler and Gomez-Ibanez 1993; Fisher 2007; Slattery 2019). Although often seen as a given economic benefit, an influx of new residents typically adds pressure on rents, resources, and wages. An important implication follows from the fact that wages are often used to detect any fundamental economic changes that might require adjustments in tax rates and the provision of public services: If state and local communities are not preemptive and proactive regarding the intended purposes or outcomes of firm attraction, subsidies could result in a net loss stemming from increased factor prices, public service reductions, and counterproductive taxation strategies. Patrick (2015) thus concluded that "even in the presence of positive productivity spillovers, it is unclear whether incentivizing large plant locations achieves local economic development goals".

Subsidy-induced economic development places atypical pressures on wages, rents, taxes, and public services in local communities, making fiscal surplus forecasting difficult for local officials. Even if revenue changes and expenditure estimates are calculated carefully, financial forecasts will offer little to no useful fiscal surplus information. Public service production costs may also increase if higher input costs outweigh savings from economies of scale (Ladd and Yinger, 1991). Therefore, public officials and policymakers should anticipate revenue and expenditure fluctuations and accompany them with per capita and tax rate changes.

2.4. Place-Based Policies

"Local economic development policy aims to increase a location's capacity to create or retain wealth, which is most often articulated in terms of economic and fiscal benefits" (Patrick, 2018). The ability of a state or county to maximize the monetization of public trust represented by a subsidy offer is highly dependent on adequate location considerations and preparation. Location-specific economic development is often referred to as place-based policymaking. Place-based public policies seek to align economic spillover effects with the geographic particulars of local communities and are frequently employed throughout the world (Glaeser and Gottlieb, 2008; Kline and Moretti, 2014b; Ehrlich and Overman, 2020). Most academic research involving place-based policies focuses either on their efficiency costs (e.g., Glaeser and Gottlieb, 2008; Albouy, 2009; Fajgelbaum et al., 2018; Gaubert, 2018; Austin et al., 2018) or on the potential for such programs to correct market failures by internalizing productivity spillovers or other local externalities (e.g., Kline, 2010; Kline and Moretti, 2014a; Fajgelbaum and Gaubert, 2020; Rossi-Hansberg et al., 2019; Austin et al., 2018; Fu and Gregory, 2019).

Yagan et al. (2020) examined incentive distributions related to economic development policy by exploring whether or not gain in equity might have an offsetting effect on efficiency costs within

distressed local communities. They concluded that the general welfare of distressed localities could be improved if they receive the same form of tax incentives that accompany large firms and businesses. Place-based redistribution is justifiable when it lowers the efficiency costs that typically accompany other effects associated with large economic development efforts. Place-based redistributions "will tend to be desirable when spatial transfers induce few moves, when productivity is uniform across space, when labor supply is especially elastic, and when there is strong sorting across place-based on earnings" (Yagan, D., Gaubert, C., and Kline, P. 2020). These authors provide valuable insights and methods that could be used in the cost-benefit calculations for any geographic area. Although their research focused on distressed individuals within urban regions, application towards rural counterparts is feasible as poverty and opportunity are not discriminatory.

2.5. Urban and Rural Distribution

Place-based policies are an attempt by policymakers and public officials to attract large firms in the hope that doing so will generate economic growth, particularly in the form of spillovers. Yagan et al. (2020) focused on place-based policies within the context of an urban environment where the equity-efficiency tradeoffs relied on spatial concentrations and scaled economic fiscal policies that are unique to cities. Urban areas and the large industries within can develop specializations and production efficiencies through mutually beneficial supply chains with other nearby cities. This process is known as agglomeration, and it represents a competitive disadvantage for smaller neighboring economies. Striking a balance between successful or sustainable rural versus urban economic development policy is not an easy task. Kline and Moretti (2013) were able to produce policy-relevant findings demonstrating how, in limited cases, a large organization such as the Tennessee Valley Authority (TVA) can generate sustainable spillover effects for a region, most notably when those jobs are high paying. This case is distinctive because the steady flow of

incentives through the TVA was federally funded. The economic impact of this type of place-based project had "persisted well beyond the lapsing of the regional subsidies, suggesting the presence of powerful agglomeration economies. By contrast, the agricultural sector, which is unlikely to exhibit substantial agglomeration forces, retracted dramatically once subsidies terminated". Agricultural sectors and communities are, by their nature, rural and are limited in their ability to employ the kinds of economic development strategies through which they might establish and harness positive spillovers with mutually beneficial goods and services. Relative to urban areas, rural areas face the costs of lower efficiency, sub-optimal supply chains, and deficient knowledge spillovers, thereby creating a substantial disadvantage. Bartik (2020) recently researched rural place-based incentive policies and concluded:

> [T]he rationale for these policies is that they can advance equity and efficiency by increasing long-term employment rates in distressed local labor markets. However, current incentives are not targeted at distressed areas. Furthermore, incentives have high costs per job created. Public services can achieve lower costs to businesses, such as manufacturing extension, customized job training, and infrastructure. Reforms to place-based jobs policies should focus on greater targeting of distressed areas and using more cost-effective approaches. Such reforms could be achieved by state and local governments acting in their residents' interests or could be encouraged by federal interventions to cap incentives and provide aid to distressed areas.

It may be the case that rural place-based policies also fail to generate organized buy-in among local constituents and sufficient funding that is tied to a place and firm outcomes. Outcomes might be more favorable were initiatives designed to merge local labor markets with entrepreneurs and startups in a more organic manner. Such initiatives would focus on sustaining operations in the long run as well as providing constituents with direct benefits from their tax investments.

3 Data and Methodology

3.1 Dataset

The dataset is comprised of county-level subsidy dispersion information, social capital indices, county-level migration flows, and general economic health indicators. Annual data from 2005 to 2019 is used. Population size is gathered from U.S. Census estimates and will be used for determining rural, micropolitan (micro), and urban counties. County populations with 49,999 residents or fewer will constitute rural. Counties between 50,000 and 99,999 residents are micropolitan. Urban counties are those with 100,000 residents or more. The eight southeastern states of Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia are examined. The dynamics of competition cause regions to replicate policies from neighboring states and counties, including economic development incentive policies. Thus, regional features are likely correlated regarding allocation effects. Geographic restriction also helps facilitate controls for regional productivity shocks corresponding to county subsidy allocation. Not all counties receive subsidies and only counties receiving one million dollars or more are included in this study. The resulting population sample consists of 493 subsidy allocations among 121 counties: 127 rural, 92 micro, and 274 urban, (see Tables 3.1 - 3.3).

