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Abstract: This paper considers whether Texas should serve as the economic policy model for Oklahoma, particularly in terms of reducing or eliminating the state income tax. I compare Oklahoma's recent economic performance to that of Texas and other adjacent states. Comparisons are made at both the state and county levels, for different time periods, and for several economic indicators. County level regression analysis, of all counties, and separately for only border counties, both explicitly and implicitly controls for potential non-policy growth influences. Overall, I conclude that there is not sufficient evidence to warrant Oklahoma emulating Texas economic policies.

Keywords: state income tax, Oklahoma, Texas
JEL Codes: R51; R58; H30

1. INTRODUCTION

Although long debated, the issue of whether state income taxation affects economic growth heated up in 2012 as a number of states considered repealing or reducing their personal income tax rates (Wall Street Journal, 2012b). In Oklahoma, Republican Governor Mary Fallin proposed lowering the top state personal income tax rate from 5.25 percent to 3.5 percent as part of a long-run strategy to eliminate the state income tax, with proposed revenue offsets to be obtained by eliminating numerous state tax credits (Wall Street Journal, 2012a). Despite significant Republican majorities in the legislature, the measure failed. Intense lobbying by special interest groups preserved the tax credits proposed for elimination, and tax burdens would have increased for some Oklahomans; increased tax burdens on some households might have been interpreted as violating the state constitutional requirement of three-fourths approval in the House and Senate for enactment of tax increases (Wertz, 2012).

Oklahoma experienced the third largest drop in per pupil spending during Fiscal Years 2008-2013 (Oliff et al., 2012). According to the Tax Foundation (2013), Oklahoma had only the 36th highest state and local tax burden as a share of income in Fiscal Year 2010. Correspondingly, compared to the nation, Oklahoma raised lower shares of state and local tax revenue from the personal income tax, corporate income tax and property tax, while it was in the top ten states in terms of the sales tax share (Tax Foundation, 2013). Yet, early in the 2013

legislative session, the Oklahoma Senate passed legislation reducing the top rate from 5.25 to 4.75 percent, offsetting revenue losses by reducing tax credits, while sponsored bills in the House would reduce the rate from 5.25 to 5 percent, without any offsets in revenue (Murphy, 2013).

Just to the north of Oklahoma, Kansas reduced the top personal income tax rate from 6.45 percent to 4.9 percent in 2012 and eliminated the tax for approximately 190,000 small businesses, without broadening the base, with a proposal in 2013 designed to eventually reduce the rate to 3.5 percent with proposed offsets by raising the state sales tax (Malm and Henchman, 2013; Morris, 2013). The reduction of the income tax rate contributed to subsequent projected budget shortfalls (Shields, 2012), a fact acknowledged by Kansas Governor Brownback (Hanna, 2013). Similar proposals were introduced in other states with significant GOP influence: Indiana, Louisiana, Nebraska, North Carolina and Ohio (King and Peters, 2013).

Texas typically serves as the model of economic success for states considering eliminating or reducing their state income tax (Wall Street Journal, 2012b; Jones, 2013). Oklahoma, in particular, routinely tends to measure itself against Texas (McGuigan, 2013). In proposing the income tax reduction during her State of the State address in 2012, Oklahoma Governor Fallin indicated that under the proposal Oklahoma would have the lowest state personal income tax outside of Texas, and that eventually Oklahoma should join Texas in not having any income tax. Likewise, in proposing reducing the state income tax, Kansas Governor Brownback stated that "…the goal is for our economy to look more like Texas, and a lot less like California" (Wall Street Journal, 2012b). The Texas experience also was a cornerstone of Texas Governor Rick Perry's bid for the presidency and routinely arises in debate over state economic performance (Semuels, 2011; Flentje, 2012).

Proponents of the Texas model point to its generally stronger employment and population growth (Wall Street Journal, 2012b). Others counter by highlighting the lower per capita income growth and higher unemployment and poverty in Texas (Semuels, 2011; Flentje, 2012). The use of Texas for comparison to other states also has been questioned because of its unique

geographic and demographic characteristics such as its border location and related international trade and immigration, available land and lending regulations that keep housing prices low, and historically abundant oil and gas resources (McNichol and Johnson, 2012). Texas also contains large metropolitan areas not matched in Oklahoma.

Conflicting opinions have appeared in the press on whether lower state income taxes or their absence spurs economic growth. Laffer and Moore (2012) argued that states without income taxes historically have had stronger economic growth. The Institute on Taxation and Economic Policy (2012a) contends that the states with the highest income tax rates outperformed the rest during the previous decade, while those without an income tax performed worst. Reviews of the academic literature on state and local fiscal policies and growth have concluded that the evidence is widely varying and inconclusive (Bartik, 1991; Wasylenko, 1997).

Academic studies of state and local fiscal policies vary widely in their methodologies and scope, with each approach possessing advantages and disadvantages. Methodological issues arise that can affect the estimated relationship between policy and outcomes, which include: accounting for other economic growth influences; accurately measuring regional fiscal policy; capturing the time lag between policy and outcomes; addressing the potential endogeneity of policies to economic conditions; allowing for heterogeneity of responses across space; and allowing for potential non-constancy of policy effects across time. These issues are addressed to different extents across studies; hence, not surprisingly then the studies produce varying findings. The study used as the basis for the Oklahoma state income tax proposal (Arduin, Laffer and Moore Econometrics, 2011) has been (correctly) criticized for either not, or poorly, addressing these issues (Institute on Taxation and Economic Policy, 2012b; Maxwell, 2012; McGuigan, 2012; Olson, 2012; Shaw, 2012).

