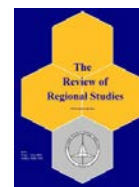# The Review of Regional Studies

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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 from Arkansas's Quick Action Closing Fund (QACF). We estimate these relationships using a variety of fixed-effects and 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.

Keywords: state government subsides, business subsidies, project analysis, deal closing funds, targeted economic development incentives

JEL Codes: H25, H71, O22

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 firms, 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 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 last 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 government to provide cash subsidies to select entities to "attract new business and economic development to the state or to retain 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 and 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 because there are very few statutory restrictions on the use of the QACF. Arkansas's other targeted incentives generally require companies to meet certain qualifications 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 primarily 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.

Between the QACF's inception in 2007 and the end of 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. First, by providing subsidies to select businesses through the QACF government is able to create direct jobs and incite a multiplier effect that leads to additional economic activity. By attracting new firms and encouraging existing firms to expand with subsidies, other firms, such as suppliers and related businesses, may also be attracted to the area because of agglomeration effects. The increased

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[1] Several neighboring states have similar deal-closing funds, such as 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.

[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

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

number of firms in the local economy means that employment and consumer spending will also increase.

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 may 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 they received QACF subsidies. Private firms have an incentive to maximize profits, while politicians 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 effects by examining the relationship between the Quick Action Closing Fund and the local economy, using both fixed effects and standard 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 not only important for economic development policy in Arkansas, but 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 incentivize new firms to locate in the area, and to promote entrepreneurial activity where there may be market failures. It is argued that this intervention will ultimately 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) found that economic development agency spending has a positive relationship with state employment growth. However, Bingham and Bowen (1994) found evidence suggesting state spending on economic development has no relationship with gross state product. More recently, Bruce et al. (2009) found that the number of tax incentives and nontax incentives a state offers has no statistical relationship with growth in gross state product, employment, or state personal income.

Greenstone and Moretti (2003) found that attracting large, new industrial plants with incentives increases local economic activity without crowding out existing activity. However, Fox and Murray (2004, p. 91) found "little evidence of positive or negative growth impacts associated with the location of large firms" while Edmiston (2004, p. 317) found 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) found evidence suggesting that state-sponsored workforce training has a positive relationship with state employment, but

found that job creation tax credits have no impact on employment. Trogen (1999) found 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) found that state expenditures on research and development have little impact on state economic development. Patrick (2016, p. 169) found that "increasing capital subsidy tools is associated with capital-labor substitution, decreased employment density, and changes in local industry mix."

Moreover, Saiz (2001) found that incentives used for "entrepreneurial strategies" increase manufacturing employment but have no relationship with employment in the 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 (2001) also found that both categories of incentives have no impact on gross state product or state unemployment.

More recently, Hoyt, Jepsen, and Troske (2008) analyzed the impact of incentives on county employment by broadly categorizing Kentucky's incentives as either "tax incentives," "training incentives," or "financing incentives." They found that the impact of Kentucky's economic development incentives was felt in counties that border neighboring states, but not in interior counties. Holmes (1998) and Holcombe and Lacombe (2004) also found that state policies matter for counties located along state borders. Furthermore, Hoyt, Jepsen, and Troske (2008) found 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 found 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 (EZ), a once politically popular incentive for encouraging economic development in deteriorating neighborhoods, have been intensely studied. An evaluation of the New Jersey EZ program found 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, p. 198). Similarly, an evaluation of the EZs in California, Kentucky, New York, Pennsylvania, and Virginia concluded 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, p. 547).

More recently, Busso, Gregory, and Kline (2013) found evidence that the federal EZ program not only increased employment in zone designated neighborhoods, but also increased wages for local workers. However, Hanson and Rohlin (2013) found that spillovers from the federal EZ program frequently more than offset the positive effects of the program. Evidence from California's EZ program also suggests that EZs fail to increase employment within program boundaries and also likely fail to produce positive spillovers into surrounding areas (Neumark and Kolko, 2010). Moreover, 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, p. 248).

The New Market Tax Credit (NMTC), a federal program providing tax incentives to businesses investing in low-income communities, has also garnered attention. Freedman (2015)

found that the benefits of the NMTC to eligible communities are weakened as a result of subsidized businesses hiring employees that do not reside in the communities targeted by the program. Harger and Ross (2016) found that the NMTC led to a sorting of industries across eligible and non-eligible census tracts. Census tracts eligible for the NMTC experience an increase in employment at new and existing retail entities and existing manufacturing entities but a decrease in employment at new wholesale and transportation businesses and a decrease in the number of new FIRE and service firms. Freedman and Kuhns (2016) found that the NMTC modestly increased supermarket entry into low-income communities, but that it did not necessarily increase the total number of supermarkets.

