Do Business Subsidies Lead to Increased Economic Activity?

Evidence from Arkansas's Quick Action Closing Fund

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Abstract

State governments rely heavily on targeted economic development incentives to promote economic activity. In recent years, many states have adopted targeted subsidy programs known as "deal-closing funds" to attract and retain businesses. Despite the increased use of deal-closing funds, it remains unclear whether they provide value in terms of increasing private employment and establishments. In this paper, we analyze the relationship between deal-closing funds and county-level private employment and private establishments using evidence from Arkansas's Quick Action Closing Fund (QACF). We estimate these relationships using a variety of fixed effects and ordinary least squares (OLS) techniques to measure both within-county and across-county relationships. We find little evidence to suggest that the QACF creates significant job and establishment growth. The results from this study should serve to better inform public policy across states as it relates to the use of targeted business subsidies.

JEL codes: H25, H71, O22, R38

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1. Introduction

Government intervention into economic development is quite common across the United States. State and local governments are constantly competing with each other to attract new firm locations, encourage entrepreneurship, and convince existing firms to retain jobs within their respective borders. To assist state and local officials with this endeavor, legislatures across the country have created a multitude of state-based economic development incentives. These incentives primarily allow public officials to offer a variety of tax breaks and subsidies to firms in efforts to sway location decisions.

Arkansas is no exception to this interventionism, having developed a wide array of targeted economic development incentives over the past several decades. One of the most commonly used incentives in Arkansas is a subsidy program known as the Governor's Quick Action Closing Fund (QACF). While many state politicians consider the QACF a valuable economic development tool, economists have long questioned the efficacy of targeted economic development incentives at stimulating the economy. In this paper, we analyze the relationship between the QACF and economic development in the state of Arkansas.

The QACF, established in 2007, is Arkansas's version of what is commonly known as a "deal-closing fund."[1] The fund enables the state of Arkansas to provide cash subsidies to select entities as a way to "attract new business and economic development to the state or to retain

[1] Several neighboring states have similar deal-closing funds. For instance, the Texas Enterprise Fund in Texas, the Quick Action Closing Fund in Oklahoma, the Job Creation Fund in Kansas, and the ACE Fund in Mississippi.

existing business in the state."[2] In practice, the fund has been used for both. For example, the state used a $10 million QACF subsidy to attract a new Hewlett-Packard operation to Conway as well as a $2.2 million QACF subsidy to retain the expansion of a long-standing Bad Boy Mowers operation in Batesville.

The QACF is unique relative to most of Arkansas's other targeted incentive programs in that there are very few statutory restrictions on the use of the QACF. Arkansas's other targeted incentives generally require companies to meet certain qualifications in order to be awarded the incentive (such as belonging to certain industries, being of a certain size, signing investment or job creation agreements, etc.), but the QACF does not. QACF subsidies must only be approved by the governor and subsequently reviewed by the legislative council.[3]

In other words, QACF subsidies are awarded at the discretion of the governor of Arkansas. The discretionary nature of the fund is intended to allow the "Governor to act quickly and decisively in highly competitive situations to finalize an agreement with a company to locate in Arkansas."[4] Firms in a variety of industries have received QACF subsidies, including manufacturers of wind energy products (Nordex, LM Wind Power, and Beckmann Volmer), manufacturers of firearms (SGL Carbon, Daisy Outdoor Products, and Remington Arms), telecommunications companies (Verizon, Windstream, and Allied Wireless), retailers (Dillard's and Furniture Factory Outlet), healthcare companies (Golden Living), film producers (Dempsey Film Group and Neckbone Productions), and athletic associations (Martial Arts Services), among others. Companies receiving funds from the QACF have used their subsidies for an assortment of activities, including, but not limited to, beautification, market research, facility improvements, equipment reimbursement, and working capital.

[2] *Arkansas Code Annotated* § 19-5-1231(c) (2017).
[3] *Arkansas Code Annotated* § 19–5-1231(e) (2017).
[4] Michael Preston, letter to the Arkansas Legislative Council, July 15, 2015.

Between the QACF's inception in 2007 and the end of fiscal year (FY) 2016, the Arkansas legislature appropriated a total of $156,252,000 (nominal) to the fund. Through FY 2016, the QACF was credited with creating or retaining more than 18,000 direct jobs in Arkansas.[5] However, despite the state's monitoring of the number of jobs created or retained by the firms receiving subsidies, empirical research examining the relationship between QACF subsidies and the local economy is nonexistent.

The incentive program can have three possible effects on jobs and establishments. The first is that by providing subsidies to select businesses through the QACF, government is able not only to create direct jobs but also to incite a multiplier effect that leads to additional increased economic activity. By attracting new firm locations and encouraging existing firm expansions with subsidies, other firms, such as suppliers and related businesses, may also be attracted to the area because of agglomeration effects. The increased number of firms in the local economy means that employment and consumer spending also increase. Hence, the QACF positively impacts the local economy.

The second possible effect is that providing subsidies to select businesses through the QACF leads to unintended consequences that negatively impact the local economy. For example, business subsidies may lead to higher marginal tax rates, rent-seeking, and the crowding out of existing firms. These unintended consequences ultimately hurt the local economy because they make the state a more expensive place to do business, encourage activities that add no value to the economy, and put existing firms out of business.

The third possible outcome is that the program has no effect. The firms receiving the incentive may have chosen to locate or expand in Arkansas regardless of whether or not they received QACF subsidies. Private firms have an incentive to maximize profits while politicians

[5] Michael Preston, letter to the Arkansas Legislative Council, July 15, 2016.

have an incentive to demonstrate strong economic policy to their constituents. Providing QACF subsidies to businesses even if they would have located or expanded in the state without the incentive satisfies the interests of both parties.

This paper tests these three effects by examining the relationship between the QACF and the local economy using both fixed effects and standard ordinary least squares (OLS) techniques. Broadly speaking, our results provide reason to be skeptical of the QACF as a job creator, at least at the county level. These results are important for economic development policy not only in Arkansas but also across all fifty states.

2. Literature Review

Whether state-sponsored economic development activities have an impact on the broad economy has been the subject of much debate. Proponents of economic development interventionism argue that with the right tools, government officials are able to encourage existing firms to expand operations, to recruit new firm locations, and to promote entrepreneurial activity where there may be market failures. It is ultimately argued that this intervention will lead to widespread economic benefits, thus justifying the existence of economic development incentives. However, the majority of empirical analysis to date reveals that incentives do not have clear positive benefits for the broad economy.

At the aggregate level, Goss and Phillips (1994) find that economic development agency spending has a positive relationship with state employment growth. However, Bingham and Bowen (1994) find evidence suggesting that state spending on economic development has no relationship with gross state product. More recently, Bruce et al. (2009) find that the number of tax incentives and nontax incentives that a state offers has no statistical relationship with growth in gross state product, employment, or state personal income.

Greenstone and Moretti (2003) find that attracting large, new industrial plants with incentives increases local economic activity without crowding out existing activity. However, Fox and Murray (2004, 91) find that "there is little evidence of positive or negative growth impacts associated with the location of large firms," while Edmiston (2004, 317) finds that "local governments are not likely to receive significant long-term employment or population benefits from large new firm locations."

Additional research has analyzed the efficacy of economic development incentives by categorizing programs. In doing so, Bremmer and Kesselring (1993) find evidence suggesting that state-sponsored workforce training has a positive relationship with state employment, but they find that job creation tax credits have no impact on employment. Trogen (1999, 256) finds that incentives designed to be widely available to all firms in a sector have a positive relationship with growth in state per capita income, but that incentives designed to "elicit specific firm behavior," such as job creation incentives and investment incentives, have a negative relationship with growth in per capita income. Senter (1999) also finds that state expenditures on research and development have little impact on state economic development.