Therefore, in this study I examine the empirical basis for Oklahoma to eliminate its income tax. I compare the recent economic performance of Oklahoma to its neighbors, and Texas in particular because of its prominence in recent debates about state income taxes. I examine several economic indicators because the use of any single economic indicator can lead

to an incomplete and incorrect portrait of regional economic well-being (Partridge and Rickman, 1999; 2003). Because of the focus on growth in the policy debate, growth in the various economic indicators is examined, not the extent to which policy differences have been capitalized into factor prices. Full capitalization of existing and anticipated policy differences would cause growth to be equal across areas (Partridge et al., 2008a); however, a recent review of the relevant empirical literature suggests that this does not occur broadly across U.S. regions in a timely manner (Partridge et al., 2012a).

Because of concerns for state comparisons generally, I also specifically compare the economic performance of Oklahoma counties with those in the neighboring states, while controlling for factors that potentially produce the different outcomes observed at the state level. Yet, because there may be additional unaccounted for differences that influence the outcomes, I also examine counties that lie along the Oklahoma border. To further address the issue of Texas, I then focus on counties along the Oklahoma-Texas border, including examining counties in the panhandle separately to produce a quasi-matched comparison of Oklahoma-Texas counties. If state policies affect the location of activity, the effects could be greatest at the border as households and firms readily locate to nearby counties just across state borders, and still have the same relative proximity to desired markets and transportation networks.

I find that careful consideration of a wider selection of economic indicators and analysis of counties to control for exogenous differences in characteristics potentially related to economic performance, suggests that the Texas economy has not generally outperformed the Oklahoma economy. Therefore, it is misguided and potentially harmful for Oklahoma to enact policies such as eliminating the state income tax to mimic Texas. Oklahoma may be unwilling or unable to raise tax revenues from other sources as has Texas (e.g., Texas has significantly higher property taxes), which may harm needed investments in education and highways and bridges. For example, I also find evidence in this study indicating the importance of college graduates for economic growth.

2. A BRIEF RECAP OF THE RECENT LITERATURE

The academic literature on the relationship between state and local fiscal policies and economic growth is inconclusive, often producing contradictory findings (Wasylenko, 1997). In an early survey of the literature, Bartik (1991) reports a general finding of a modest negative relationship between most state and local taxes and regional growth. In his review, Fisher (1997) reported positive growth effects for some regional government expenditures, particularly those for highway transportation. Thus, a possible reason for the lack of a strong connection between taxes and growth is that lower taxes also imply lower expenditures, which may be positively related to economic activity. To be sure, in a meta-analysis of the studies reviewed by Bartik, Goss (1995) observes that studies which fail to include variables for state and local government services find smaller negative regional tax effects. In such a study, Helms (1985) found that taxes used to finance public transfer payments such as welfare expenditures, the omitted category, reduced growth while those used to finance state and local education and highways (variables included in the regressions) did not.

More recently, Brown et al. (2003) found that while some state and local expenditures more than offset the negative effect of taxes, most did not. Subsequently, Taylor and Brown (2006) found that the net effect of the size of state and local government changed over time, having negative effects on private sector growth during the 1980s, but likely on balance maximizing private sector growth in the 1990s. Likewise, Deskins and Hill (2010) found evidence that the negative effects of taxes on state economies diminished from 1985 to 2003, as the variation in the size of state and local governments diminished.

In an extensive empirical analysis, Reed (2008a) estimated the relationship between taxes and personal income growth for 1970 to 1999 for the lower 48 U.S. states. He reports that taxes used to fund general expenditures significantly reduce personal income growth. The relationship is shown to be robust to specifications of government finances, and was consistent across space and time. Reed attributes a primary difference for his results and the lack of consistency found in earlier studies to his use of five-year changes, which capture lagged responses to taxes. In a

follow-up study, using extreme bounds analysis of Edward Leamer (1985), Reed (2008b) confirms the negative relationship between taxes and state economic growth across a wide range of specifications, though the effect is modest. However, the study did not address the potential endogeneity of taxes. As Reed acknowledges, if taxes are raised during periods of slow growth and lowered during periods of fast growth, ordinary least squares produces negatively-biased estimates.

Using spatial hedonic analysis of wages and housing costs and instrumental variables estimation to address potential endogeneity, Yu and Rickman (forthcoming) found state income taxes as having negative household amenity effects during the 1990s (as well as for most other state taxes), but also found positive amenity effects for state highway spending, and state spending on the environment and housing. For counties, local spending on education and safety increased firm profitability, while county spending on highways increased household amenity attractiveness of the county. County property taxes were found to reduce area household amenity attractiveness, but this effect was outweighed by the positive effect for public safety.

Holcombe and Lacombe (2004) examined counties that lie along state borders for 1960 to 1990. They argue that examination of border counties holds constant the influence of culture, weather, and access to markets. Border counties also were matched to those that were adjacent. Thus, identification of the policy effects derives from the extent adjacent county characteristics unrelated to state policies are similar. They found that counties located in states with higher personal income taxes experienced significantly slower per capita income growth over the period.

In an analysis of 2000-2007, Goetz et al. (2011) did not find the top marginal personal income tax rate, the top corporate income tax rate, or the effective property tax rate as statistically associated with state employment growth. Being a right-to-work state and having a greater variety of financial assistance programs were negatively related to employment growth, while having a greater variety of tax incentive programs and a more lax regulatory environment were statistically insignificant. The authors surmised that the lack of influence of taxes related to

their association with expenditures on productive and valued public services such as education and highways, which offset any beneficial effects of lower taxes. They instead find the natural amenity attractiveness of the state as the most significant factor, while evidence also was found for employment in technology-related occupations and computer usage as positively benefitting state economies.