Tax increment financing (TIF) programs have found little empirical support. An examination of TIF districts in the Chicago metropolitan area suggested that using tax increment financing to stimulate blighted areas came "at the expense of the larger town" (Dye and Merriman, 2000, p. 327). This research is supported by an analysis of TIF districts across the state of Illinois, which concluded 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 jumpstarting economic development activity – relative to what would have been likely to have occurred otherwise" (Lester, 2014, p. 671). Moreover, evidence from Missouri's counties suggests that "TIF-supported jobs either come at the expense of other areas in the county or would have located in the county regardless of the existence of Missouri's TIF districts" (Byrne, 2017, p. 27).

Property tax incentives have also been ineffective in some areas. Evidence from El Paso 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, p. 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 at promoting 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 metropolitan area 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 results. Evidence from Minnesota's Small Cities Economic Development Program suggests 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, p. 52). However, the broad economic impact of state-level debt measures appears to be clearer, with evidence from all fifty 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 the previous research by examining the relationship between the subsidies from Arkansas's Quick Action Closing Fund and the state's local economies.

Figure 1: Counties Receiving Quick Action Closing Fund Subsidies (2007-2015)
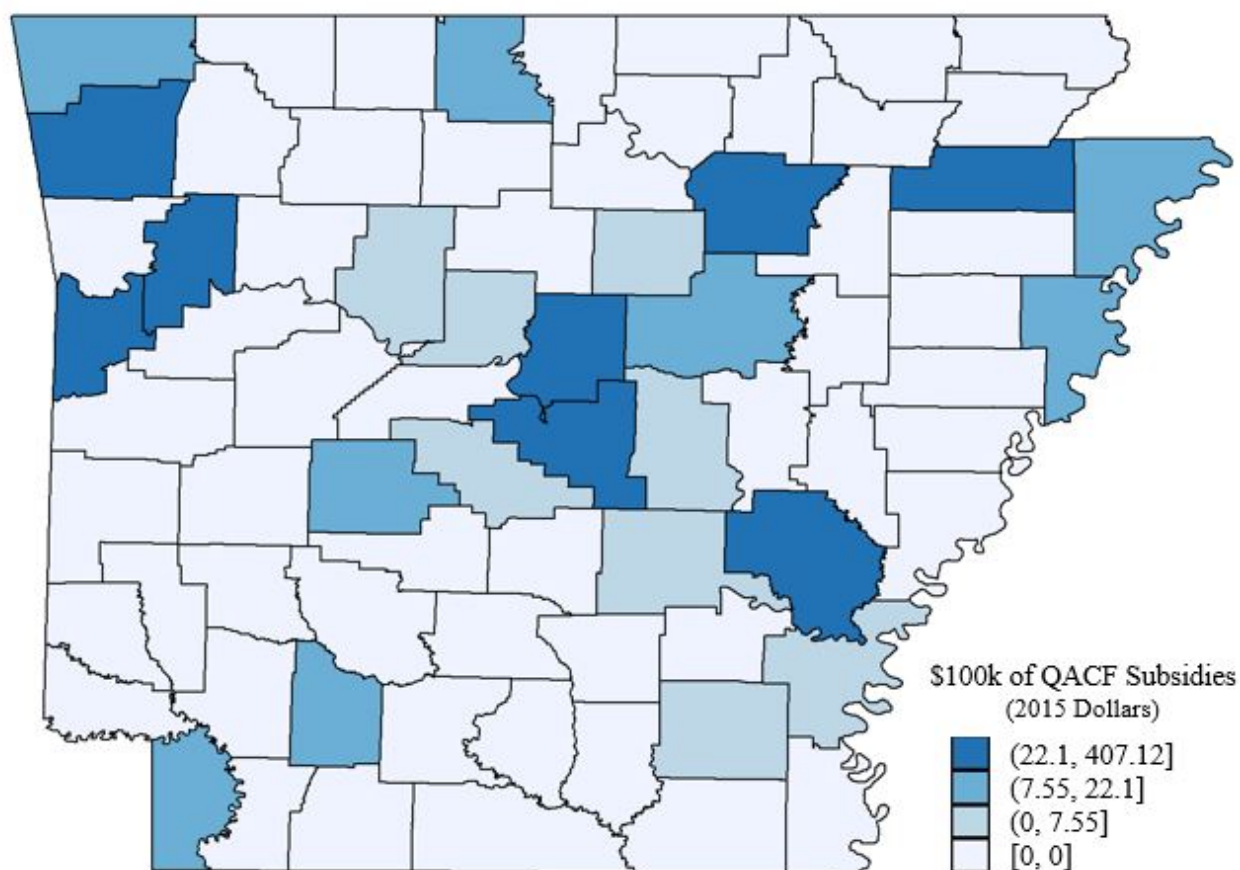
Specifically, the analysis seeks to measure the relationship between county-level private employment and private establishments and the value of cash subsidies injected into select businesses. The results are likely applicable to other states, as many deploy similar deal-closing funds.