Moreover, Saiz (2001) finds that incentives used for "entrepreneurial strategies" increase manufacturing employment but have no relationship with employment in wholesale, retail, finance, insurance, real estate, and service sectors. On the other hand, incentives used for "locational strategies" have a negative relationship with employment in the finance, insurance, and real estate sectors. Saiz also finds that both categories of incentives have no impact on gross state product or state unemployment.

More recently, Hoyt, Jepsen, and Troske (2008) analyze the impact of incentives on county employment by broadly categorizing Kentucky's incentives as "tax incentives," "training

incentives," or "financing incentives." They find that the impact of Kentucky's economic development incentives is felt in counties that border neighboring states but not in interior counties. Holmes (1998) and Holcombe and Lacombe (2004) also find that state policies matter for the economies of counties located along state borders. Furthermore, Hoyt, Jepsen, and Troske (2008) find that Kentucky's training incentives have a larger positive impact on county employment than tax incentives do, but that financing incentives have no statistical relationship with employment in any county. Finally, they find that the incentives received in one county do not provide spillover effects in neighboring counties.

The literature has also examined the widespread economic impact of specific incentive programs. For instance, enterprise zones (EZs), once a politically popular incentive for encouraging economic development in deteriorating neighborhoods, have been intensely studied. An evaluation of the New Jersey EZ program finds no evidence that EZs "had a positive effect on total municipal employment, on employment in various sectors, or on municipal property values" (Boarnet and Bogart 1996, 198). Similarly, an evaluation of the EZs in California, Kentucky, New York, Pennsylvania, and Virginia concludes that EZs "do not have a noticeable impact on the employment growth of the local neighborhoods immediately surrounding the zone areas" (Bondonio and Engberg 2000, 547).

More recent evidence from California's EZ program suggests that EZs not only fail to increase employment within program boundaries, but they also likely fail to produce positive spillovers into surrounding areas (Neumark and Kolko 2010). Evidence from Colorado indicates that rural EZs may have small positive employment effects, but there is no evidence of similar effects in urban EZs, and overall, the "Colorado EZP had no long-term effect on earnings" (Lynch and Zax 2011, 248).

Tax-increment financing (TIF) programs have also found little empirical support. An examination of TIF districts in metro Chicago suggests that using tax-increment financing to stimulate blighted areas comes "at the expense of the larger town" (Dye and Merriman 2000, 327). This research is supported by an analysis of TIF districts across the state of Illinois, which concludes that TIF programs generated no growth in general municipal employment (Byrne 2010). This is in part because the broad positive employment impacts of industrial TIF districts are offset by broad negative employment impacts from retail TIF districts. A more recent analysis of Chicago's TIF program again supports this notion, concluding that "on-average, across the whole city, TIF was unsuccessful in jump-starting economic development activity—relative to what would have been likely to have occurred otherwise" (Lester 2014, 671).

Property tax incentives have also been ineffective in other states. Evidence from El Paso, Texas, indicates that property tax abatements are "not effective at stimulating improvements in gross metropolitan product, residential housing values, personal income, retail sales, or jobs" (Fullerton and Aragones-Zamudio 2006, 86). In Wisconsin, evidence suggests that TIF districts fail to increase aggregate property values in the communities that adopt them (Merriman, Skidmore, and Kashian 2011).

Economic development incentives designed to promote growth in rural areas have also shown little success. For example, Minnesota created tax-free zones in all but nine counties in the Twin Cities metro through the Job Opportunity Building Zone (JOBZ) program. Yet evidence indicates that this initiative has done little in the way of promoting economic growth, at least at the county level (Hansen and Kalambokidis 2010).

Using government debt as an incentive to attract businesses is also quite common, but it has provided mixed economic results. Evidence from Minnesota's Small Cities Development

Program suggests that low-interest loans administered by local jurisdictions "created some jobs in Minnesota at high cost and some at low cost" but "did not do well at redistributing jobs to distressed areas and created principally low-wage positions that reduced regional earnings per job" (Dewar and Hagenlocker 1996, 52). However, the broad economic impact of state-level debt measures appears to be clearer, with evidence from the 50 states suggesting that state debt financing packages hurt employment growth, particularly in the Southeast and potentially the Rocky Mountain states (Riefler 1999).

This paper looks to extend previous research by examining the relationship between the subsidies from Arkansas's QACF and the state's local economies. Specifically, the analysis seeks to measure the relationship between county-level private employment and private establishments and the value of cash subsidies injected into select businesses. The results are applicable to other states, as many deploy similar deal-closing funds.

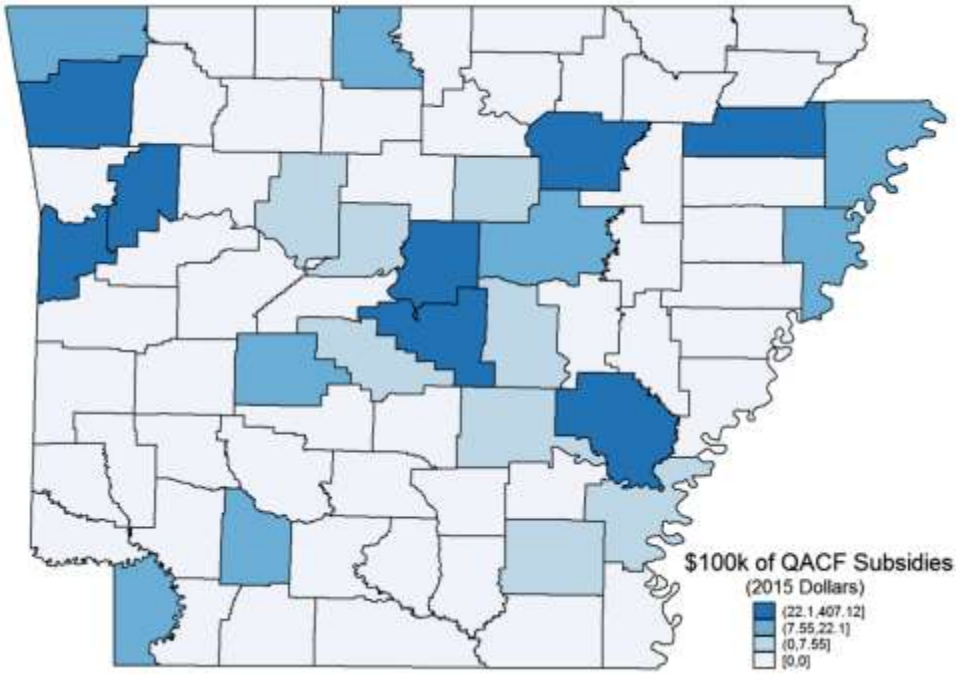
3. Quick Action Closing Fund Subsidies: Where Do They Go?

Between the program's inception in 2007 and the end of calendar year 2015, companies in 24 of Arkansas's 75 counties received subsidy money from the QACF. Over this time span, distributions from the fund amounted to more than $102.5 million, adjusted for inflation.[6] Companies in Pulaski County have received the most funding at more than $40.7 million worth of subsidies. Interestingly enough, Pulaski County is home to Arkansas's capital city of Little Rock. The five counties with companies receiving the most money from the QACF (Pulaski, Faulkner, Washington, Craighead, and Sebastian Counties) have received 76.6 percent of the

[6] Funds distributed to statewide programs, projects without a specified location, and other government agencies, namely the Arkansas Development Finance Authority (ADFA), are not included in the dataset. These funds are not traceable to specific counties based on the reporting method used to describe these disbursements in the annual reports mandated by Arkansas Act 510 of 2007. The amount of funds not included is $13.1 million in nominal terms, primarily consisting of nearly $10.26 million disbursed to ADFA for the AR Venture Capital Fund.

fund's total distributions. Figure 1 illustrates the counties where companies receiving QACF subsidies have located.