Alm and Rogers (2011) use annual state and local data from 1947 to 1997 for 48 contiguous states to examine the relation between per capita income convergence/growth and an array of state and local fiscal and political climate variables. Across a variety of specifications and alternative estimation approaches, they report inconsistent findings for state and local taxation policies overall, in which the variables ranged from having negative, positive, or no effects at all. A state income tax variable was never found to have significantly negative effects, but was sometimes significantly positive. Interestingly, they report that a more ‘‘conservative political orientation” was negatively correlated with per capita income growth. Having tax and expenditure limitations (TELs) also was found to reduce state per capita income growth, a finding similarly reported by Deller et al. (2012).

Using a similar framework, Bauer et al. (2012) examine per capita income growth during the period of 1934 to 2004. They report that state strategies to alter tax policies to spur income growth were not effective. A patents variable mattered most for per capita income growth, followed by college attainment among the adult population and climate. Thus, the authors conclude that policy makers should focus on boosting the production of new technology and increasing college attainment.

3. METHODOLOGY

The review above suggests that the issue of the growth effects of state and local fiscal policies is far from settled. Studies continue to vary in their focus and methodology, making it difficult to draw general conclusions. This suggests that further analysis is warranted that specifically focuses on Oklahoma.

As a single economic indicator may not be representative of overall economic well-being (Partridge and Rickman, 1999; 2003), I examine growth for a number of indicators: total employment, manufacturing employment, population, real per capita income and real private gross domestic product. Because of the difficulty in controlling for all relevant growth determinants across space, potential spatial heterogeneities in regional growth dynamics (Partridge et al., 2008b) and non-constancy of fiscal policy effects across time (Brown and Taylor, 2006; Deskins and Hill, 2010), I solely compare the recent economic performance of Oklahoma with its neighbors for various recent periods of time. Given its prominence in the recent debates on lowering and repealing state income taxes, specific attention is given to Texas. To address the issue of lagged effects between policy changes and economic outcomes (Reed, 2008a), multi-year changes in economic outcomes are examined, including the periods 1990 to 2000 and 2000 to 2010. All data for these variables are from the U.S. Bureau of Economic Analysis.

Yet, because the neighboring states are geographically large and diverse, I then compare counties in Oklahoma with those in the neighboring states, including separately examining those along Oklahoma's border. In further analysis, I compare only Oklahoma-Texas border counties, including separating the counties in the states' panhandles from other counties along the border.[1] County level analysis provides the necessary degrees of freedom to statistically control for factors that may underlie state differences in growth. Exogenous factors that have been found to underlie regional growth differences include natural amenity attractiveness, the position along the rural-urban continuum and industry composition and industry composition (e.g., Partridge et al., 2012b). Natural amenity attractiveness is measured by a ranking produced by the USDA Economic Research Service, which is based on multiple indicators of climate, topographical

[1] Border counties have a long history of use for examining state policy differences. Besides the Holcome and Lacombe (2004) study on state personal income taxes, other border studies have examined the effects of state right-to-work laws (Holmes, 1998), state minimum wage laws (Thompson, 2008; Dube et al., 2010), state investment tax incentives (Chirinko and Wilson, 2008), sales taxes (Burnes et al., 2011), bank branching deregulation (Huang, 2008), environmental regulations (Kahn, 2004) and economic development incentives (Patrick, 2011).

variation, and water coverage (McGranahan, 1999). Also included are whether the county is classified as a recreation-based county by the USDA Economic Research Service and the percent of the county covered by forests (McGranahan et al., 2011).

Dummy variables are created using the 2003 USDA Economic Research Service's nine category rural-urban continuum codes regarding whether a county is: 1) in a metropolitan area with population of 1 million or more; 2) in a metropolitan area of 250,000 to 1 million people; 3) in a metropolitan area of fewer than 250,000 people; 4) a nonmetropolitan county with urban population of 20,000 or more, adjacent to a metropolitan area; 5) a nonmetropolitan county with urban population of 20,000 or more, not adjacent to a metropolitan area; 6) a nonmetropolitan county with urban population of 2,500-19,999, adjacent to a metropolitan area; 7) a nonmetropolitan county with urban population of 2,500-19,999, not adjacent to a metropolitan area; 8) a nonmetropolitan county completely rural or less than 2,500 urban population, adjacent to metropolitan area; or 9) a nonmetropolitan county completely rural or less than 2,500 urban population, not adjacent to metropolitan area.

These exogenous factors are included in both the analysis of all counties in the neighboring states and of those along the border. Because of limited degrees of freedom, they are omitted when only the counties along the Oklahoma and Texas border are considered. Yet, the restriction of the analysis to counties along a common border between two states implicitly controls for many of these and other growth influences, especially when they are matched by region of the common border.

Industry composition also is represented by a series of binary variables based on classification by USDA Economic Research Service. Counties are designated as primarily dependent on farming, government, manufacturing, mining, and services, with diversified counties as the omitted category. Classification is based on 1998-2000 county industry shares of labor and proprietor earnings (and employment for farming).

4. EMPIRICAL RESULTS

4.1 State Level Comparison

Table 1 displays state growth rates in total employment, manufacturing employment, population, real per capita income and real private gross domestic product (GDP) per employee (a measure of labor productivity) for Oklahoma and its neighboring states for the periods 1990-2000 and 2000-2010. To isolate the effects of the Great Recession, the latter period also is split into 2000-2007 and 2007-2010. Fastest growth among the states in each period is denoted by a superscripted asterisk.