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 Quick Action Closing Fund. 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, 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

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[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 data. 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 Arkansas Venture Capital Fund.

Table 1: 2006 Demographics of Arkansas Counties by QACF Subsidies

Variable	Mean		Median		t-stat
	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 U.S. Census Bureau; U.S. Census Bureau's Small Area Income and Poverty Estimates; Bureau of Labor Statistics' Local Area Unemployment Statistics.

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

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 between 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 population, median household incomes, and unemployment rates in the two groups of counties in 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.

The t-statistics in Table 1 indicate a statistically significant difference in both the population and median household incomes of counties where QACF projects have located versus counties where they have not. However, we find no statistically significant difference in the unemployment rates of counties where QACF projects have located versus those 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. 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 as 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 in its smaller, poorer counties.

Perhaps a more important consideration is how the counties home to QACF projects have performed relative to 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 establishment growth from 2006 through 2015 for the two groups of counties.

The results in Table 2 indicate a statistically significant difference in both the private employment growth and establishment growth of counties where QACF projects have located

Table 2: Private Employment/Establishment Growth in Arkansas Counties by QACF Subsidies

Variable	Mean		Median		t-stat
	QACF	No QACF	QACF	No QACF	By QACF
% Δ in Private Employment 2006-15	0.47	−7.66*	−0.05	−8.57*	−3.49*
% Δ in Private Establishments 2006-15	5.55	0.86	4.17	-1.17	−1.93
Number of Counties	24	51	24	51	75

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

versus counties where they have not. From 2006 through 2015, counties home to QACF projects have seen stronger private employment and private establishment growth than counties not home to QACF projects.

On the 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. After all, QACF subsidies tend to be directed toward more populous, wealthier counties. On the other hand, 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 THE 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 that wish to be reelected frequently use the ground breaking ceremonies of subsidized projects as evidence of successful economic policy. Likewise, business leaders that wish to maximize profits look to subsidies to help achieve that endeavor. Thus, strong incentives motivate 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 some QACF subsidies are provided to entities that would have located or expanded in Arkansas regardless of the grant. 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.[7] Thus, any local economic impact of Bad Boy Mowers' expansion would have likely occurred regardless of the money the state of Arkansas provided.

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[7] Brian Fanney, "State's incentive program built on promise," *Arkansas Democrat-Gazette,* Jan 17, 2016

Nevertheless, without company leaders volunteering this information, it is difficult to determine whether the QACF played a deciding factor in each entity's location decisions. The fact that firms generally 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."[8] From 1984 through 2015, Arkansas spent more than $2.06 billion, or more than $1,800 per household, on targeted business tax expenditures.[9] 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 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.

5. QUICK ACTION CLOSING FUND SUBSIDIES: PRIVATE EMPLOYMENT AND PRIVATE ESTABLISHMENTS

With these caveats in mind, we begin the analysis by using a panel data set to examine the relationship between QACF subsidies and county-level private employment and private establishments. The panel data used in this analysis spans Arkansas's 75 counties from 2009 through 2015. Unfortunately, our data set is unable to cover the entire existence of the QACF because data for our county-level independent variables is only available back to 2009.[10] 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 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 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.

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[8] Arkansas Code Annotated § 19–5-1231(d) (2017)

[9] "Business Incentives and Tax Credits Program Costs Through December 31, 2015", Office of Excise Tax Administration, State of Arkansas Department of Finance and Administration Revenue Division, September 2016. Adjusted for inflation using 2016 dollars.

[10] County-level independent variables unavailable prior to 2009 include percentage of the population aged 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.