Figure 1. Counties Receiving Quick Action Closing Fund Subsidies (2007–2015)



Source: Author-generated map using Stata software and authors' own data.

Given that not all of Arkansas's counties have had companies within their borders receive QACF subsidies, it is natural to ask whether differences exist between the counties where subsidized projects have taken place and the counties where they have not. Variations in demographic and economic factors among counties may influence where QACF subsidies are allocated. To examine whether heterogeneity exists between the group of counties that are home to subsidized projects and the group of counties that are not, we analyze the populations, median household incomes, and unemployment rates in the two groups of counties in the year 2006. We use 2006 data because it is the year before the QACF was created, allowing us to avoid any

variation in the data caused by the QACF. Table 1 includes the mean, median, and two-tailed t-statistics for the two groups of counties.

Table 1. 2006 Demographics of Arkansas Counties by QACF Subsidies

Variable	Mean		Median		T-statistic
	QACF	*No QACF*	*QACF*	*No QACF*	*By QACF*
Population (2006)	77,287.08	18,958.25	54,584.50	17,027.00	−5.09
Median household income (2006)	$43,595.36	$36,355.31	$42,395.80	$35,910.95	−5.22
Unemployment rate (2006)	5.49%	6.07%	4.95%	5.70%	1.62
Number of counties	24	51	24	51	75

Source: Arkansas Department of Workforce Services via the United States Census Bureau; United States Census Bureau's Small Area Income and Poverty Estimates; Bureau of Labor Statistics' Local Area Unemployment Statistics.

The results of the t-statistics in table 1 indicate that there is a statistically significant difference in both the populations and median household incomes of counties where QACF projects have located and the populations and median household incomes of counties where they have not. However, there is no statistically significant difference in the unemployment rates of counties where QACF projects have located and the unemployment rates of counties where they have not. These results suggest that QACF subsidies are directed to Arkansas's more populous, wealthier counties but that county unemployment rates do not play a significant role. The fact that QACF subsidies are largely provided to companies locating in the state's more populous, wealthier counties is somewhat unsurprising. Arkansas is a relatively poor, rural state compared to other states competing for business locations, but the

volume of Arkansas's economic activity is generally greater in the state's larger, wealthier counties than it is in its smaller, poorer counties.

Perhaps a more important consideration, though, is how the economies of the counties home to QACF projects have performed relative to the economies of the counties without QACF projects. We can investigate this by testing for differences between the two sets of counties' respective economies. Because Arkansas's public officials closely associate the QACF with jobs and firm locations, we examine this question in terms of county-level private employment and private establishment growth. Table 2 provides the mean, median, and two-tailed t-statistics for private employment and private establishment growth from 2006 through 2015 for the two groups of counties.

Table 2. Private Employment and Establishment Growth in Arkansas Counties by QACF Subsidies

Variable	Mean		Median		T-statistic
	QACF	*No QACF*	*QACF*	*No QACF*	*By QACF*
% Δ in private employment 2006–2015	0.47	−7.66*	−0.05	−8.57*	–3.49*
% Δ in private establishments 2006–2015	5.55	0.86	4.17	−1.17	–1.93
Number of counties	24	51	24	51	75

Note: *Only 50 observations. Newton County's 2006 and 2007 data do not meet BLS or state agency disclosure standards.
Source: Bureau of Labor Statistics' Quarterly Census of Employment and Wages.

The results in table 2 indicate that there is a statistically significant difference in both the private employment growth and private establishment growth of counties where QACF projects have located and the private employment growth and private establishment growth of counties where they have not. From 2006 through 2015, counties that are home to QACF projects have

seen stronger private employment and private establishment growth than counties that are not home to QACF projects.

On one hand, it can be argued that the divide in the growth of private employment and private establishments between the two groups of counties is a result of fundamental differences between the economies of the two groups of counties. After all, QACF subsidies tend to be directed toward more populous, wealthier counties. However, it can also be argued that the divide is, in part, related to the QACF. This raises an important empirical question: do QACF subsidies have a significant relationship with county-level private employment and private establishments?

4. Limitations of Analysis

Before diving into the statistical analysis, it is important to note two caveats to examining the relationship between Arkansas's QACF and the state's local economies. First, it is difficult to determine whether QACF subsidies are truly the deciding factor in where entities decide to locate or expand. This is in large part because of the incentives driving both politicians and business leaders. Politicians who wish to be reelected frequently use the groundbreaking ceremonies of subsidized projects as evidence of successful economic policy. Likewise, business leaders who wish to maximize profits look to subsidies as a way to help achieve that endeavor. Thus, there are strong incentives for politicians and business leaders to claim that QACF subsidies are truly the deciding factor in location decisions.

However, business location decisions depend on a variety of factors outside of state aid. For instance, industry-level agglomeration effects, local amenities, human talent, and labor unionization all play significant roles in business location decisions (Head, Ries, and Swenson 1995; Gottlieb 1995; Glaeser, Kolko, and Saiz 2001; Florida 2002; Bartik 1985). Furthermore,

anecdotal evidence indicates that the QACF provides some subsidies to entities that would have located or expanded in Arkansas regardless of the grant they received. Bad Boy Mowers of Independence County is one example. In 2014, the lawnmower manufacturer received $2.2 million from the QACF to expand operations, but the company's general counsel stated that Bad Boy Mowers' expansion would have occurred regardless of the incentives from state and local governments (Fanney 2016). Thus, any local economic impact of Bad Boy Mowers' expansion likely would have occurred regardless of the money the state of Arkansas provided the company.

Nevertheless, without company leaders volunteering the information, it is difficult to determine whether the QACF played a deciding factor in each entity's location decisions. The fact that firms tend to locate in counties with higher population and greater wealth may well indicate that the QACF does not play a large role in location decisions.

Second, it is difficult to disentangle the economic impact of Arkansas's other targeted business incentives. Arkansas law allows, but does not require, the QACF to "be used in conjunction with other incentives offered by the state to attract new business or retain existing business."[7] From 1984 through 2015, Arkansas spent more than $2.06 billion, or more than $1,800 per household, on targeted business tax expenditures.[8] However, the state lacks transparency in its tax incentive programs, making it extremely difficult to trace these incentives to individual companies and the counties in which they are located. This lack of data means that we are unable to account for the influence of other targeted business incentives, in terms of both stacking them on top of QACF subsidies and using them independently of the QACF.

[7] *Arkansas Code Annotated* § 19-5-1231 (2017).
[8] Office of Excise Tax Administration, State of Arkansas Department of Finance and Administration, Revenue Division, *Business Incentives and Tax Credits Program Costs through December 31, 2015*, September 2016.

5. Quick Action Closing Fund Subsidies: Private Employment and Private Establishments

With these caveats in mind, we begin the analysis by using a panel dataset to examine the relationship between QACF subsidies and county-level private employment and private establishments. The panel dataset used in this analysis spans Arkansas's 75 counties from 2009 through 2015. Unfortunately, our panel dataset is unable to cover the entire existence of the QACF because data for our county-level independent variables only reach as far back as 2009.[9] This is because 2009 is the first year the American Community Survey began reporting Arkansas county-level statistics.