Except real private GDP per employee, Colorado experienced the fastest growth according to all economic indicators during the 1990s. Among the seven states, Oklahoma had the fifth fastest rates of total employment and population growth, fourth fastest rate of manufacturing growth, and was last in real per capita income growth and real private GDP per employee growth. Except manufacturing employment growth, the growth rates for the economic indicators of Texas exceeded those of Oklahoma.

Following the nation, containing two recessions, the most recent decade by comparison was one of slower employment growth and significant losses in manufacturing employment across all states. Among the seven states, Texas led the way in total employment and population growth. New Mexico had the fastest growth real per capita income and real private GDP per employee. Although substantial, Kansas had the smallest decline in manufacturing employment. Despite the slower population and employment growth relative to Texas, Oklahoma experienced relatively faster real per capita income and real private GDP per employee growth.

The slightly stronger growth in population relative to employment and the relatively weaker growth in real per capita income and real per employee private GDP in Texas suggest that the growth was supply driven, through some combination of immigration and internal migration (Partridge and Rickman, 1999). Oklahoma's stronger real per capita income growth and faster growth of private real GDP relative to employment suggest demand as primarily underlying Oklahoma's growth. This is likely attributable to strength in the energy sector during the decade.

Table 1. State Growth Rate Comparison

State/Period	1990-2000	2000-2010	2000-2007	2007-2010
Arkansas				
Total Emp.	24.06%	3.61%	5.97%	-2.22%
Mft Emp.	10.32%	-31.70%	-19.46%	-15.20%
Real PCPI	56.74%	45.32%	38.89%	4.63%
Population	13.66%	9.07%	6.35%	2.56%
Real GDP/Emp.	21.95%	17.32%	13.76%*	3.37%
Colorado				
Total Emp.	43.48%*	7.82%	9.76%	-1.76%
Mft. Emp.	20.94%*	-28.81%	-19.38%	-11.69%
Real PCPI	75.39%*	24.45%	25.71%	-1.00%
Population	30.82%*	16.66%	11.02%	5.08%
Real GDP/Emp.	34.69%	15.02%	9.03%	5.31%
Kansas				
Total Emp.	19.27%	2.69%	4.90%	-2.11%
Mft. Emp.	13.72%	-18.18%*	-5.34%*	-13.56%
Real PCPI	57.86%	36.92%	32.30%	3.49%
Population	8.56%	6.14%	3.35%	2.71%
Real GDP/Emp.	15.53%	15.38%	13.44%	1.99%
Missouri				
Total Emp.	16.77%	0.56%	4.94%	-4.18%
Mft. Emp.	-5.50%	-31.28%	-16.25%	-17.95%
Real PCPI	58.60%	31.97%	27.38%	3.60%
Population	9.33%	6.93%	5.00%	1.84%
Real GDP/Emp.	23.21%	6.86%	3.03%	3.68%
New Mexico				
Total Emp.	26.70%	10.34%	14.09%	-3.28%
Mft. Emp.	12.33%	-23.99%	-9.00%	-16.47%
Real PCPI	53.45%	46.58%*	39.26%	5.26%*
Population	19.69%	13.44%	9.27%	3.81%
Real GDP/Emp.	67.47%*	17.55%*	6.21%	9.48%*
Oklahoma				
Total Emp.	21.03%	6.61%	7.05%	-0.41%
Mft. Emp.	11.70%	-25.06%	-11.47%	-15.34%
Real PCPI	53.03%	43.85%	39.54%*	3.09%
Population	9.70%	8.85%	5.21%	3.46%
Real GDP/Emp.	9.89%	16.34%	12.57%	3.31%
Texas				
Total Emp.	31.47%	17.56%*	15.41%*	1.86%*
Mft. Emp.	11.24%	-20.72%	-10.41%	-11.51%*
Real PCPI	65.12%	32.64%	33.64%	-0.74%
Population	22.79%	20.57%*	13.79%*	5.96%*
Real GDP/Emp.	25.96%	10.06%	8.31%	1.32%

*denotes fastest growth during the period

In separating out the effects of the recession, the primary difference for the 2000 to 2007 period relative to the entire decade is that Oklahoma experienced the strongest growth in real per capita income. Texas fared the best in terms of employment and population growth post-2007 but it also was one of only two states to experience a reduction in its real per capita income. Oklahoma exceeded Texas in each sub-period of the recent decade in the rate of per capita income growth and private real GDP per employee.

Arkansas, Kansas, and Texas were right-to-work states during the 1990s, while Oklahoma joined them early in the following decade. Texas was the only state without a state income tax. Oklahoma had the largest personal income taxes as a share of personal income in 1992 (2.2 percent), followed fairly closely by Arkansas (2.17 percent). By 2007, Kansas had the largest effective personal income tax rate, followed closely by Arkansas, and then Oklahoma.[2]

The negative correlations between 1990s growth and the effective personal income tax rate in 1992 ranged from -0.14 for employment growth to -0.35 for population growth for the seven states in the comparison. The value is approximately zero for manufacturing employment growth and positive for private productivity growth (r=0.26). When Texas is removed the negative correlation coefficients become positive or approximately zero, while productivity growth becomes more positively correlated with the 1992 state personal income tax rate. The correlations are much more negative for growth during 2000-2010 and the effective personal income tax rate in 2000, except for positive correlations for real per capita income and productivity growth.