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 attracted to an area because of the location of a subsidized entity may locate in neighboring counties. Therefore, subsidizing an entity in one county may increase demand for its suppliers in an adjacent, nearby county. Also, any increased disposable income due to QACF projects is not required to be spent in the same county that it was earned. All of these factors suggest there may be positive multipliers past a single county's borders.

Similarly, negative unintended consequences may also spillover into neighboring counties. QACF subsidies may provide businesses that receive subsidies 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 subsidies do not have an immediate impact on the local economy, but 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 data set. Thus, for no other reason than to avoid losing too many degrees of freedom, we only use three lags.

To determine whether a fixed effects or random effects model is 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 should use a fixed effects model. More specifically, we use a within estimator, or the mean-difference model, which controls for time invariant unobservables specific to each county. 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 significantly impact 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. 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:

(1) $\boldsymbol{y_{it}} - \boldsymbol{\bar{y}_i} = (\boldsymbol{X_{it}} - \boldsymbol{\bar{X}_i})'\boldsymbol{\beta} + (\boldsymbol{\varepsilon_{it}} - \boldsymbol{\bar{\varepsilon}_i})$, where $\boldsymbol{i} = 1, \dots, N$, and $\boldsymbol{t} = 1, \dots, T$.

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. A description of the variables and descriptive statistics can be found in Appendix Tables A1 and A2.[11] The estimating equation is as follows:

(2) $Employ_{it} = \alpha_i + \sum_{j=0}^{3} \gamma_j\, QACFSubsidy_{it-j} + \sum_{j=0}^{3} \delta_j\, QACFBorder_{it-j} + \beta X_{it} + \varepsilon_{it}$

We do not estimate this model directly. Interpreting the model requires a second step. Estimating the above model would inform us of the significance of the contemporaneous and lagged values of the QACF subsidies individually, but would 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, on the one hand, and private employment and private establishments, on the other.

To determine whether Quick Action Closing Fund 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:

(3) $Employ_{it} = \alpha_i + \theta_0 QACF\ Subsidy_{it} + \sum_{j=1}^{3} \gamma_j\left(QACFSubsidy_{it-j} - QACF\ Subsidy_{it}\right) + \theta_1 QACF\ Border_{it} + \sum_{j=1}^{3} \delta_j\left(QACFBorder_{it-j} - QACF\ Border_{it}\right) + \beta X_{it} + \varepsilon_{it}$

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.

The results in Table 3 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 not statistically different from zero. In other words, this result suggests QACF subsidies fail to promote meaningful job and establishment growth within the county they are directed to 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 employment spillovers related to the QACF do not exist, at least over a four-year period.

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[11] 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 the value of 2015 dollars.

Table 3: Cumulative Effects of QACF Subsidies

Variables	Private Employment Per 1,000 Population	Private Establishments Per 1,000 Population
QACFSub	0.211	0.0208
	(0.192)	(0.0188)
L.QACFSub - QACFSub	0.0438	0.0063
	(0.0818)	(0.0079)
L2.QACFSub – QACFSub	0.0923	0.0163***
	(0.0689)	(0.0055)
L3.QACFSub – QACFSub	0.1720***	0.0010
	(0.0615)	(0.0046)
QACFBorder	-0.0035	-0.0158*
	(0.0855)	(0.0083)
L.QACFBorder - QACFBorder	-0.0086	-0.0042
	(0.0330)	(0.0035)
L2.QACFBorder - QACFBorder	0.0519*	-0.0023
	(0.0279)	(0.0035)
L3.QACFBorder - QACFBorder	0.0421	0.0002
	(0.0280)	(0.0024)
Ln(Avg Weekly Wage)	67.06***	0.8240
	(15.56)	(1.529)
Education	1.045**	-0.1460
	(0.5220)	(0.0883)
Ln(Population Density)	27.35	-20.88***
	(56.13)	(5.728)
Ln(Median HH Income)	2.072	-1.258
	(13.82)	(2.251)
Ln(Median Age)	-103.30*	2.575
	(56.89)	(5.101)
Percent African American	1.271	0.1100
	(1.514)	(0.1030)
Observations	300	300
Number of Counties	75	75
R^2	0.204	0.264

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

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 significant in the establishment model.