We use two outcome variables in our model: private employment per 1,000 population and private establishments per 1,000 population. Private employment and private establishments are the dependent variables because of the propensity of Arkansas's public officials to associate the QACF with creating jobs and attracting and retaining businesses. Given that Arkansas's public officials are using the QACF for this purpose, it is important to determine whether the fund has any significant relationship with private employment and private establishments.

Our model includes two variables of interest. The first variable of interest is the annual value of QACF subsidies issued within a county. To be clear, this variable is not the value of each subsidy granted but is the total value of all QACF subsidies granted to entities locating within a county's borders in a given year. This variable allows us to explore whether the level of private employment and private establishments within a county is associated with the value of QACF subsidies provided to that county's businesses. As previously noted, subsidies may create direct jobs in the county in which they are issued and incite a positive multiplier effect

[9] County-level independent variables unavailable before 2009 include percentage of the population age 25 years and older with a bachelor's degree or higher, median household income, median age, and the percentage of the population that is African American. These data were collected from the American Community Survey, which did not produce Arkansas county-level statistics before 2009.

that leads to additional economic activity within the county. However, the provision of subsidies may also create negative unintended consequences that hurt the county's overall level of economic activity.

The second variable of interest is the total annual value of QACF subsidies provided to businesses in a county's bordering counties. This variable allows us to examine spillover effects, or the relationship between subsidies issued in one county and private employment and private establishments in neighboring counties. Spillover effects are important to consider given that any effects of subsidies, whether positive or negative, are not confined by arbitrary county borders. Firms that are attracted to an area because of the location of a subsidized entity may locate in neighboring counties; subsidizing an entity in one county may increase demand for its suppliers in another county; and any increased disposable income as a result of QACF projects is not required to be spent in the same county that it was earned. All of these factors extend positive multipliers past a single county's borders.

Similarly, negative unintended consequences may also spill over into neighboring counties. QACF subsidies may provide some businesses enough of a competitive advantage to outcompete similar but nonprivileged businesses in neighboring areas. For instance, subsidies may enable privileged businesses to hire more or better labor, offer products or services at a lower cost than competing firms, or obtain cheaper credit than existing businesses. Thus, determining the value of the QACF as an economic development policy depends not only on the economic activity experienced in the county where the subsidies are directed but also on the economic activity in neighboring counties.

Following Hoyt, Jepsen, and Troske (2008), we assume that subsidies do not have an immediate impact on the local economy but rather a gradual impact. This is a reasonable

assumption given that any multiplier effects stemming from the QACF, whether positive or negative, are likely to take time to develop. Suppliers and downstream firms are not likely to move immediately following the disbursement of subsidy funds, just as competitors to subsidized firms are not likely to be put out of business immediately. For this reason, we lag the variables of interest and estimate the cumulative effects of QACF subsidies over time. It should be noted, however, that our ability to lag variables is limited by the number of years included in the dataset. Thus, for no other reason than to avoid losing too many degrees of freedom, we use only three lags.

To determine whether fixed effects or random effects estimations are appropriate, we perform the Hausman test on both specifications. In both cases, the Hausman test leads us to reject the null hypothesis that the random effects estimator is consistent, suggesting we use a fixed effects estimator. More specifically, we use a within estimator, or the mean-difference model, which controls for time-invariant unobservables that are specific to each county in the dataset. We do not include time fixed effects in our models because the economy was relatively stable during the years of our study and because including them does not make any significant difference in our results.

The within estimator allows us to determine the expected change in a given county's private employment per 1,000 population and private establishments per 1,000 population if the total value of QACF subsidies provided to businesses within the county changes by one unit ($100,000). Likewise, the model allows us to determine the expected change in a given county's private employment per 1,000 population and private establishments per 1,000 population if the total annual value of QACF subsidies provided to businesses in the county's bordering counties changes by one unit. The general model is written as

$$y_{it} - \bar{y}_i = (x_{it} - \bar{x}_i)'\beta + (\varepsilon_{it} - \bar{\varepsilon}_i), \quad (1)$$

where $i = 1, \ldots, N,$ and $t = 1, \ldots, T.$

We control for a variety of economic and demographic factors in our analysis. Control measures include the cost of labor; the education of the workforce; the rurality of counties; the wealth of counties; the age of the population; and the racial makeup of counties as measured by the percentage of the population that is African American. A description of the variables and descriptive statistics can be found in the appendix.[10] The defined equation is as follows:

$$\begin{aligned} &Private\ Employment\ per\ 1{,}000_{it} \\ &= \alpha_i \gamma_t + QACF\ Subsidy'_{it}\beta_0 + l.QACF\ Subsidy'_{it}\beta_1 + l2.QACF\ Subsidy'_{it}\beta_2 \\ &+ l3.QACF\ Subsidy'_{it}\beta_3 + QACF\ Border'_{it}\beta_4 + l.QACF\ Border'_{it}\beta_5 \\ &+ l2.QACF\ Border'_{it}\beta_6 + l3.QACF\ Border'_{it}\beta_7 \\ &+ \ln(Average\ Weekly\ Wage)'_{it}\beta_8 + Education'_{it}\beta_9 \\ &+ \ln(Population\ Density)'_{it}\beta_{10} + \ln(Median\ Household\ Income)'_{it}\beta_{11} \\ &+ \ln(Median\ Age)'_{it}\beta_{12} + Percent\ African\ American'_{it}\beta_{13} + \varepsilon_{it}. \end{aligned} \quad (2)$$

We do not estimate this model directly. Interpreting the model requires a second step. Estimating the model would inform us of the significance of the contemporaneous and lagged values of the QACF subsidies individually, but it does not inform us of the significance of the cumulative effect of all four *QACFSubsidy* variables and the cumulative effect of all four *QACFBorder* variables. That is, analyzing the individual coefficients does not inform us whether there is a sustained relationship between QACF subsidies and private employment and private establishments.

[10] For ease of interpretation, raw numbers are displayed in place of logarithmic numbers where appropriate. All dollar values have been adjusted for inflation to reflect 2015 dollars.

To determine whether QACF subsidies have a sustained relationship with county-level private employment and private establishments, we must reparametrize the equation to test for the cumulative effect of the subsidies over all four years. We reparametrize the equation by estimating the following model:

$$
\begin{aligned}
&Private\ Employment\ per\ 1{,}000_{it} \\
&\quad = \alpha_i \gamma_t + QACF\ Subsidy_{it}\theta_0 + (l.QACF\ Subsidy_{it} - QACF\ Subsidy_{it})\beta_1 \\
&\quad + (l2.QACF\ Subsidy_{it} - QACF\ Subsidy_{it})\beta_2 \\
&\quad + (l3.QACF\ Subsidy_{it} - QACF\ Subsidy_{it})\beta_3 + QACF\ Border_{it}\theta_1 \\
&\quad + (l.QACF\ Border_{it} - QACF\ Border_{it})\beta_5 + (l2.QACF\ Border_{it} \\
&\quad - QACF\ Border_{it})\beta_6 + (l3.QACF\ Border_{it} - QACF\ Border_{it})\beta_7 \\
&\quad + ln(Average\ Weekly\ Wage)'_{it}\beta_8 + Education'_{it}\beta_9 \\
&\quad + ln(Population\ Density)'_{it}\beta_{10} + ln(Median\ Household\ Income)'_{it}\beta_{11} \\
&\quad + ln(Median\ Age)'_{it}\beta_{12} + Percent\ African\ American'_{it}\beta_{13} + \varepsilon_{it}. \qquad (3)
\end{aligned}
$$

In this equation, θ_0 is the estimated four-year cumulative effect of providing subsidies to businesses within a county, or the sum of the four *QACFSubsidy* coefficients from the original model. Similarly, θ_1 is the estimated four-year cumulative spillover effect, or the combined effect of the contemporaneous and three lagged *QACFBorder* variables. Performing a t-test on each θ allows us to determine the significance level of the four-year cumulative effects. That is, it allows us to determine whether QACF subsidies have a meaningful relationship with county-level private employment and private establishments over a four-year period. The results of our reparametrized equation are found in table 3.