The patterns of state growth appear to fit the common perception in the literature that the Texas economy has done well in comparison to other states. This appears to be particularly true for employment and population growth, but not as much for per capita income and per employee private GDP growth. The diversity between and within states along several dimensions makes it difficult to draw definitive conclusions regarding state policies from a simple comparison of state

[2] State tax rates for various years can be found at http://www.usgovernmentspending.com, last accessed May 25, 2013.

growth rates. Colorado ranks much higher in terms of amenity attractiveness. Given their location along the southern U.S. border, Texas and New Mexico may experience significantly greater immigration and benefits from U.S. trade with Mexico. Colorado, Oklahoma and Texas contain significant energy resources. The states also differ in their degree of urbanization. Therefore, I next perform an analysis of the counties in the states, while attempting to control for the aforementioned differences.

4.2 Analysis of all Counties in Oklahoma and Neighboring States

Tables 2 and 3 display the results of regression analysis of county growth rates for Oklahoma and those of neighboring states for the periods of 1990-2000 and 2000-2010, respectively. Results are not included for real private GDP because of the absence of county level data. The maximum number of counties available for analysis in the states is 722, where because of the absence of data for some counties, the number of counties used in each regression is less.

As shown in Table 2, all regressions for the 1990s are statistically significant. Significant variables in each regression are emboldened. The population regression has the largest r-squared, while the lowest is for manufacturing employment. Because of multicollinearity, the state binary variables can be significant even while the most or all individual coefficients are insignificant. To be sure, as seen from the reported F-statistics, the state binary variables are significant as a group in each regression. With Oklahoma the omitted category, this indicates that the remaining states as a group significantly differ from Oklahoma in each regression.

For 1990 to 2000, following the general findings of the literature (e.g., Deller, 2001; Rickman and Rickman, 2011) natural amenity attractiveness of the county significantly and positively influenced total employment growth. The negative and significant effect shown for the amenity ranking on manufacturing employment has been reported elsewhere (Henderson and McDaniel, 2005), which can occur if amenity attractiveness increases manufacturing costs, while not boosting demand which is national and international in scope. Status as a recreation county and forest cover positively and significantly influenced employment and population growth.

Counties further down in the urban/rural hierarchy (i.e., smaller and more remote) experienced increasingly slower (or more negative) total employment and population growth. Nonmetropolitan counties experienced about the same lower relative per capita income growth across categories. The only significant effect for immigration is the negative effect on per capita income growth. Energy counties experienced significantly slower growth in total employment and population over the decade. Counties specialized in services appear to have fared the best relative to non-specialized counties (the omitted category).

Table 2. All County Comparison: 1990-2000 (p-values in parentheses)

	Total Emp.	Mft. Emp	PCPI	Population
Constant	**0.32 (0.00)**	**0.70 (0.00)**	**0.64 (0.00)**	**0.18 (0.00)**
Amenity Rank	**0.04 (0.06)**	**-0.10 (0.02)**	-0.01 (0.48)	0.01 (0.16)
Recreation Cty	**0.17 (0.00)**	**0.29 (0.01)**	0.04 (0.13)	**0.11 (0.00)**
Forest Cover*100	**0.25 (0.00)**	-0.12 (0.13)	**0.11 (0.00)**	**0.13 (0.00)**
Immigration-1990s	-0.01 (0.80)	-0.05 (0.25)	**-0.02 (0.09)**	0.00 (0.93)
Texas Binary	-0.01 (0.73)	**0.18 (0.05)**	0.03 (0.13)	**0.06 (0.00)**
Kansas Binary	0.01 (0.78)	0.04 (0.60)	0.00 (0.95)	0.01 (0.79)
Arkansas Binary	-0.08 (0.19)	-0.09 (0.19)	**0.05 (0.10)**	0.00 (0.88)
Missouri Binary	-0.04 (0.46)	-0.09 (0.19)	**0.10 (0.00)**	0.01 (0.50)
Colorado Binary	**0.18 (0.00)**	**0.24 (0.02)**	**0.09 (0.01)**	**0.17 (0.00)**
New Mex. Binary	0.02 (0.77)	0.12 (0.43)	**0.06 (0.07)**	**0.11 (0.00)**
Farm Cty	-0.03 (0.49)	-0.03 (0.73)	**-0.09 (0.00)**	**-0.06 (0.00)**
Energy Cty	**-0.11 (0.03)**	-0.14 (0.16)	0.02 (0.36)	**-0.11 (0.00)**
Manufacturing Cty	-0.02 (0.55)	0.01 (0.92)	**-0.03 (0.08)**	-0.02 (0.11)
Government Cty	-0.00 (0.93)	-0.11 (0.17)	**-0.05 (0.01)**	-0.01 (0.60)
Services Cty	**0.17 (0.00)**	-0.01 (0.86)	0.02 (0.40)	**0.08 (0.00)**
RuralUrban=2	**-0.17 (0.00)**	-0.12 (0.19)	**-0.07 (0.01)**	**-0.06 (0.02)**
RuralUrban=3	**-0.29 (0.00)**	**-0.20 (0.02)**	**-0.09 (0.00)**	**-0.16 (0.00)**
RuralUrban=4	**-0.30 (0.00)**	**-0.18 (0.09)**	**-0.13 (0.00)**	**-0.16 (0.00)**
RuralUrban=5	**-0.33 (0.00)**	-0.15 (0.13)	**-0.13 (0.00)**	**-0.18 (0.00)**
RuralUrban=6	**-0.33 (0.00)**	**-0.24 (0.00)**	**-0.13 (0.00)**	**-0.20 (0.00)**
RuralUrban=7	**-0.36 (0.00)**	-0.06 (0.61)	**-0.13 (0.00)**	**-0.22(0.00)**
RuralUrban=8	**-0.32 (0.00)**	**-0.21 (0.08)**	**-0.14 (0.00)**	**-0.18 (0.00)**
RuralUrban=9	**-0.43 (0.00)**	**-0.18 (0.08)**	**-0.14 (0.00)**	**-0.25 (0.00)**
F-stat (States)	3.02[a]	3.16[a]	4.87[a]	7.57[a]
F-state (Regression)	14.33[a]	2.12 [a]	10.55[a]	31.12[a]
R-squared	0.32	0.08	0.26	0.51
# of observations	719	600	719	719