3.2 Subsidies

Subsidy data was obtained from the *Good Jobs First* subsidy tracker website. Subsidies are categorized by type (grant, abatement, PILOT, megadeal, etc.), amount, year, fiscal distribution source (local, state, multiple, etc.), and company or firm when possible. Some states report very detailed and specific information, others report much less. Georgia, Kentucky, North Carolina, and Virginia do not provide any firm-level information. Virginia, South Carolina, and Kentucky do not

provide any information regarding subsidy type. Georgia identifies subsidy type in a very general way e.g., tax credit/rebate/abatement, whereas Mississippi provides more specific details (e.g., Rural Impact Program). Some states that report subsidy type are not consistently so and might omit or code in an intractable manner. Only counties with subsidies valued at one million dollars or more are considered, as most subsidies are temporary allotments and values below that threshold are not likely instances of substantial economic development. The data suggests that most subsidies represent support for existing businesses and programs in the form of grants. The second most common subsidy type is tax abatement or PILOT. PILOT (Payment In Lieu Of Taxes) is an incentive strategy offering taxation abatement over time. The Development Corporation of Knox County, Tennessee states that their PILOT program "is targeted at development of property for either jobs creating economic development projects or economic-catalyst projects". PILOT subsidies are the state of Tennessee's primary incentive strategy, resulting in irregularly high valuation. Megadeal subsidies represent large firm establishment in a county, requiring an extensive period of construction. Megadeals represent the smallest percentage of subsidy type. Only 16% of Alabama's total subsidies are listed as site-selection megadeals. In instances where pertinent research information might have been lacking in the dataset, other internet sources are utilized for cross-referencing, identification, and confirmation (see Table 3.4).

3.3 Social Capital

Social capital (*SKI*) refers to aspects of social affiliation such as civic connections, cultural norms, and trust that enhance economic development and growth. These affiliations assist economic growth conditions through optimized communal information symmetry and natural cooperation. The resulting reduction in transaction and information costs reduces risk, which encourages more contracting and exchange within transactional marketplaces. Decreased social capital conversely

represents a heavier regulatory environment and more challenging local socio-economic conditions. Social capital metrics have been tested by Rupasingha *et al.* (2006) who developed an economic growth model where change in U.S. county-level per-capita personal income was tested against social capital control variables that include aspects of associational activity, charitable giving, voting, and crime. More specifically, metrics for social capital are based on the number of the following establishments per county: bowling centers, public golf courses, sports and recreation membership, civic organization associations, religious establishments, labor organizations, business associations, professional organizations, political organizations; as well as charitable giving, voter turnout, right-to-work status, county isolation, corporate tax level, and crime rate. Their results suggest that social capital has a positive additive effect on economic growth and development in U.S. counties. Social capital values for each county in this paper are based on Rupasingha *et al.*'s formula and findings. Testing for endogeneity concerns were addressed by testing variable values before and after a subsidy allocation, revealing insignificant results.

3.4 Constituent Attrition

Constituent attrition (CONSAT) is a value extrapolated from the U.S. Census Bureau's Flows Mapper. The Census Flows Mapper is a web-based human migration mapping application that utilizes data obtained from The American Community Survey (ACS). ACS migration values establish current and previous county-to-county residential status while also tracking interstate, intrastate, and international migration. Annual data is condensed into five-year dataset ranges beginning in 2005 and ending in 2019. These five-year ranges are designed to capture county-level migration flows, while also providing more dynamic annual population estimates. Selecting a dataset range that has the median value for the year a subsidy was distributed, provides a five-year migration moving average for the median distribution. From this dataset, I calculate a value for constituent

attrition by taking the sum differential for all quinquennial migration in to and out of a county for each instance of subsidy allocation. These migration values are general approximations constituting rates of attrition through exit, a proxy indicator for political and economic approval. It provides county residents and politicians an accountability metric linking political purpose with economic outcomes.

3.5 Employment and Wages

U.S. Bureau of Labor Statistics data will be used for 12-month percentage change in employment and 12-month percentage change in average weekly wage estimations. These two variables are regularly used to gauge local economic health. To better measure subsidy impact of these variables through time, compound annual growth rate is calculated two years prior and four years preceding the year a subsidy distribution occurs within each county.

(1) Variable index

Subsidy distribution (log_SUBSD). Indicates substantial subsidy (grant, abatement, PILOT, megadeal, etc.) allocation to a county. A log transform was used to reduce skewness resulting from PILOT outliers.

Social capital (SKI). Economically mitigating civic interactions (organization membership density, crime rate, charitable giving, voter turnout, etc.).

12-month % change in employment (EMP). Fourth quarter percentage change in employment for each county the year a subsidy was received.

12-month % change in employment (EMPost) Change in annual growth of employment for the four years after subsidy distribution in a county.

12-month % change in average weekly wage (AVGW). Fourth quarter percentage change in average weekly wages for individuals within each county the year a subsidy was received.

12-month % change in average weekly wage (AVGWPost) Change in annual growth of average weekly wages for the four years after subsidy distribution in a county.

Constituent attrition (CONSAT). Constituent attrition represents median quinquennial net migration effects on a county's population, where the median represents the year of subsidy distribution. Net migration is a county's quinquennial variability differential calculated from total in-migration (movers from other counties, states, and abroad) and total out-migration (movers to different states and counties).

Moderators (County Type)

Rural. Populations <49,999 residents.

Micropolitan or **Micro.** Populations between 50,000 and 99,999 residents.

Urban. County populations >100,000 residents.

The moderators of rural, micropolitan, and urban will be used to determine if county type arbitrates the relationships of the dependent variables *AVGWpost*, *EMPost*, and *CONSAT* when accounting for subsidy distribution and social capital respectively.

3.6 Methodology

To fully evaluate the primary hypothesis and adequately test statistical relationships between variables, a data analysis plan consisting of three separate levels is used. The first level tests for core relationships between subsidy distribution and social capital as they relate to wage, employment, and constituent attrition. The second level of analysis more closely examines the effect of subsidy distribution on wage, employment, and constituent attrition while controlling for the level of social

capital. The third level of analysis again examines the effect of subsidy distribution on wage, employment, and constituent attrition, controlling for the level of social capital, while also moderating for county type (urban, micropolitan, and rural). For each stage of analysis, assumptions of normality and homogeneity of variance were assessed.

3.6.1 Data Analysis Plan

3.6.1.1 Stage 1

This stage of analysis will examine how each continuous independent variable (*SUBSD, SKI*) interacts with the dependent variables (*AVGWPost, EMPost, CONSAT*) by employing a Pearson's r correlation. Pearson's r tests for correlations among variables, normalizing covariant linear values between -1 and 1(see Tables 4.1 – 4.6).