Table 3. Cumulative Effects of QACF Subsidies

Variables	Private Employment per 1,000	Private Establishments per 1,000
QACFSub	0.211	0.0208
	(0.192)	(0.0188)
L.QACFSub − QACFSub	0.0438	0.00634
	(0.0818)	(0.00794)
L2.QACFSub − QACFSub	0.0923	0.0163***
	(0.0689)	(0.00550)
L3.QACFSub – QACFSub	0.172***	0.000950
	(0.0615)	(0.00457)
QACFBorder	−0.00352	−0.0158*
	(0.0855)	(0.00825)
L.QACFBorder – QACFBorder	−0.00862	−0.00421
	(0.0330)	(0.00347)
L2.QACFBorder – QACFBorder	0.0519*	−0.00228
	(0.0279)	(0.00349)
L3.QACFBorder – QACFBorder	0.0421	0.000249
	(0.0280)	(0.00240)
lnAvgWkWage	67.06***	0.824
	(15.56)	(1.529)
Edu	1.045**	−0.146
	(0.522)	(0.0883)
lnPopDen	27.35	−20.88***
	(56.13)	(5.728)
lnMedHHInc	2.072	−1.258
	(13.82)	(2.251)
lnMedAge	−103.3*	2.575
	(56.89)	(5.101)
PerAA	1.271	0.110
	(1.514)	(0.103)
Constant	36.08	95.96**
	(378.8)	(40.68)
Observations	300	300
Number of counties	75	75
R^2	0.204	0.264

Note: Robust standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Source: Authors' calculations.

The results indicate that the coefficient on *QACFSub*, or θ_0, is not statistically different from zero in either the employment or establishment model. The lack of statistical significance suggests that the four-year cumulative effect of providing subsidies to businesses within a county on that county's private employment per 1,000 population and private establishments per 1,000 population is nil. In other words, this result suggests that QACF subsidies fail to promote meaningful job and establishment growth within the county to which they are directed over a four-year period.

The coefficient on *QACFBorder*, or θ_1, is also not statistically different from zero in the employment model. This means that on a four-year cumulative basis, there is no relationship between a county's private employment per 1,000 population and the total value of subsidies provided to businesses in the county's bordering counties. This result suggests that employment spillovers related to the QACF do not exist, at least over a four-year period.

However, the establishment model indicates a significant (10 percent) negative coefficient on *QACFBorder*. This means that providing subsidies to businesses in a county's bordering counties has a negative four-year cumulative effect on the county's private establishments per 1,000 population. The coefficient indicates that a $100,000 increase in the total value of QACF subsidies provided to businesses in a county's bordering counties is associated with a four-year cumulative decrease in the county's private establishments of 0.0158 establishments per 1,000 population. For an average-sized county (38,784 population), this translates to a four-year cumulative decrease of 0.6 private establishments. While the establishment spillover effect may be statistically significant, it is not economically significant.

From a policy standpoint, the results in this section largely suggest that the QACF does not have any meaningful, sustained relationship with county-level private employment and

private establishments. The four-year cumulative own-county effects of subsidies are statistically insignificant in both the employment and establishment models, while the four-year cumulative spillover effects of subsidies are statistically insignificant in the employment model, but slightly statistically significant in the establishment model.

Despite the prevalence of statistical and economic insignificance, it is nevertheless interesting to note that the coefficients on the own-county effects are positive in both the employment and establishment models, while the coefficients on the spillover effects are negative in both models. This result would appear to fit the idea that QACF subsidies crowd out existing businesses. If QACF subsidies are provided to firms in saturated markets, the artificial cost advantage given to a subsidized firm may lead to a competitive advantage that puts similar establishments in the region out of business. Subsidized businesses may also be able to attract more and better human capital at lower costs than other firms in the region as well as obtain cheaper credit than existing businesses. In summary, the results in this section provide reason to be skeptical that the QACF as an economic development policy provides meaningful employment and establishment benefits, at least at the county level.

6. Quick Action Closing Fund Subsidies: Fiscal Costs

To this point, the analysis has largely ignored the financing mechanism of QACF subsidies. However, doing so discounts the fact that the money used to provide QACF subsidies is not free. The QACF is primarily funded by transferring resources from the state's General Revenue Allotment Reserve Fund.[11] The General Revenue Allotment Reserve Fund largely consists of excess general revenues, which are primarily generated through state income and sales and use taxes. This means that the fiscal cost of the QACF is borne by individuals and

[11] *Arkansas Code Annotated* § 19-5-1231(b) (2017).

entities in all counties of the state through taxation. Using 2015 inflation-adjusted dollars, the Arkansas General Assembly appropriated $55.24 million to the QACF in 2009, $16.57 million in 2011, $20.88 million in 2013, and $20 million in 2015, for a grand total of $112.69 million.[12]

With both subsidy distributions and fiscal costs in mind, the QACF can be thought of as a tax rebate program. All counties pay into the program through taxation, but only some counties receive a rebate through subsidies. More specifically, 24 counties received at least partial rebates (subsidies) of the taxes they paid into the program, while the remaining 51 counties did not.

The fiscal costs of the QACF are important to consider because they may have negative consequences in the counties where the program is merely a cost to individuals and entities. Paying higher state taxes to fund a subsidy program without seeing tax dollars returned to the local economy may drive firms and individuals away from counties that are net payers. Therefore, the analysis in this section will consider not only the subsidies distributed from the QACF but also the taxes paid into the QACF. Regression analysis examines the relationship between net QACF payments within each county and county-level private employment and private establishments.

To determine each county's net QACF payments, we must first determine the cost of the QACF program to each county. We do this by weighting appropriations to the QACF in each year by each county's percentage of total state private employment in the same year. For clarity, consider an example using Pulaski County in the year 2009. In that year, the Arkansas General Assembly appropriated $55.24 million to the QACF. In that same year, Pulaski County was home to 20.9 percent of the state's private employees. Multiplying Pulaski County's share of

[12] $57.16 million (in 2015 dollars) was also appropriated to the QACF in 2007, the year the program began. However, this is excluded from the dataset because of the limited availability of independent variables before 2009.

private employment in that year by the state's 2009 appropriation to the QACF yields a cost of $11.54 million to taxpayers in Pulaski County.

Once the cost of the QACF to each county has been calculated, each county's net QACF payment for a given year can then be calculated by subtracting the total cost of the QACF to taxpayers within the county from the total subsidies distributed to firms within the same county. To be clear, consider the case of Pulaski County in 2009 once more. In 2009, businesses within Pulaski County received subsidies worth nearly $772,000 while Pulaski County's share of the cost of funding the QACF program totaled $11.54 million. Subtracting Pulaski County's share of the fiscal cost of the program from the value of subsidies received by businesses located within Pulaski County yields a net QACF payment of −$10.77 million for Pulaski County. This net payment calculation is the variable of interest in this section.