[a]denotes significant at or below the 0.10 level

In terms of the remaining state differences, despite controlling for natural amenity attractiveness, Colorado generally grew faster than the other states. Texas had significantly faster growth in manufacturing employment and population than Oklahoma, but not in total employment or per capita income.[3] Only Colorado had significantly stronger employment growth than Oklahoma, while it was joined by Arkansas, Missouri and New Mexico in terms of per capita income growth. Only Texas had both a right-to-work law and an absence of a personal income tax. Arkansas had a right-to-work law but an effective income tax close to Oklahoma's, while New Mexico was not a right-to-work state and had a nearly as large effective personal income tax rate. Thus, the differences are not clearly attributable to state personal income taxation, or right-to-work status.

Turning to the 2000 to 2010 period, from Table 3 it can be seen that again all regressions are statistically significant. The pattern of r-squares is the same as for the previous decade. Again, the state binary variables are significant as a group in each regression.

Natural amenity attractiveness continued to be related to total employment growth, as was status as a recreation county, and also now positively influenced manufacturing employment growth. Forest cover positively influenced population growth but negatively affected per capita income growth and manufacturing employment growth. Immigration became significantly and positively related to growth in population, while also negatively influencing per capita income growth. Counties specialized in the energy sector had faster total and manufacturing employment growth, in addition to faster per capita income growth. Following the national trend, manufacturing counties performed poorly over the decade. Growth was stronger in the largest urban areas for total employment and population growth, though there were no longer increasingly negative growth penalties for counties further down the urban/rural hierarchy.

[3] Except for total employment growth, when added, status as a retirement county was positively and significant in all regressions. This causes the Texas coefficient to become insignificant for manufacturing employment growth and to become nearly insignificant for population growth (suggesting the Texas population growth differential is largely retirement migration). However, the variable is omitted from the final specifications because policy differences may in part underlie retirement destination status across states.

In terms of state differences, Colorado no longer led the way in growth. Texas experienced significantly stronger employment growth than Oklahoma once other influences were controlled for such as immigration and energy dependence of the county. Yet, in analysis not shown, running the regressions separately for 2000-2007 and 2007-2010, revealed that the significantly stronger growth in Texas only occurred during the 2007-2010 period, in which during 2000-2007 Oklahoma and Texas were not statistically distinguishable. If the growth differences derived

Table 3. All County Comparison: 2000-2010 (p-values in parentheses)

	Total Emp.	Mft. Emp	PCPI	Population
Constant	**0.14 (0.00)**	**-0.33 (0.01)**	**0.46 (0.00)**	**0.16 (0.00)**
Amenity Rank	**0.01 (0.07)**	**0.05 (0.08)**	-0.00 (0.82)	0.01 (0.31)
Recreation Cty	**0.04 (0.04)**	0.07 (0.40)	-0.00 (0.96)	0.02 (0.30)
Forest Cover*100	-0.01 (0.64)	**-0.27 (0.00)**	**-0.08 (0.01)**	**0.05 (0.00)**
Immigration-1990s	0.40 (0.15)	-0.83 (0.44)	**-1.99 (0.00)**	**1.20 (0.00)**
Texas Binary	**0.05 (0.00)**	0.08 (0.20)	0.04 (0.11)	0.01 (0.39)
Kansas Binary	**-0.06 (0.01)**	0.11 (0.11)	-0.02 (0.42)	**-0.05 (0.00)**
Arkansas Binary	**-0.06 (0.01)**	-0.10 (0.16)	-0.01 (0.68)	**-0.04 (0.04)**
Missouri Binary	**-0.07 (0.00)**	-0.06 (0.33)	**-0.12 (0.00)**	-0.01 (0.67)
Colorado Binary	-0.03 (0.27)	0.04 (0.68)	**-0.07 (0.04)**	-0.02 (0.30)
New Mex. Binary	0.02 (0.48)	0.01 (0.94)	**0.07 (0.07)**	-0.03 (0.24)
Farm Cty	**-0.03 (0.09)**	0.11 (0.17)	-0.02 (0.41)	**-0.05 (0.00)**
Energy Cty	**0.07 (0.08)**	**0.25 (0.03)**	**0.08 (0.00)**	-0.01 (0.67)
Manufacturing Cty	**-0.05 (0.00)**	**-0.06 (0.06)**	**-0.03 (0.09)**	-0.02 (0.11)
Government Cty	0.01 (0.46)	-0.01 (0.87)	**0.04 (0.10)**	-0.01 (0.37)
Services Cty	0.03 (0.21)	**-0.11 (0.06)**	-0.04 (0.12)	**0.04 (0.00)**
RuralUrban=2	**-0.05 (0.02)**	-0.03 (0.60)	**0.08 (0.01)**	**-0.06 (0.00)**
RuralUrban=3	**-0.13 (0.00)**	0.06 (0.41)	**0.07 (0.01)**	**-0.12 (0.00)**
RuralUrban=4	**-0.14 (0.00)**	-0.07 (0.29)	**0.09 (0.01)**	**-0.15 (0.00)**
RuralUrban=5	**-0.10 (0.00)**	0.04 (0.69)	**0.14 (0.00)**	**-0.12 (0.00)**
RuralUrban=6	**-0.16 (0.00)**	0.01 (0.84)	**0.13 (0.00)**	**-0.17 (0.00)**
RuralUrban=7	**-0.18 (0.00)**	-0.03 (0.63)	**0.13 (0.00)**	**-0.17 (0.00)**
RuralUrban=8	**-0.15 (0.00)**	-0.07 (0.51)	**0.15 (0.00)**	**-0.18 (0.00)**
RuralUrban=9	**-0.12 (0.00)**	-0.02 (0.81)	**0.18 (0.00)**	**-0.19 (0.00)**
F-stat (States)	12.10[a]	4.13[a]	10.94[a]	5.66[a]
F-state (Regression)	16.09[a]	4.57[a]	10.81[a]	25.02[a]
R-squared	0.35	0.16	0.26	0.45
# of observations	718	564	718	718