Hypothesis 1.1. Is subsidy distribution associated with four-year aftereffect changes in annual growth for average weekly wages?

$$AVGWPost = \beta_0 + \beta_1 log\_SUBSD + \varepsilon$$

Hypothesis 1.2. Is subsidy distribution associated with four-year aftereffect change in annual growth for employment?

$$EMPost = \beta_0 + \beta_1 log\_SUBSD + \varepsilon$$

Hypothesis 1.3. Is subsidy distribution associated with increased levels of constituent attrition?

$$CONSAT = \beta_0 + \beta_1 log\_SUBSD + \varepsilon$$

Hypothesis 1.4. Is social capital associated with four-year aftereffect changes in annual growth for average weekly wages?

$$AVGWPost = \beta_0 + \beta_1 SKI + \varepsilon$$

Hypothesis 1.5. Is social capital associated with four-year aftereffect change in annual growth for employment?

$$EMPost = \beta_0 + \beta_1 SKI + \varepsilon$$

Hypothesis 1.6. Is social capital associated with increased levels of constituent attrition?

$$CONSAT = \beta_0 + \beta_1 SKI + \varepsilon$$

3.6.1.2 Stage 2

In this stage of analysis, three linear regressions will be used to determine the relationship between the variable (*SUBSD*), using social capital (*SKI*) as a control variable, with a model testing for each of the three variables (*AVGWPost, EMPost, CONSAT*).

Hypothesis 2.1. Subsidy distribution and elevated levels of social capital have a positive impact on a county's four-year aftereffect changes in annual growth for average weekly wages (see Table 4.7).

$$AVGWPost = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

Hypothesis 2.2. Subsidy distribution and elevated levels of social capital have a positive impact on a county's four-year aftereffect change in annual growth for employment (see Table 4.8).

$$EMPost = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

Hypothesis 2.3. Subsidy distribution and elevated levels of social capital have a positive impact on a county's level of constituent attrition (see Table 4.9).

$$CONSAT = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

3.6.1.3 Stage 3

The third stage of analysis consists of three sets of moderated linear regressions that will be used to determine the relationship between the variable (*SUBSD*), where social capital (*SKI*) is a control variable testing for each of the three variables (*AVGWPost, EMPost, CONSAT*) while incorporating a separate model accounting for rural, micropolitan, and urban county type effects.

Hypothesis 3.1. Subsidy distribution and elevated levels of social capital have a positive impact on a county's four-year aftereffect changes in annual growth for average weekly wages regardless of county type.

$$AVGWPost_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

$$AVGWPost_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

$$AVGWPost_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

Hypothesis 3.2. Subsidy distribution and high levels of social capital have a positive impact on a county's four-year aftereffect change in annual growth for employment regardless of county type.

$$EMPost_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

$$EMPost_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

$$EMPost_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

Hypothesis 3.3. Subsidy distribution and high levels of social capital have a positive impact on a county's level of constituent attrition regardless of county type.

$$CONSAT_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

$$CONSAT_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

$$CONSAT_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$$

4 Empirical Analysis

The first stage of analysis consists of six linear regressions testing the correlations between the variable's subsidy distribution (*log_SUBSD*), social capital (*SKI*), constituent attrition (*CONSAT*), four-year aftereffect changes in annual growth for average weekly wages (*AVGWPost*), and four-year aftereffect changes in annual growth for employment (*EMPost*). Hypothesis 1.1 examined the linear relationship between four-year aftereffect changes in annual growth for average weekly wages (*AVGWPost*) and subsidy distribution (*SUBSD*). A Pearson correlation coefficient was used to assess the linear relationship between these two variables. The result indicated a weak positive correlation with no evidence of a linear relationship between the two variables, $r(491) = .003$, $p = .943$ (see Table 4.1, Graph 4.1).

Hypothesis 1.2 examined the linear relationship between four-year aftereffect change in annual growth for employment (*EMPost*) and subsidy distribution (*log_SUBSD*). A Pearson correlation coefficient was used to assess the linear relationship between these two variables. The result indicated a weak negative correlation with no evidence of a linear relationship between the two variables, $r(491) = -.049$, $p = .276$ (see Table 4.2).

Hypothesis 1.3 examined the linear relationship between constituent attrition (*CONSAT*) and subsidy distribution (*log_SUBSD*). A Pearson correlation coefficient was used to assess the linear relationship between these two variables. The result indicated a weak positive correlation with no evidence of a linear relationship between the two variables, $r(491) = .062$, $p = .167$ (see Table 4.3).

Hypothesis 1.4 examined the linear relationship between four-year aftereffect changes in annual growth for average weekly wages (*AVGWPost*) and social capital (*SKI*). A Pearson correlation coefficient was used to assess the linear relationship between these two variables. The result

indicated a weak negative correlation but no evidence of a linear relationship between the two variables, $r(491) = -.016$, $p = .726$ (see Table 4.4).

Hypothesis 1.5 examined the linear relationship between four-year aftereffect change in annual growth for employment (*EMPost*) and social capital (*SKI*). A Pearson correlation coefficient was used to assess the linear relationship between these two variables. The result indicated a weak negative correlation with no evidence of a linear relationship between the two variables, $r(491) = -.035$, $p = .431$ (see Table 4.5).

Hypothesis 1.6 examined the linear relationship between constituent attrition (*CONSAT*) and social capital (*SKI*). A Pearson correlation coefficient was used to assess the linear relationship between these two variables. The result indicated a weak negative correlation with evidence of a linear relationship between the two variables, $r(491) = -.102$, $p = .023$, using an alpha cutoff of .05, (see Table 4.6).

The second stage of analysis consists of three linear regressions testing the relationship between subsidy distribution (*log_SUBSD*), using social capital (*SKI*) as a control variable for constituent attrition (*CONSAT*) with four-year aftereffect changes in annual growth for both average weekly wages (*AVGWPost*) and employment (*EMPost*). Hypothesis 2.1 examined the linear relationship between four-year aftereffect changes in annual growth for average weekly wages (*AVGWPost*) considering subsidy distribution (*log_SUBSD*) and social capital (*SKI*) pairwise interaction effects. Linear regression was used to test if subsidy distribution and social capital significantly predicted four-year aftereffect changes in annual growth for average weekly wages. The fitted regression model was: $AVGWPost = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The regression model was not statistically significant ($R^2 = .002$, $F(3, 489) = .250$, $p = .861$). It was found that subsidy distribution did not significantly predict four-year aftereffect changes in annual growth for average weekly wages ($\beta = .001$, $p = .988$). It was found that social capital did not significantly predict four-

year aftereffect changes in annual growth for average weekly wages (β = -.017, p = .700). The interaction effect of subsidy distribution and social capital were not significant predictors of four-year aftereffect changes in annual growth for average weekly wages (β = .001, p = .988), (see Table 4.7).

Hypothesis 2.2 examined the linear relationship between four-year aftereffect change in annual growth for employment (*EMPost*) considering subsidy distribution (*log_SUBSD*) and social capital (*SKI*) pairwise interaction effects. Linear regression was used to test if subsidy distribution and social capital significantly predicted four-year aftereffect change in annual growth for employment. The fitted regression model was: $EMPost = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant (R^2 = .012, F(3, 489) = 1.999, p = .113). It was found that subsidy distribution did not significantly predict four-year aftereffect change in annual growth for employment (β = -.056, p = .218). It was found that social capital did not significantly predict four-year aftereffect change in annual growth for employment (β = -.042, p = .345). The interaction effect of subsidy distribution and social capital were significant predictors of four-year aftereffect changes in annual growth for employment (β = -.091, p = .044), (see Table 4.8).