Similar to the previous section, we begin our analysis by performing Hausman tests to determine whether fixed effects or random effects estimations are appropriate. The Hausman tests lead us to reject the null hypothesis that the random effects estimator is consistent. This suggests that we use fixed effects estimators to analyze the relationships between net QACF payments and county-level private employment per 1,000 population and private establishments per 1,000 population. Our control variables mirror previous models.[13] The defined equation is as follows:

[13] A description of the variables and descriptive statistics can be found in the appendix. For ease of interpretation, raw numbers are displayed in place of logarithmic numbers where appropriate. All dollar values have been adjusted for inflation to reflect 2015 dollars.

$$Private\ Employment\ per\ 1{,}000_{it}$$

$$= \alpha_i \gamma_t + Net\ QACF\ Payment'_{it}\beta_0 + l.Net\ QACF\ '_{it}\beta_1$$

$$+ l2.Net\ QACF\ Payment'_{it}\beta_2 + l3.Net\ QACF\ Payment'_{it}\beta_3$$

$$+ \ln(Average\ Weekly\ Wage)'_{it}\beta_4 + Education'_{it}\beta_5$$

$$+ \ln(Population\ Density)'_{it}\beta_6 + \ln(Median\ Household\ Income)'_{it}\beta_7$$

$$+ \ln(Median\ Age)'_{it}\beta_8 + Percent\ African\ American'_{it}\beta_9 + \varepsilon_{it}. \quad (4)$$

Just as we did in the previous section, we must reparametrize our equation to determine the four-year cumulative effect of net QACF payments. The defined reparametrized equation is

$$Private\ Employment\ per\ 1{,}000_{it}$$

$$= \alpha_i \gamma_t + Net\ QACF\ Payment_{it}\theta_0 + (l.Net\ QACF\ Payment_{it}$$

$$- Net\ QACF\ Payment_{it})\beta_1 + (l2.Net\ QACF\ Payment_{it}$$

$$- Net\ QACF\ Payment_{it})\beta_2 + (l3.Net\ QACF\ Payment_{it}$$

$$- Net\ QACF\ Payment_{it})\beta_3 + ln(Average\ Weekly\ Wage)'_{it}\beta_4$$

$$+ Education'_{it}\beta_5 + ln(Population\ Density)'_{it}\beta_6$$

$$+ ln(Median\ Household\ Income)'_{it}\beta_7 + ln(Median\ Age)'_{it}\beta_8$$

$$+ Percent\ African\ American'_{it}\beta_9 + \varepsilon_{it}. \quad (5)$$

The results of the reparametrized equation are displayed in table 4. The coefficient on *NetQACF*, the four-year cumulative effect of net QACF payments, is statistically insignificant in both the employment and establishment models. This suggests that when considering both the subsidies paid out through the program and the taxes paid into the program, the QACF has no relationship with county-level private employment per 1,000 population or county-level private establishments per 1,000 population over a four-year period.

Table 4. Net QACF Payment Cumulative Effects

Variables	Private Employment per 1,000	Private Establishments per 1,000
NetQACF	0.123	0.0159
	(0.236)	(0.0201)
L.NetQACF—NetQACF	0.0649	0.0152*
	(0.0903)	(0.00816)
L2.NetQACF—NetQACF	0.0809	0.0101*
	(0.0778)	(0.00600)
L3.NetQACF—NetQACF	0.0515	0.00472
	(0.0521)	(0.00339)
lnAvgWkWage	65.61***	0.580
	(15.98)	(1.458)
Edu	0.834	−0.154*
	(0.517)	(0.0887)
lnPopDen	−21.98	−23.50***
	(59.18)	(5.669)
lnMedHHInc	1.997	−1.122
	(13.87)	(2.234)
lnMedAge	−125.1**	1.550
	(57.42)	(5.000)
PerAA	1.150	0.126
	(1.486)	(0.0979)
Constant	307.0	108.9***
	(384.5)	(39.16)
Observations	300	300
Number of counties	75	75
R^2	0.153	0.267

Note: Robust standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Source: Authors' calculations.

7. Robustness Checks

To check the robustness of our results, we examine the relationship between the QACF and private employment and private establishments using two cross-section techniques. We begin by using the between estimator. The between estimator uses only the cross-section variation in our panel data by applying the OLS estimator to the time-averaged independent and dependent variables. Whereas the within estimator allows us to determine the average effects of changes

in the QACF over time, the between estimator allows us to determine the average effects of changes in the QACF across Arkansas's counties. In other words, it allows us to determine the expected difference in two counties' private employment per 1,000 population and private establishments per 1,000 population if they differ in the total value of QACF subsidies provided to businesses within their borders by one unit. The general model for the between estimator is written as follows:

$$\bar{y}_i = \alpha + \bar{x}_i'\beta + (\alpha_i - \alpha + \bar{\varepsilon}_i), i = 1, \ldots, N. \quad (6)$$

Similar to our estimations in sections 5 and 6, we use private employment per 1,000 population and private establishments per 1,000 population as our outcome variables. Our variables of interest are once again the total value of QACF subsidies provided to businesses within each county, the total value of QACF subsidies provided to businesses within each county's bordering counties, and the net QACF payment within each county. However, given that the between estimator uses the time-averaged values of both the dependent and independent variables, we do not lag the QACF variables as we did in our within models. Our control variables remain the same.

The results for the between estimations can be found in tables A3 and A4 in the appendix. The results suggest that the total value of subsidies provided to businesses within counties has no significant relationship with differences in the number of private employees per 1,000 population and private establishments per 1,000 population among Arkansas's counties. These results support our main findings.

Similarly, we find no evidence that differences between Arkansas's county-level private establishments per 1,000 population are related to differences in the value of QACF subsidies provided to businesses in a given county's bordering counties. This result suggests an absence of

establishment spillover effects, which fails to support our main result. However, we do find that county-level private employment per 1,000 population is negatively associated with the total value of QACF subsidies provided to businesses within a given county's bordering counties. In other words, negative spillover effects related to the QACF appear to, in part, explain differences among Arkansas's county-level private employment per 1,000 population. This result is also inconsistent with our main findings.

Finally, we find no evidence that county-level private employment per 1,000 population and private establishments per 1,000 population are significantly related to net QACF payments. These results suggest that differences in each county's net QACF payments do not explain differences in each county's private employment per 1,000 population and private establishments per 1,000 population. This is consistent with our main findings.

Our second robustness check is a series of OLS models that are similar, but not identical, to the model used by Hansen and Kalambokidis (2010) to examine Minnesota's JOBZ program. Our two outcome variables are the percentage growth in county-level private employment and private establishments from 2009 through 2015. Our variables of interest are the total value of QACF subsidies provided to businesses within a county from 2009 through 2015, the total value of QACF subsidies provided to businesses in a county's bordering counties from 2009 through 2015, and the total net QACF payment within a county from 2009 through 2015. Our control measures are similar to those of our other models, except that we use a base-year statistic for each control measure and add population growth to the equations. The defined model is as follows:

$$
\begin{aligned}
&\%\Delta\ Private\ Employment\ 2009-2015_i \\
&= QACF\ Subsidy\ Total\ 2009-2015_i\beta_0 + QACF\ Border\ Total\ 2009-2015_i\beta_1 \\
&+ \#\ of\ Private\ Employees\ in\ 2009_i\beta_2 + \ln(2009\ Average\ Weekly\ Wage)_i\,\beta_3 \\
&+ 2009\ Education_i\beta_4 + \ln(2009\ Population\ Density)_i\,\beta_5 \\
&+ \%\Delta\ Population\ 2009-2015_i\beta_6 + \ln(2009\ Median\ Household\ Income)_i\beta_7 \\
&+ \ln(2009\ Median\ Age)_i\,\beta_8 + 2009\ Percent\ African\ American_i\beta_9 + \varepsilon_i. \qquad (7)
\end{aligned}
$$

The results of these models can be found in tables A5 and A6 of the appendix. We find no statistically significant relationship between the total value of QACF subsidies provided to businesses within a county from 2009 through 2015 and the percentage change in private employment over the same time period. Likewise, we find no statistically significant relationship between the total value of QACF subsidies provided to businesses in a given county's bordering counties from 2009 through 2015 and the percentage change in a county's private employment over those same years. Total net QACF payments from 2009 through 2015 also have no statistically significant relationship with the percentage change in private employment from 2009 through 2015. Results are similar when examining the relationship between the QACF and the percentage change in private establishments from 2009 through 2015. These results suggest that the QACF does not have a significant relationship with county-level private employment and private establishment growth, largely supporting our main findings.