Despite the prevalence of statistical and economic insignificance, it is 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 and 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 funded by transferring resources from the state's General Revenue Allotment Reserve Fund.[12] The General Revenue Allotment Reserve Fund largely consists of excess general revenues, which are primarily generated through state income, sales, and use taxes. This means that the fiscal cost of the QAFC is borne by individuals and 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.[13]

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 not only consider the subsidies distributed from the QACF, but 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

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[12] Arkansas Code Annotated § 19-5-1231(b) (2017)

[13] In 2015 dollars, $57.16 million was also appropriated to the QACF in 2007, the year the program began. However, this is excluded from the data set because of the limited availability of control variables prior to 2009.

by each county's percentage of total state private employment in the same year. For example, consider Pulaski County in 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 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. Again, consider Pulaski County in 2009. 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 should 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.[14] The defined equation is below.

(4) $\quad\quad\quad\quad Employ_{it} = \alpha_i + \sum_{j=0}^{3} \gamma_j \, Net \, QACF \, Payment_{it-j} + \beta X_{it} + \varepsilon_{it}$

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:

(5) $\quad Employ_{it} = \alpha_i + \theta_0 Net \, QACF \, Payment_{it} + \sum_{j=1}^{3} \gamma_j \left(Net \, QACF \, Payment_{it-j} - Net \, QACF \, Payment_{it} \right) + \beta X_{it} + \varepsilon_{it}$

The results of the reparametrized equation are presented 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.

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-sectional techniques. We begin by using the between estimator. The between estimator uses only the cross-sectional variation in our panel data by applying the OLS estimator to the time-averaged independent and

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[14] 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 the value of 2015 dollars.

Table 4: Net QACF Payment Cumulative Effects

Variables	Private Employment Per 1,000 Population	Private Establishments Per 1,000 Population
NetQACF	0.123	0.0159
	(0.236)	(0.0201)
L.NetQACF – NetQACF	0.0649	0.0152*
	(0.0903)	(0.0082)
L2.NetQACF – NetQACF	0.0809	0.0101*
	(0.0778)	(0.0060)
L3.NetQACF – NetQACF	0.0515	0.0047
	(0.0521)	(0.0034)
Ln(Avg Weekly Wage)	65.61***	0.5800
	(15.98)	(1.458)
Education	0.8340	-0.1540*
	(0.517)	(0.0887)
Ln(Population Density)	-21.98	-23.50***
	(59.18)	(5.669)
Ln(Median HH Income)	1.997	-1.122
	(13.87)	(2.234)
Ln(Median Age)	-125.10**	1.550
	(57.42)	(5.000)
Percent African American	1.150	0.1260
	(1.486)	(0.0979)
Observations	300	300
Number of Counties	75	75
R^2	0.153	0.267

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

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:

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

Similar to 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 previously. 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 between 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 between 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 and 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 Kalambakidis (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 to 2015. Our variables of interest are the total value of QACF subsidies provided to businesses within a county from 2009 to 2015, the total value of QACF subsidies provided to businesses in a county's bordering counties from 2009 to 2015, and the total net QACF payment within a county from 2009 to 2015. Our control measures are similar to 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:

(7) $$\%\Delta\ Private\ Employment_i = \gamma_0 QACF\ Subsidy\ Total_i + \delta_0 QACF\ Border\ Total_i + \beta X_{it} + +\varepsilon_i$$

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 to 2015 and the percentage change in private employment over the same 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 to 2015 and the percentage change in a county's private employment over those same years. Total net QACF payments from 2009 to 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 to 2015. These results suggest the QACF does not have a significant relationship with county-level private employment and establishment growth, largely supporting our main findings.

8. CONCLUSION

The Quick Action Closing Fund subsidy program was created by the Arkansas legislature in 2007 to attract and retain businesses. The program is unique relative to Arkansas's other targeted incentive programs in that the program has very few statutory limitations. 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, on the one hand, and Arkansas's county-level private employment and private establishments, on the other. 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 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 establishments at the county level.

Our results have important policy implications, not just for Arkansas, but 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. Still, future work has much to consider. First, it is important to note that this analysis has not determined whether the QACF has a positive or negative relationship with total state employment or establishments. Further analysis of deal-closing funds at the state level is needed. Second, our analysis only examines two aspects of county-level economies. Future analyses should investigate the relationships between deal-closing funds and other important economic indicators, such as wages, incomes, and poverty rates. Third, the OLS assumption that individual observations are independent may be violated given the possible interaction between neighboring counties. Incorporating spatial econometric techniques in future work would thus be beneficial. Finally, endogeneity concerns still exist. Future work should examine the relationships between the QACF and broad economic activity using identification strategies that better address endogeneity.