Hypothesis 2.3 examined the linear relationship between constituent attrition (*CONSAT*) considering subsidy distribution (*log_SUBSD*) and social capital (*SKI*) pairwise interaction effects. Linear regression was used to test if subsidy distribution and social capital significantly predicted constituent attrition. The fitted regression model was: $CONSAT = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was statistically significant (R^2 = .018, F(3, 489) = 3.047, p = .028). It was found that subsidy distribution did not significantly predict constituent attrition (β = .053, p = .233). It was found that social capital did significantly predict constituent attrition (β = -.102, p = .023). The interaction effect of subsidy distribution and social capital were not significant predictors of four-year aftereffect changes in annual growth for employment (β = -.069, p = .126), (see Table 4.9).

The third stage of analysis consists of three moderated linear regressions testing the relationship between subsidy distribution (*log_SUBSD*), using social capital (*SKI*) as a control variable for constituent attrition (*CONSAT*) with four-year aftereffect changes in annual growth for both average weekly wages (*AVGWPost*) and employment (*EMPost*), for rural, urban, and micropolitan counties separately. Hypothesis 3.1 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on four-year aftereffect changes in annual growth for average weekly wages (*AVGWPost*) considering county type (*rural, micro, urban*). Moderated linear regression was used to test if subsidy distribution and social capital significantly predicted four-year aftereffect changes in annual growth for average weekly wages for rural, micropolitan, and urban counties. The fitted regression model was: $AVGWPost_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant ($R^2 = .020$, $F(3, 123) = .857$, $p = .466$). It was found that subsidy distribution did not significantly predict four-year aftereffect changes in annual growth for average weekly wages ($\beta = -.140$, $p = .122$). It was found that social capital did not significantly predict four-year aftereffect changes in annual growth for average weekly wages ($\beta = -.011$, $p = .900$). The interaction effect of subsidy distribution and social capital were not significant predictors of four-year aftereffect changes in annual growth for average weekly wages ($\beta = -.001$, $p = .940$), (see Table 4.7.1).

Hypothesis 3.1.2 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on four-year aftereffect changes in annual growth for average weekly wages ($AVGWPost_{micro}$) considering micropolitan county type. The fitted regression model was: $AVGWPost_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant ($R^2 = .018$, $F(3, 88) = .541$, $p = .655$). It was found that subsidy distribution did not significantly predict four-year aftereffect changes in annual growth for average weekly wages ($\beta = -.127$, $p = .261$). It was found that social capital did not significantly predict four-year aftereffect

changes in annual growth for average weekly wages (β = .067, p = .545). The interaction effect of subsidy distribution and social capital were not significant predictors of four-year aftereffect changes in annual growth for average weekly wages (β = .092, p = .434), (see Table 4.7.2).

Hypothesis 3.1.3 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on four-year aftereffect changes in annual growth for average weekly wages ($AVGWPost_{urban}$) considering urban county type. The fitted regression model was: $AVGWPost_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant (R^2 = .009, F(3, 270) = 3.221, p = .459). It was found that subsidy distribution did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = .078, p = .203). It was found that social capital did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = -.028, p = .640). The interaction effect of subsidy distribution and social capital were not significant predictors of four-year aftereffect changes in annual growth for average weekly wages (β = -.040, p = .507), (see Table 4.7.3).

Hypothesis 3.2 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on four-year aftereffect change in annual growth for employment (*EMPost*) considering county type (*rural, micro, urban*). Moderated linear regression was used to test if subsidy distribution and social capital significantly predicted four-year aftereffect changes in annual growth for average weekly wages for rural, micropolitan, and urban counties. The fitted regression model was: $EMPost_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant (R^2 = .06, F(3, 123) = 1.485, p = .466). It was found that subsidy distribution did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = -.074, p = .401). It was found that social capital did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = -.027, p = .760). The interaction effect of

subsidy distribution and social capital were significant predictors of four-year aftereffect changes in annual growth for average weekly wages (β = -.225, p = .012), (see Table 4.8.1).

Hypothesis 3.2.2 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on four-year aftereffect change in annual growth for employment ($EMPost_{micro}$) considering micropolitan county type. The fitted regression model was: $EMPost_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant (R^2 = .033, F(3, 88) = .993, p = .399). It was found that subsidy distribution did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = .060, p = .591). It was found that social capital did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = -.184, p = .096). The interaction effect of subsidy distribution and social capital were not significant predictors of four-year aftereffect changes in annual growth for average weekly wages (β = -.080, p = .490), (see Table 4.8.2).

Hypothesis 3.2.3 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on four-year aftereffect changes in annual growth for employment ($EMPost_{urban}$) considering urban county type. The fitted regression model was: $EMPost_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant (R^2 = .010, F(3, 270) = .993, p = .396). It was found that subsidy distribution did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = -.074, p = .219). It was found that social capital did not significantly predict four-year aftereffect changes in annual growth for average weekly wages (β = -.011, p = .853). The interaction effect of subsidy distribution and social capital were not significant predictors of four-year aftereffect changes in annual growth for average weekly wages (β = -.078, p = .199), (see Table 4.8.3).

Hypothesis 3.3 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on constituent attrition (*CONSAT*) considering county type

(*rural, micro, urban*). Moderated linear regression was used to test if subsidy distribution and social capital significantly predicted four-year aftereffect changes in annual growth for average weekly wages for rural, micropolitan, and urban counties. The fitted regression model was: $CONSAT_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was statistically significant ($R^2 = .059$, $F(3, 123) = 2.577$, $p = .056$). It was found that subsidy distribution did not significantly predict constituent attrition ($\beta = .032$, $p = .717$). It was found that social capital did significantly predict constituent attrition ($\beta = .239$, $p = .008$). The interaction effect of subsidy distribution and social capital were significant predictors of constituent attrition ($\beta = .026$, $p = .770$), (see Table 4.9.1).

Hypothesis 3.3.2 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on constituent attrition (*CONSAT*) considering county type (*rural, micro, urban*). The fitted regression model was: $CONSAT_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant ($R^2 = .033$, $F(3, 88) = 1.018$, $p = .388$). It was found that subsidy distribution did not significantly predict constituent attrition in micropolitan counties ($\beta = -.059$, $p = .593$). It was found that social capital did not significantly predict constituent attrition ($\beta = -.113$, $p = .305$). The interaction effect of subsidy distribution and social capital were not significant predictors of constituent attrition ($\beta = .119$, $p = .305$), (see Table 4.9.2).

Hypothesis 3.3.3 examined whether or not subsidy distribution (*log_SUBSD*) and levels of social capital (*SKI*) have an impact on constituent attrition (*CONSAT*) considering county type (*rural, micro, urban*). The fitted regression model was: $CONSAT_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$. The overall regression was not statistically significant for urban counties ($R^2 = .023$, $F(3, 270) = 2.120$, $p = .096$). It was found that subsidy distribution did not significantly predict constituent attrition ($\beta = -.049$, $p = .410$). It was found that social capital did significantly predict constituent attrition ($\beta = -.142$, $p = .019$). The interaction effect of subsidy distribution and social capital were not significant predictors of constituent attrition ($\beta = -.035$, $p = .558$), (see Table 4.9.3).