8. Conclusion

The QACF subsidy program was created by the Arkansas legislature in 2007 as a way to attract and retain business in Arkansas. The program is unique relative to Arkansas's other targeted incentive programs in that there are very few statutory limitations to the program.

This enables the governor of Arkansas to provide subsidies to a wide range of firms and without much delay.

Given that Arkansas's politicians primarily associate the QACF with business location and job creation, we examine whether a relationship exists between the QACF and Arkansas's county-level private employment and private establishments. We estimate these relationships using a variety of fixed effects and OLS techniques to measure both within-county and across-county relationships.

Our within-county models estimate the four-year cumulative effect of QACF subsidies. These models offer no evidence to suggest that providing QACF subsidies to businesses within a given county provides the county with any significant cumulative private employment and establishment benefits. Furthermore, the models fail to offer evidence of a significant cumulative employment spillover effect related to the QACF subsidies provided to businesses in a county's bordering counties. However, we do find evidence of a statistically significant, but economically small, negative cumulative establishment spillover effect related to the QACF subsidies provided to businesses in a given county's bordering counties. Accounting for the fiscal costs of the program, though, yields no significant relationship between the QACF and county-level private employment and establishments. Finally, our cross-county estimations find little evidence to suggest that the QACF, on average, explains differences in private employment and private establishments at the county level.

The results of our investigation have important policy implications, not just for Arkansas but also for other states that use similar deal-closing funds. The evidence presented in this analysis provides reason to be skeptical of Arkansas's QACF as a job creator, at least at the county level. It is important to note that this analysis has not determined whether the QACF has

positive or negative relationships with total state employment or establishments. Further analysis of deal-closing funds at the state level is needed. Furthermore, analyses investigating the relationships between deal-closing funds and other economic indicators, such as wages, incomes, and poverty rates, would serve to better inform the policy debate surrounding the merits of deal-closing funds as an economic development incentive.

References

Bartik, T. J. 1985. "Business Location Decisions in the United States: Estimates of the Effects of Unionization, Taxes, and Other Characteristics of States." *Journal of Business & Economic Statistics* 3 (1): 14–22.

Bingham, R. D., and W. M. Bowen. 1994. "The Performance of State Economic Development Programs: An Impact Evaluation." *Policy Studies Journal* 22 (3): 501.

Boarnet, M. G., and W. T. Bogart. 1996. "Enterprise Zones and Employment: Evidence from New Jersey." *Journal of Urban Economics* 40 (2): 198–215.

Bondonio, D., and J. Engberg. 2000. "Enterprise Zones and Local Employment: Evidence from the States' Programs." *Regional Science and Urban Economics* 30 (5): 519–49.

Bremmer, D. S., and R. G. Kesselring. 1993. "The Determinants of Regional Manufacturing Investment: A Simultaneous Equations Approach." *Journal of Regional and Policy Analysis* 23 (2): 3–27.

Bruce, D., J. A. Deskins, B. C. Hill, and J. C. Rork. 2009. "(Small) Business Activity and State Economic Growth: Does Size Matter?" *Regional Studies* 43 (2): 229–45.

Byrne, P. F. 2010. "Does Tax Increment Financing Deliver on Its Promise of Jobs? The Impact of Tax Increment Financing on Municipal Employment Growth." *Economic Development Quarterly* 24 (1): 13–22.

Dewar, M. E., and B. Hagenlocker. 1996. "Getting to the Bottom Line on Low-Interest Loans to Business: An Evaluation of the Small Cities Economic Development Programme in Minnesota." *Regional Studies* 30 (1): 41–54.

Dye, R. F., and D. F. Merriman. 2000. "The Effects of Tax Increment Financing on Economic Development." *Journal of Urban Economics* 47 (2): 306–28.

Edmiston, Kelly D. 2004. "The Net Effects of Large Plant Locations and Expansions on County Employment." *Journal of Regional Science* 44 (2): 289–320.

Fanney, Brian. 2016. "State's Incentive Program Built on Promise." *Arkansas Democrat-Gazette*, January 17.

Florida, R. 2002. "The Economic Geography of Talent." *Annals of the Association of American Geographers* 92 (4): 743–55.

Fox, W., and M. Murray. 2004. "Do Economic Effects Justify the Use of Fiscal Incentives?" *Southern Economic Journal* 71 (1): 78–92.

Fullerton, T., and V. Aragones-Zamudio. 2006. “El Paso Property Tax Abatement Ineffectiveness.” *International Journal of Business and Public Administration* 3 (1): 79–94.

Glaeser, E. L., J. Kolko, and A. Saiz. 2001. “Consumer City.” *Journal of Economic Geography* 1 (1): 27–50.

Goss, E. P., and J. M. Phillips. 1994. “State Employment Growth: The Impact of Taxes and Economic Development Agency Spending.” *Growth and Change* 25 (3): 287–300.

Gottlieb, P. D. 1995. “Residential Amenities, Firm Location and Economic Development.” *Urban Studies* 32 (9): 1413–436.

Greenstone, M., and E. Moretti. 2003. “Bidding for Industrial Plants: Does Winning a ‘Million Dollar Plant’ Increase Welfare?” NBER Working Paper No. 9844, National Bureau of Economic Research, Cambridge, MA.

Hansen, T. J., and L. Kalambokidis. 2010. “How Are Businesses Responding to Minnesota’s Tax-Free Zone Program?” *Economic Development Quarterly* 24 (2): 180–92.

Head, K., J. Ries, and D. Swenson. 1995. “Agglomeration Benefits and Location Choice: Evidence from Japanese Manufacturing Investments in the United States.” *Journal of International Economics* 38 (3): 223–47.

Holcombe, R. G., and D. J. Lacombe. 2004. “The Effect of State Income Taxation on Per Capita Income Growth.” *Public Finance Review* 32 (3): 292–312.

Holmes, T. J. 1998. “The Effect of State Policies on the Location of Manufacturing: Evidence from State Borders.” *Journal of Political Economy* 106 (4): 667–705.

Hoyt, W. H., C. Jepsen, and K. R. Troske. 2008. “Business Incentives and Employment: What Incentives Work and Where?” Working Paper No. 2009–02, Institute for Federalism & Intergovernmental Relations, Lexington, KY.

Lester, T. W. 2014. “Does Chicago’s Tax Increment Financing (TIF) Programme Pass the ‘But-for’ Test? Job Creation and Economic Development Impacts Using Time-Series Data.” *Urban Studies* 51 (4): 655–74.

Lynch, D., and J. S. Zax. 2011. “Incidence and Substitution in Enterprise Zone Programs: The Case of Colorado.” *Public Finance Review* 39 (2): 226–55.