[a]denotes significant at or below the 0.10 level

from policy differences, it would be expected to also have been evident during the 2000-2007 period. For example, national defense spending on goods and service surged during the 2007-2010 period, in which Texas has been reported to be the third most economically sensitive state to U.S. military buildups (Nakamura and Steinsson, 2011). Texas also has been estimated to have had a significantly greater percentage increase in employment from the American Recovery and Reinvestment Act of 2009 than Oklahoma (Zandi, 2009). The other state faring well was New Mexico, possessing the strongest growth in per capita income, but like Texas this only occurred during the 2007-2010 period. Arkansas and Kansas fared poorly in terms of total employment and population growth, a result which also held true during the 2000-2007 period.

In further results not shown, adding educational attainment among adults 25 years and older reveals significant positive economic effects for college education. The share of the adult population with a bachelor's degree or more in 2000 significantly increased employment, per capita income and population growth over the 2000-2010 period. Universities and college graduates spur growth both by increasing productivity and by increasing the quality of life in an area (Winters, 2011a; 2011b). The shares with only a high school degree or an associate degree were insignificant. Beginning of period values were used to avoid direct endogeneity. Yet, the variables were not included in the final specification because of their potential relation to state spending on education, whereby, the state variables are used to capture the net effects of all policy differences.

3.3 Analysis of Border Counties

Because there may be important unaccounted for differences between the states, I next examine the counties that are positioned along the Oklahoma border. For example, numerous counties in Texas are on the Gulf Coast, while both New Mexico and Texas share an international border. While the international border influence on immigration should mostly be accounted for by the immigration variable included in the regression, there may be unaccounted for international trade effects. Use of border counties greatly reduces the number of counties

examined, but it more effectively identifies state differences in growth as attributable to policy differences. Only one Colorado county and one New Mexico county borders Oklahoma. Table 4 displays results from estimation of two alternative models for each variable and period. The base model only includes the binary variables for the states, omitting that for Oklahoma. Thus, each binary variable is interpreted as the growth differential from Oklahoma for the variable and period. The full model then includes the variables used in the analysis of all counties above. For brevity, the results for these control variables are not shown, but generally follow the patterns for all counties displayed in Tables 2 and 3.

As shown in the bottom rows of Table 4, the population regressions have the largest r-squares and were the only consistently statistically significant regressions. Other significant regressions include the full model for total employment growth during the 1990s and both models of real per capita growth post-2000. There are few statistically significant state differences.

Although most coefficients for Texas, other than for per capita income, are positive, only the coefficient for manufacturing employment growth in the full model is statistically significant. The positive coefficients are statistically insignificant, even where quantitatively significant, because the differences in growth were not consistently positive for most Texas border counties, exhibiting large variation. Missouri experienced significantly greater population growth during the 1990s according to both models. Arkansas's significant coefficients in the base model become insignificant in the full model when I control for differences in amenity attractiveness, position in the rural-urban continuum and industry structure. The significant differences for Colorado and New Mexico pertain to a single county in each of the states.

Finally, to more specifically address the comparison of Oklahoma to Texas, additional regressions are run for each variable and period using only the counties along the Oklahoma-Texas border. Because there are only thirty six such counties (sixteen for Oklahoma and twenty for Texas), I only estimate the base model. In addition, separate base model regressions are run for the border counties in the panhandles of the two states. These regressions best capture the