5 Conclusion

State and local politicians exercise a lot of fiscal discretion through their allocation of various forms of subsidies. Subsidies are intended to benefit economic development within their districts and among constituents, notwithstanding the lack of scholarly consensus regarding any economic development impacts they might possess. This paper contributes to the discussion by further examining whether large state and local subsidies stimulate economic development. The impacts and extent to which subsidy policies contribute to local improvements and successful home-grown business development has lacked empirical analysis. This paper additionally contributes to the literature by developing a more local political metric, constituent attrition, that captures population estimates to include dedicated voters and invested taxpayers. Net migration has traditionally been used to estimate and account for national and international immigration rates. Constituent attrition is an attempt to capture a less general and more useful political model of net migration using a quinquennial differential to account for international, interstate, and intrastate residential movement at the county level. This will help researchers and policy makers better understand the political and economic impacts of place-based policies, the realities behind local political promises, and an opportunity to identify state and local fiscal policies that are better designed to capture and sustain resident interests.

A general analysis of the data did indicate that subsidy distribution, four-year aftereffect changes in annual growth for employment, social capital, and constituency attrition possess some explanatory power, particularly in rural and urban areas. The first stage of analysis found a low slightly negative correlation (10%) between constituent attrition and social capital in the overall model for Hypothesis 1.6. The strength of social capital and civic engagement gradually decreasing as the constituency population increases. A possible explanation for this could be that gains in

constituent attrition represent an influx of new residents who would likely not be very active or invested in local politics and civics. The additional first-stage models of hypothesis tests did not yield significant effects.

In the second stage of analysis, social capital was added as a control variable as well as a potential moderating variable for the effect of subsidy distribution on the dependent variables. In Hypothesis 2.2, the interaction effect of subsidy distribution and social capital were significant predictors of four-year aftereffect changes in annual growth for employment. For every unit increase of social capital and subsidy distribution, the four-year aftereffect changes in annual growth for employment experience a -.091 decrease. As residents in areas receiving large subsidy allocations become more politically engaged within their communities over time, the level of annual growth for employment declines. Whether or not the underlying causes of this employment decline are natural, frictional, or structural would require a more significant level of detailed analysis. Subsidy distribution and social capital interactions were additionally found to have a negative effect on constituent attrition for Hypothesis 2.3. Social capital representing a particularly significant effect on constituent attrition. This again appears to indicate that social capital and civic engagement gradually decrease as a constituency population increases. The other models within the second stage of analysis did not yield significant results.

In the third stage of analysis, second stage model interactions were again examined but using sets of moderated regressions for county type. Hypothesis 3.2 indicated significant interaction effects between subsidy distribution and social capital's impact on the four-year aftereffect changes in annual growth for employment for rural counties. For every unit increase of social capital and subsidy distribution, four-year aftereffect changes in annual growth for rural county employment will experience a -.225 decrease. This result partially mirrors Slattery's findings where subsidized counties experienced slight increases in employment and earnings that were neutralized by increases in tax

rates, property valuations, and debt. The upward pressure on wages is also likely to impede local establishment effects. Rural communities appear more sensitive to positive effects of large subsidy allocations and social capital, with a corresponding negative effect on annual growth for employment in the years preceding a subsidized economic development event. When county moderation is applied to the effects that subsidy distribution and social capital have upon constituent attrition for Hypotheses 3.3 and 3.3.3, social capital appears to possess greater significance in both rural and urban counties. For rural counties, higher levels of social capital correspond with an increase in constituent attrition ($\beta = .239$). For urban counties, higher levels of social capital correspond with a decrease in constituent attrition ($\beta = -.142$). Subsidized economic development policies have a more pronounced impact in rural counties possessing high levels of social capital and are more likely to produce positive returns in terms of political constituency. Social capital's impact within urban counties is likewise significant but with negative constituency outcomes. The other models within the third stage of analysis did not yield significant results.

Despite the aforementioned results, most of the hypotheses failed to produce any remarkable relationships or predictability between subsidy distribution, employment, wages, constituent attrition, and social capital. Considering the size and scale of these economic investments, this might be a cause for concern. However, these results align with similar conclusions reached by subsidy researchers such as Bartik, Slattery, and Zidar. State and local governments invest substantial amounts of money towards subsidized economic development projects. There is limited evidence that supports the local benefits, business impacts, or employment spillover effects that might result from subsidized economic development projects. There does appear to be some evidence that social capital and constituency might be underutilized attributes in assessing economic impact for rural and urban areas. Policymakers could utilize county type as a metric for equity when designing subsidies, narrowing eligibility or operation requirements for local residents and distressed

areas. This might allow policymakers to better account for how much subsidies interact with and produce local spillover effects.

6 Discussion

Economic growth and development are processes involving dynamic factors lacking uniformity of best practices. A lot of work has been done to establish science and principles around it but there is much more work to be done. The lack of consistent subsidy reporting standards, transparency, and data availability is a primary limitation to this type of research. Subsidy distribution research would seemingly benefit from a more thorough investigation of the additive effects that banking, crowdfunding, and angel investor networks might have on entrepreneurship, small business development, and other local spillover outcomes. Might a lack of entrepreneurial education and innovative mindsets help explain the relatively rapid onset of employment losses? Is a deficiency in local business connectivity and synergy, with larger supply chains and agglomeration economies, stifling the local establishment effect more than wage pressures? The relatively consistent positive correlations between social capital, constituent attrition, subsidy distribution, and aftereffects on employment show promise in helping to further parse out relevant socio-political and economic factors, particularly in rural and urban areas. What distinguishing factors are driving rural and urban social capital in opposite directions after the allocation of subsidies? What role do intergenerational wealth and corruption play in the relationship between social capital and constituent attrition? Further discussion and research involving local attributes would provide considerable benefit and more equitable metrics for the evaluation and implementation of more mutually beneficial and optimal subsidy policies.

Tables

Table 3.1 Annual State Subsidy Distributions

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
AL	1	0	13	10	6	4	1	4	2	3	3	1	1	1	0	50
GA	4	2	3	1	3	7	1	1	3	2	1	4	1	0	0	33
KY	5	6	7	8	5	6	7	9	8	4	6	7	4	0	0	82
MS	2	0	1	1	6	8	8	7	7	6	6	11	3	0	0	66
NC	3	2	5	8	8	8	8	9	5	5	5	7	2	0	0	75
SC	0	1	6	2	2	3	11	9	10	6	4	3	1	0	0	58
TN	1	0	1	3	3	2	9	8	11	8	3	9	3	1	1	63
VA	5	3	2	4	3	2	5	5	6	9	9	7	6	0	0	66
Total	21	14	38	37	36	40	50	52	52	43	37	49	21	2	1	493

Notes: This table shows the annual distribution of subsidies for each state within the dataset.