Merriman, D. F., M. L. Skidmore, and R. D. Kashian. 2011. “Do Tax Increment Finance Districts Stimulate Growth in Real Estate Values?” *Real Estate Economics* 39 (2): 221–50.

Neumark, D., and J. Kolko. 2010. “Do Enterprise Zones Create Jobs? Evidence from California’s Enterprise Zone Program.” *Journal of Urban Economics* 68 (1): 1–19.

Riefler, R. F. 1999. “State Economic Growth and Growth Policy Impact.” *Journal of Regional Analysis and Policy* 29 (1): 32–55.

Saiz, M. 2001. “Using Program Attributes to Measure and Evaluate State Economic Development Strategies.” *Economic Development Quarterly* 15 (1): 45–57.

Senter, R., Jr. 1999. “The Impact of Government Research and Development Spending and Other Factors on State Economic Development.” *Public Administration Quarterly* 23 (3): 368–84.

Trogen, P. 1999. “Which Economic Development Policies Work: Determinants of State Per Capita Income.” *International Journal of Economic Development* 1 (3): 256–79.

Appendix: Data Tables

Table A1. Description of Variables

Variable	Description
EmpPer1,000	Private employment per 1,000 population (Source: Bureau of Labor Statistics)
EstPer1,000	Private establishments per 1,000 population (Source: Bureau of Labor Statistics)
QACFSub	Total annual value of QACF subsidies within each county in $100,000 (Source: Arkansas Act 510 of 2007)
QACFBorder	Total annual value of QACF subsidies in bordering counties in $100,000 (Source: Arkansas Act 510 of 2007)
NetQACF	Total annual value of QACF subsidies within each county minus the total annual cost of the QACF program to taxpayers in each county in $100,000 (Source: Arkansas Act 510 of 2007)
lnAvgWkWage	Natural log of the average weekly wage (Source: Bureau of Labor Statistics)
Edu	Percentage of the population age 25 years and older with a bachelor's degree or higher (Source: American Community Survey 5-Year Estimates)
lnPopDen	Natural log of population density (Sources: American Community Survey 5-Year Estimates and US Census Bureau)
lnMedHHInc	Natural log of the median household income (Source: American Community Survey 5-Year Estimates)
lnMedAge	Natural log of the median age of the population (Source: American Community Survey 5-Year Estimates)
PerAA	Percentage of the population that is African American (Source: American Community Survey 5-Year Estimates)

Source: Authors' calculations.

Table A2. Descriptive Statistics (Overall)

Variable	Observations	Mean	Std. Deviation	Minimum	Maximum
EmpPer1,000	525	241.1959	98.28908	66.71432	508.4284
EstPer1,000	525	23.31384	6.151953	11.67315	41.04642
QACFSub	525	1.754919	8.216246	0	85.89136
QACFBorder	525	9.517267	20.15983	0	115.5601
NetQACF	525	−0.39164	8.908874	−107.721	79.23403
AvgWkWage*	525	626.7018	121.4459	406.7538	1080
Edu	525	14.34762	5.275995	3.1	33.6
PopDen*	525	54.19849	73.46813	8.344204	513.9294

(continued on next page)

Variable	Observations	Mean	Std. Deviation	Minimum	Maximum
MedHHInc*	525	37,164.06	6,270.187	22,695.5	56,606.73
MedAge*	525	40.25257	4.244743	30.6	51.5
PerAA	525	16.05807	17.71251	0	63.37676

* For ease of interpretability, raw numbers are displayed in place of logarithmic values.

Source: Authors' calculations.

Table A3. Between Estimator–Employment Models

Variables	Private Employment per 1,000	Private Employment per 1,000
QACFSub	1.544	
	(1.635)	
QACFBorder	−2.164***	
	(0.612)	
NetQACF		−0.159
		(2.790)
lnAvgWkWage	251.4***	296.5***
	(56.48)	(60.06)
Edu	2.861	4.912*
	(2.689)	(2.744)
lnPopDen	24.56	28.02
	(16.11)	(17.21)
lnMedHHInc	−3.779	−214.7**
	(102.3)	(91.65)
lnMedAge	−81.42	−99.20
	(99.53)	(107.9)
PerAA	−0.0619	−0.533
	(0.601)	(0.635)
Constant	−1,143	797.7
	(1,132)	(1,081)
Observations	525	525
Number of counties	75	75
R^2	0.606	0.527

Note: Standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Source: Authors' calculations.

Table A4. Between Estimator–Establishment Models

Variables	Private Establishments per 1,000	Private Establishments per 1,000
QACFSub	0.0230	
	(0.109)	
QACFBorder	−0.0417	
	(0.0407)	
NetQACF		−0.0327
		(0.171)
lnAvgWkWage	2.328	3.134
	(3.756)	(3.673)
Edu	0.411**	0.453***
	(0.179)	(0.168)
lnPopDen	2.871***	2.909***
	(1.071)	(1.053)
lnMedHHInc	−14.66**	−18.72***
	(6.806)	(5.605)
lnMedAge	11.95*	11.54*
	(6.619)	(6.596)
PerAA	0.169***	0.160***
	(0.0400)	(0.0388)
Constant	99.88	137.9**
	(75.26)	(66.09)
Observations	525	525
Number of counties	75	75
R^2	0.551	0.544

Note: Standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Source: Authors' calculations.

Table A5. Employment Growth 2009–2015 (OLS)

Variables	Percent Growth in Private Employment	Percent Growth in Private Employment
QACFSubTot	−0.00162	
	(0.0665)	
QACFBorderTot	−0.00187	
	(0.0123)	
NetQACFTot		−0.0109
		(0.0601)
PrivEmpBase	−7.77e-05	−7.44e-05
	(0.000136)	(6.19e-05)
lnAvgWkWageBase	−10.01	−10.02
	(10.74)	(10.57)
EduBase	0.651*	0.668*
	(0.367)	(0.348)
lnPopDenBase	3.041	2.912
	(2.514)	(2.545)
PopGrowth	0.0357	0.0325
	(0.288)	(0.274)
lnMedHHIncBase	11.11	10.02
	(11.70)	(7.928)
lnMedAgeBase	6.796	6.467
	(14.12)	(14.10)
PerAABase	−0.000521	−0.00375
	(0.0815)	(0.0769)
Constant	−96.26	−83.45
	(139.0)	(112.0)
Observations	75	75
R^2	0.233	0.233

Note: Robust standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Source: Authors' calculations.

Table A6. Establishment Growth 2009–2015 (OLS)

Variables	Percent Growth in Private Establishments	Percent Growth in Private Establishments
QACFSubTot	−0.00497	
	(0.0439)	
QACFBorderTot	0.0108	
	(0.00811)	
NetQACFTot		−0.00753
		(0.0368)
PrivEstBase	−0.000813	−0.000932*
	(0.00122)	(0.000485)
lnAvgWkWageBase	−2.570	−3.606
	(6.086)	(6.058)
EduBase	0.438*	0.403
	(0.259)	(0.247)
lnPopDenBase	1.134	1.141
	(1.816)	(1.784)
PopGrowth	0.0953	0.140
	(0.226)	(0.234)
lnMedHHIncBase	−5.613	−0.0282
	(12.85)	(9.934)
lnMedAgeBase	−14.71*	−13.49*
	(8.017)	(7.827)
PerAABase	0.0573	0.0816
	(0.0758)	(0.0780)
Constant	115.7	59.87
	(136.4)	(105.8)
Observations	75	75
R^2	0.242	0.223

Note: Robust standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1.

Source: Authors' calculations.