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APPENDIX

Table A1: Description of Variables

Variable	Description
EmpPer1000	Private employment per 1,000 population (Source: Bureau of Labor Statistics)
EstPer1000	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 (Source: American Community Survey 5-Year Estimates/U.S. 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	Percent of the population that is African-American (Source: American Community Survey 5-Year Estimates)

Table A2: Descriptive Statistics (Overall)

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
EmpPer1000	525	241.20	98.29	66.71	508.43
EstPer1000	525	23.31	6.15	11.67	41.05
QACFSub	525	1.75	8.22	0.00	85.89
QACFBorder	525	9.52	20.16	0.00	115.56
NetQACF	525	-0.3916	8.91	-107.72	79.23
Avg Weekly Wage	525	626.70	121.45	406.75	1,080.00
Education	525	14.35	5.28	3.10	33.60
Population Density	525	54.20	73.47	8.34	513.93
Median HH Income	525	3,7164.06	6,270.19	22695.50	56,606.73
Median Age	525	40.25	4.24	30.60	51.50
% African American	525	16.06	17.71	0.00	63.38

Table A3: Between Estimator – Employment Models

Variables	Private Employment Per 1,000 Population	Private Employment Per 1,000 Population
QACFSub	1.544	
	(1.635)	
QACFBorder	-2.164***	
	(0.612)	
NetQACF		-0.1590
		(2.790)
Ln(Avg Weekly Wage)	251.40***	296.50***
	(56.48)	(60.06)
Education	2.861	4.912*
	(2.689)	(2.744)
Ln(Population Density)	24.56	28.02
	(16.11)	(17.21)
Ln(Median HH Income)	-3.779	-214.7**
	(102.30)	(91.65)
Ln(Median Age)	-81.42	-99.20
	(99.53)	(107.90)
Percent African American	-0.0619	-0.5330
	(0.6010)	(0.6350)
Observations	525	525
Number of Counties	75	75
R^2	0.606	0.527

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A4: Between Estimator – Establishment Models

Variables	Private Establishments Per 1,000 Population	Private Establishments Per 1,000 Population
QACFSub	0.0230	
	(0.1090)	
QACFBorder	-0.0417	
	(0.0407)	
NetQACF		-0.0327
		(0.1710)
Ln(Avg Weekly Wage)	2.328	3.134
	(3.756)	(3.673)
Education	0.4110**	0.4530***
	(0.179)	(0.168)
Ln(Population Density)	2.871***	2.909***
	(1.071)	(1.053)
Ln(Median HH Income)	-14.66**	-18.72***
	(6.806)	(5.605)
Ln(Median Age)	11.95*	11.54*
	(6.619)	(6.596)
Percent African American	0.1690***	0.1600***
	(0.0400)	(0.0388)
Observations	525	525
Number of Counties	75	75
R^2	0.551	0.544

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5A: Employment Growth 2009-2015 (OLS)

Variables	Percent Growth in Private Employment	Percent Growth in Private Employment
QACFSubTot	-0.0016	
	(0.0665)	
QACFBorderTot	-0.0019	
	(0.0123)	
NetQACFTot		-0.0109
		(0.0601)
PrivEmpBase	-7.77e-05	-7.44e-05
	(0.0001)	(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	-0.0005	-0.0038
	(0.0815)	(0.0769)
Observations	75	75
R^2	0.233	0.233

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

	Table 6A: Establishment Growth 2009-2015 (OLS)	
Variables	Percent Growth in Private Establishments	Percent Growth in Private Establishments
QACFSubTot	-0.0050 (0.0439)	
QACFBorderTot	0.0108 (0.0081)	
NetQACFTot		-0.0075 (0.0368)
PrivEstBase	-0.0008 (0.0012)	-0.0009* (0.0005)
lnAvgWkWageBase	-2.570 (6.086)	-3.606 (6.058)
EduBase	0.4380* (0.259)	0.4030 (0.247)
lnPopDenBase	1.134 (1.816)	1.141 (1.784)
PopGrowth	0.0953 (0.226)	0.1400 (0.234)
lnMedHHIncBase	-5.613 (12.85)	-0.0282 (9.934)
lnMedAgeBase	-14.71* (8.017)	-13.49* (7.827)
PerAABase	0.0573 (0.0758)	0.0816 (0.0780)
Observations	75	75
R^2	0.242	0.223

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$