Table 3.2 County Type Share by State

State	N	Rural	Micro	Urban
AL	22	3	10	9
GA	10	3	1	6
KY	10	5	2	3
MS	25	18	2	5
NC	11	3	2	6
SC	23	5	6	12
TN	10	3	2	5
VA	10	4	2	4
Total	121	44	27	50

Notes: This table provides rural, micropolitan, and urban county totals for for each state.

Table 3.3 Subsidy Distribution State and County Type Totals

State	N	Rural	Micro	Urban
AL	50	5	13	32
GA	33	6	2	25
KY	82	28	23	31
MS	66	29	15	22
NC	75	14	12	49
SC	58	6	7	45
TN	63	11	9	43
VA	66	28	11	27
Total	493	127	92	274

Notes: This table shows subsidy count and county type distribution for each state.

Table 3.4 Subsidy Distribution Type by State

State	Grant	PILOT	MEGA	N
AL	29 (58%)		8(16%)	50
GA	32 (100%)			33
MS		14 (21%)		66
NC	71 (95%)			75
TN	7 (11%)	48 (75%)	6 (9%)	64

Notes: This table shows the types of subsidies distributed and percentage share within each state as available. KY, SC, and VA did not provide information.

Table 4.1 Results for Pearson's *r* analysis of $AVGWPost = \beta_0 + \beta_1 log\_SUBSD + \varepsilon$

Source	**N**	**df**	**Mean**	**Std Dev**	**Sum**
AVGWPost	493	1	0.182	0.647	89.950
log_SUBSD	493	1	16.184	1.993	7978.8
Pairwise	**Variable**	**Correlation**	**Lower**	**Upper**	**Sig.**
log_SUBSD	*AVGWPost*	0.003	-0.085	0.091	0.943

Notes: This table shows the results of the Pearson's *r* analysis for subsidy distribution and four-year aftereffect changes in annual growth for average weekly wages (as defined in Hypothesis 1.1).

Table 4.2 Results for Pearson's *r* analysis of $EMPost = \beta_0 + \beta_1 log\_SUBSD + \varepsilon$

Source	**N**	**df**	**Mean**	**Std Dev**	**Sum**
EMPost	493	1	-0.045	0.669	-22.130
log_SUBSD	493	1	16.184	1.993	7978.86
Pairwise	**Variable**	**Correlation**	**Lower**	**Upper**	**Sig.**
log_SUBSD	*EMPost*	-0.049	-0.1369	0.0393	0.276

Notes: This table shows the results of the Pearson's *r* analysis for subsidy distribution and four-year aftereffect changes in annual growth for employment (as defined in Hypothesis 1.2).

Table 4.3 Results for Pearson's *r* analysis of $CONSAT = \beta_0 + \beta_1 log\_SUBSD + \varepsilon$

Source	**N**	**df**	**Mean**	**Std Dev**	**Sum**
CONSAT	493	1	1640.98	4140.07	809003
log_SUBSD	493	1	16.1843	1.9938	7978.86
Pairwise	**Variable**	**Correlation**	**Lower**	**Upper**	**Sig.**
log_SUBSD	*CONSAT*	0.0623	-0.0261	0.1498	0.1671

Notes: This table shows the results of the Pearson's *r* analysis for subsidy distribution and increased levels of constituent attrition (as defined in Hypothesis 1.3).

Table 4.4 Results for Pearson's *r* analysis of $AVGWPost = \beta_0 + \beta_1 SKI + \varepsilon$

Source	**N**	**df**	**Mean**	**Std Dev**	**Sum**
AVGWPost	493	1	0.1825	0.6112	89.9500
SKI	493	1	-0.4469	0.6466	-220.32
Pairwise	**Variable**	**Correlation**	**Lower**	**Upper**	**Sig.**
AVGWPost	*SKI*	-0.016	-0.1040	0.0726	0.726

Notes: This table shows the results of the Pearson's *r* analysis for social capital and four-year aftereffect changes in annual growth for average weekly wages (as defined in Hypothesis 1.4).

Table 4.5 Results for Pearson's *r* analysis of $EMPost = \beta_0 + \beta_1 SKI + \varepsilon$

Source	**N**	**df**	**Mean**	**Std Dev**	**Sum**
EMPost	493	1	-0.0449	0.6686	-22.130
SKI	493	1	-0.4469	0.6112	-220.32
Pairwise	**Variable**	**Correlation**	**Lower**	**Upper**	**Sig.**
EMPost	*SKI*	-0.0355	-0.1234	0.0530	0.4317

Notes: This table shows the results of the Pearson's *r* analysis for social capital and four-year aftereffect changes in annual growth for employment (as defined in Hypothesis 1.5).

Table 4.6 Results for Pearson's *r* analysis of $CONSAT = \beta_0 + \beta_1 SKI + \varepsilon$

Source	**N**	**df**	**Mean**	**Std Dev**	**Sum**
SKI	493	1	-0.4469	0.06112	-220.32
CONSAT	493	1	1640.98	4140.07	809003
Pairwise	**Variable**	**Correlation**	**Lower**	**Upper**	**Sig.**
SKI	*CONSAT*	-0.102	-0.1886	-0.0138	0.0235**

Notes: This table shows the results of the Pearson's *r* analysis for social capital and increased levels of constituent attrition (as defined in Hypothesis 1.6). See Figure 4.1 for a scatterplot matrix output of data. Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.7 Results for $AVGWPost = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
Model	0.315	490	3	0.105	0	0.250	0.861
SKI	0.062	492	1	0.062	-.017	0.148	0.701
log_SUBSD	0.001	492	1	0.001	.001	0.001	0.988
*SKI*log_SUBSD*	0.262	492	1	0.262	-.036	0.626	0.430

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for average weekly wages (as defined in Hypothesis 2.1). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.7.1 Results for $AVGWPost_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{rural}$	0.995	123	3	0.331	0	0.857	0.466
SKI_{rural}	0.006	126	1	0.006	-.011	0.016	0.900
log_SUBSD_{rural}	0.937	126	1	0.937	-.140	2.422	0.122
$SKI*log\_SUBSD_{rural}$	0.002	126	1	0.002	-.001	0.006	0.940

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for average weekly wages in rural counties (as defined in Hypothesis 3.1). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.7.2 Results for $AVGWPost_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{micro}$	0.600	88	3	0.200	0	0.541	0.655
SKI_{micro}	0.136	91	1	0.136	.067	0.368	0.545
log_SUBSD_{micro}	0.472	91	1	0.472	-.127	1.278	0.261
$SKI*log\_SUBSD_{micro}$	0.230	91	1	0.230	.092	0.619	0.434

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for average weekly wages in micro counties (as defined in Hypothesis 3.1.2). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.7.3 Results for $AVGWPost_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{urban}$	1.176	271	3	0.391	0	0.865	0.460
SKI_{urban}	0.100	273	1	0.100	-.028	0.220	0.639
log_SUBSD_{urban}	0.738	273	1	0.738	.078	1.630	0.203
$SKI*log\_SUBSD_{urban}$	0.200	273	1	0.200	-.040	0.441	0.507

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for average weekly wages in urban counties (as defined in Hypothesis 3.1.3). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.8 Results for $EMPost = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	df	MS	β	F ratio	P value
Model	2.664	3	0.888	0	1.998	0.113
SKI	0.398	1	0.398	-.043	0.895	0.345
log_SUBSD	0.676	1	0.676	-.056	1.522	0.218
*SKI*log_SUBSD*	1.812	1	1.812	-.091	4.048	0.044**

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for employment (as defined in Hypothesis 2.2). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.8.1 Results for $EMPost_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{rural}$	3.070	124	3	1.023	0	2.633	0.053**
SKI_{rural}	0.036	126	1	0.036	-.027	0.093	0.760
log_SUBSD_{rural}	0.275	126	1	0.275	-.074	0.709	0.401
$SKI*log\_SUBSD_{rural}$	2.495	126	1	2.495	-.225	6.421	0.012

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for employment in rural counties (as defined in Hypothesis 3.2). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.8.2 Results for $EMPost_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{micro}$	0.920	88	3	0.306	0	0.993	0.399
SKI_{micro}	0.870	91	1	0.870	-.184	2.821	0.097
log_SUBSD_{micro}	0.090	91	1	0.090	.060	0.290	0.591
$SKI*log\_SUBSD_{micro}$	0.148	91	1	0.148	-.080	0.480	0.490

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for employment in micro counties (as defined in Hypothesis 3.2.2). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.8.3 Results for $EMPost_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{urban}$	1.530	271	3	0.510	0	0.993	0.397
SKI_{urban}	0.017	273	1	0.017	-.011	0.034	0.853
log_SUBSD_{urban}	0.777	273	1	0.777	-.074	1.514	0.220
$SKI*log\_SUBSD_{urban}$	0.848	273	1	0.848	-.078	1.652	0.200

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against four-year aftereffect changes in annual growth for employment in urban counties (as defined in Hypothesis 3.2.3). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.9 Results for $CONSAT = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
Model	1547	490	3	5158	0	3.047	0.028**
SKI	8768	492	1	8768	-.102	5.180	0.023**
log_SUBSD	2415	492	1	2415	.053	1.427	0.233
*SKI*log_SUBSD*	3971	492	1	3971	-.069	2.346	0.126

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against constituent attrition (as defined in Hypothesis 2.3). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.9.1 Results for $CONSAT_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{rural}$	1913	124	3	6375	0	2.577	0.063*
SKI_{rural}	1815	126	1	1815	.249	7.338	0.006***
log_SUBSD_{rural}	3269	126	1	3269	.003	0.001	0.972
$SKI*log\_SUBSD_{rural}$	2120	126	1	2120	.042	0.230	0.632

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against constituent attrition in rural counties (as defined in Hypothesis 3.3). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

Table 4.9.2 Results for $CONSAT_{micro} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{micro}$	4793	88	3	1597	0	1.017	0.388
SKI_{micro}	1668	91	1	1668	-.113	1.064	0.305
log_SUBSD_{micro}	4494	91	1	4494	-.059	0.286	0.593
$SKI*log\_SUBSD_{micro}$	1669	91	1	1669	.119	1.065	0.305

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against constituent attrition in micro counties (as defined in Hypothesis 3.3.2). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

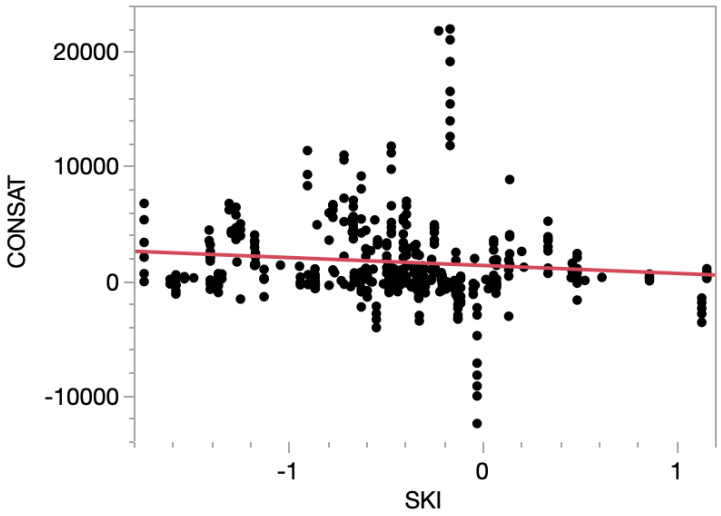
Table 4.9.3 Results for $CONSAT_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$

Source	SS	N	df	MS	β	F ratio	P value
$Model_{urban}$	1704	271	3	5681	0	2.120	0.096*
SKI_{urban}	1477	273	1	1477	-.142	5.516	0.019**
log_SUBSD_{urban}	1823	273	1	1823	-.049	0.680	0.410
$SKI*log\_SUBSD_{urban}$	9194	273	1	9194	-.035	0.343	0.558

Notes: This table shows the interaction effects of subsidy distribution and social capital tested against constituent attrition in urban counties (as defined in Hypothesis 3.3.3). Statistical significance indicated by * for $p < 0.10$, ** for $p < 0.05$, *** for $p < 0.01$.

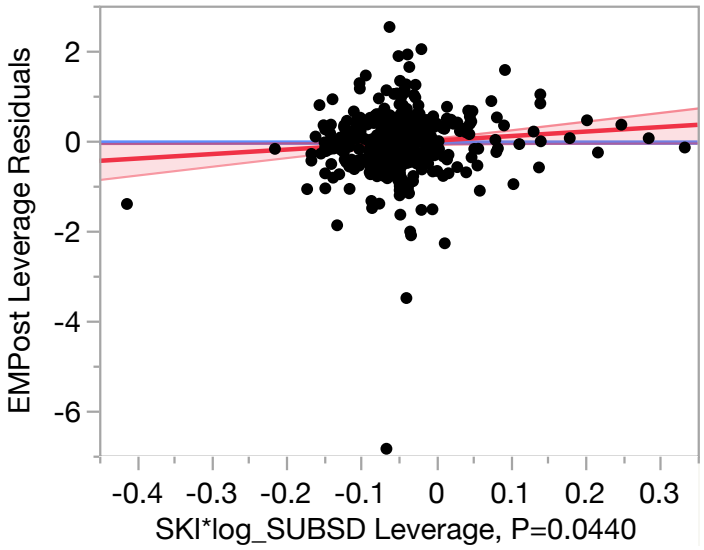
Figures

Figure 4.1 $AVGWPost = \beta_0 + \beta_1 log\_SUBSD + \varepsilon$



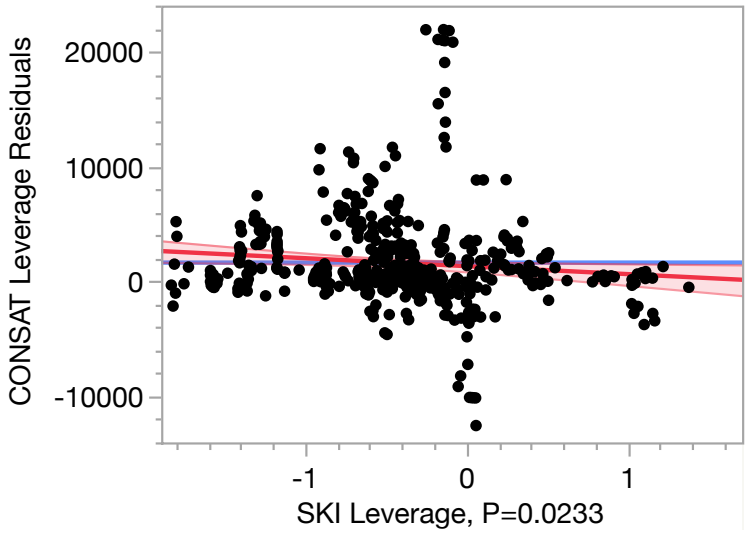
Notes: This figure is a scatterplot matrix of the Pearson's *r* analysis for subsidy distribution and four-year aftereffect changes in annual growth for average weekly wages (as defined in Hypothesis 1.1).

Figure 4.2 $EMPost = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$



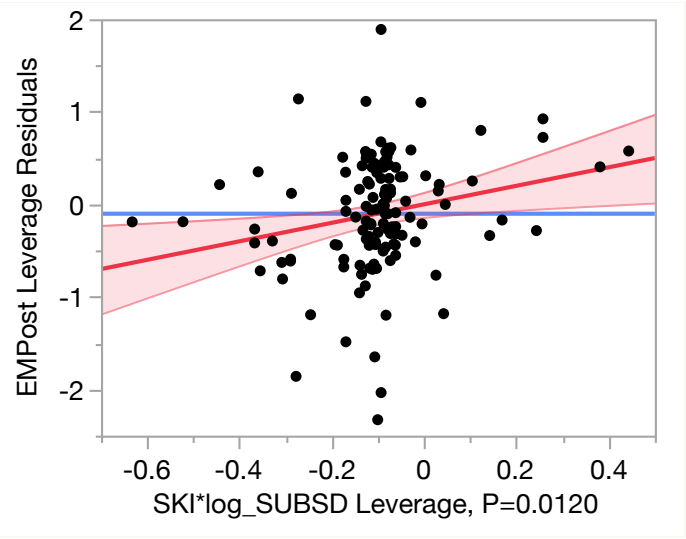
Notes: This scatterplot matrix shows interaction effects of subsidy distribution and social capital on four-year aftereffect changes in annual growth for employment (β = -.091, p = .044), (as defined in Hypothesis 2.2).

Figure 4.3 $CONSAT = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$



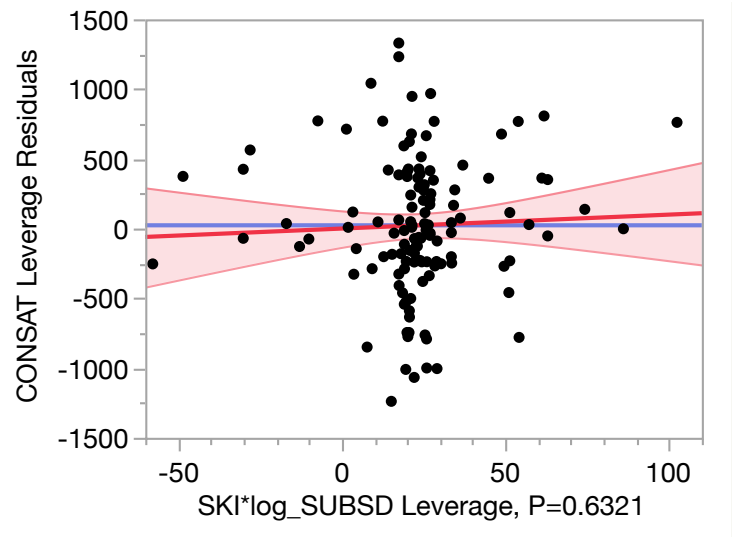
Notes: This scatterplot matrix shows constituent attrition considering subsidy distribution and social capital pairwise interaction effects (β = -.102, p = .023), (as defined in Hypothesis 2.3).

Figure 4.4 $EMPost_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$



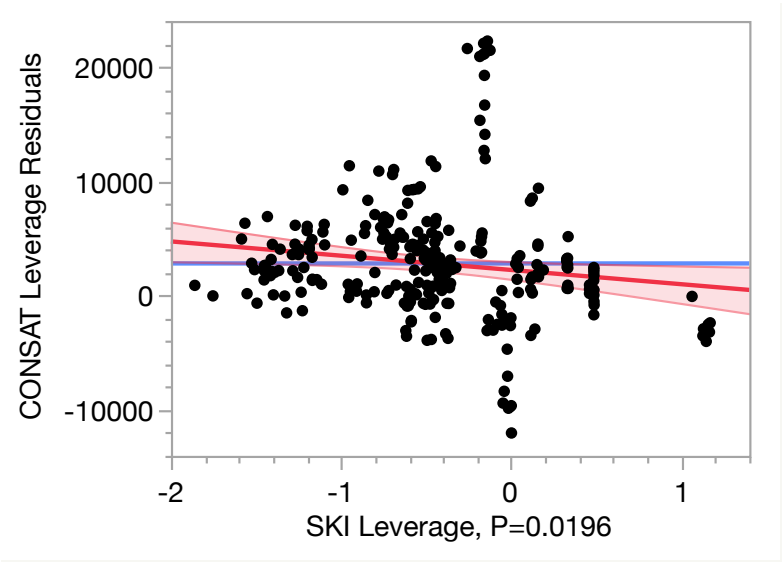
Notes: This scatterplot matrix shows the interaction effect of subsidy distribution and social capital on four-year aftereffect changes in annual growth for employment in rural counties (β = -.225, p = .012), (as defined in Hypothesis 3.2).

Figure 4.5 $CONSAT_{rural} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$.



Notes: This scatterplot matrix shows interaction effects of subsidy distribution and social capital on constituent attrition in rural counties ($\beta = .026$, $p = .770$), (as defined in Hypothesis 3.3).

Figure 4.6 $CONSAT_{urban} = \beta_0 + \beta_1 log\_SUBSD + \beta_2 SKI + \varepsilon$.



Notes: This scatterplot matrix shows social capital's correlation with constituent attrition in urban counties ($\beta = -.142$, $p = .019$), (as defined in Hypothesis 3.3.3).

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