Table 4: Border County Comparison

State/Period	1990-2000-base	1990-2000-full	2000-2010-base	2000-2010-full
Texas				
Total Emp.	-0.00 (0.94)	0.02 (0.70)	0.00 (0.92)	0.06 (0.22)
Mft Emp.	0.17 (0.40)	0.23 (0.45)	0.18 (0.23)	**0.35 (0.09)**
PCPI	-0.00 (0.96)	0.01 (0.75)	-0.07 (0.13)	-0.06 (0.24)
Population	0.02 (0.48)	0.02 (0.58)	0.01 (0.68)	0.03 (0.22)
Kansas				
Total Emp.	-0.07 (0.24)	0.02 (0.78)	-0.06 (0.21)	-0.03 (0.64)
Mft. Emp.	-0.12 (0.63)	-0.10 (0.67)	0.20 (0.24)	0.24 (0.27)
PCPI	0.01 (0.85)	0.02 (0.45)	-0.00 (0.93)	-0.02 (0.71)
Population	-0.03 (0.43)	0.01 (0.77)	**-0.05 (0.08)**	-0.02 (0.42)
Arkansas				
Total Emp.	**0.16 (0.03)**	0.08 (0.42)	-0.03 (0.66)	-0.02 (0.77)
Mft. Emp.	-0.03 (0.92)	0.36 (0.35)	-0.05 (0.81)	0.01 (0.97)
PCPI	0.06 (0.33)	-0.01 (0.79)	**-0.15 (0.02)**	-0.04 (0.65)
Population	**0.19 (0.00)**	0.08 (0.18)	**0.13 (0.00)**	0.06 (0.20)
Missouri				
Total Emp.	0.13 (0.31)	0.21 (0.15)	0.01 (0.92)	0.12 (0.36)
Mft. Emp.	-0.13 (0.78)	0.14 (0.76)	0.09 (0.77)	0.59 (0.17)
PCPI	0.18 (0.11)	0.07 (0.33)	-0.11 (0.37)	-0.09 (0.50)
Population	**0.20 (0.03)**	**0.21 (0.02)**	0.08 (0.24)	0.06 (0.39)
Colorado				
Total Emp.	0.01 (0.95)	0.10 (0.53)	-0.10 (0.51)	-0.13 (0.39)
Mft. Emp.	NA	NA	NA	NA
PCPI	-0.10 (0.52)	-0.01 (0.91)	0.16 (0.34)	0.18 (0.26)
Population	-0.04 (0.78)	0.05 (0.62)	**-0.16 (0.08)**	-0.13 (0.12)
New Mexico				
Total Emp.	-0.02 (0.89)	0.07 (0.68)	-0.09 (0.57)	-0.11 (0.45)
Mft. Emp.	NA	NA	NA	NA
PCPI	0.14 (0.38)	0.10 (0.23)	**-0.57 (0.00)**	**-0.53 (0.00)**
Population	-0.01 (0.93)	0.07 (0.49)	0.08 (0.40)	0.10 (0.20)
Regression r-squares				
Total Emp.	0.12 (N=76)	0.50[a] (N=76)	0.04 (N=76)	0.34 (N=76)
Mft. Emp.	0.03 (N=57)	0.24 (N=57)	0.06 (N=53)	0.35 (N=53)
PCPI	0.06 (N=76)	0.23 (N=76)	0.21[a] (N=76)	0.49[a] (N=76)
Population	0.25[a] (N=76)	0.68[a] (N=76)	0.27[a] (N=76)	0.59[a] (N=76)

[a]denotes significant at or below the 0.10 level

matching approach of Holcombe and Lacombe (2004), in which it is argued that the closest (or adjacent) counties provide the best comparison for policy identification purposes. There are sixteen Oklahoma and Texas counties along the border in the panhandle, with twenty others along the remaining (Red River) part of the Oklahoma-Texas border.

From Table 5, it can be seen that the only significant difference is the significantly lower growth of per capita income during 2000-2010, specifically in the Texas panhandle counties. Although these counties had stronger employment and population growth, these differences were not statistically significant. This fits a pattern noted above for the state of Texas, one of supply induced growth, which was confirmed when international immigration was included in the full models. According to Census intercensal estimates, all Texas panhandle counties experienced positive immigration but negative net internal migration. Most of the other differences are not only statistically insignificant but also quantitatively small.

4. DISCUSSION AND CONCLUSIONS

This paper addresses the issue of whether Texas should serve as an economic policy model for Oklahoma and other nearby states. Advocates point to the generally stronger employment and population growth of Texas (Wall Street Journal, 2012b). Critics point to the lower per capita income growth and higher unemployment and poverty in Texas (Semuels, 2011;

Table 5. Oklahoma-Texas Border County Comparison

	1990-2000	**2000-2010**
Total Employment		
Texas Effect	-0.01 (0.84)	0.01 (0.86)
Panhandle	-0.09 (0.48)	0.08 (0.30)
Red River	0.05 (0.51)	-0.05 (0.53)
Mft Employment		
Texas Effect	0.14 (0.69)	0.21 (0.41)
Panhandle	0.36 (0.79)	0.35 (0.72)
Red-River	-0.06 (0.86)	-0.02 (0.91)
Per Capita Personal Income		
Texas Effect	-0.01 (0.89)	**-0.13 (0.04)**
Panhandle	-0.06 (0.61)	**-0.20 (0.04)**
Red River	0.04 (0.39)	-0.07 (0.35)
Population		
Texas Effect	0.04 (0.27)	0.02 (0.56)
Panhandle	0.04 (0.54)	0.05 (0.28)
Red River	0.05 (0.31)	-0.01 (0.81)

Flentje, 2012). Questions also have been raised regarding whether Texas's experience relates to its economic policies or other unique features of the state (McNichol and Johnson, 2012).

Therefore, this paper compared the recent economic performance of Oklahoma to that of its neighboring states, with particular focus on Texas. Two broad methodological issues were addressed. The first issue was correctly interpreting the various indicators of state economic performance. The second was properly comparing the states' economic experiences to infer lessons for economic policy.

A comparison of the state averages revealed generally stronger employment and population growth for Texas relative to Oklahoma, though Colorado had the strongest growth in the 1990s among all adjacent states. Texas also had relatively weaker growth in per capita income and real private GDP per employee growth relative to population growth, suggesting that growth in Texas was primarily supply driven, through some combination of immigration and internal migration (Partridge and Rickman, 1999). Yet, because of other differences between the states not related to policy, definitive lessons for policy could not be drawn from the comparison.

I next compared county-level growth for Oklahoma and neighboring states. An advantage of using county level data is that variables could be added to control for differences in natural amenity attractiveness, the county's position in the rural-urban continuum, the industry dependency or specialization of the county and the rate of international immigration into the county. Residual (unexplained) differences in economic performance were captured by binary state variables.

During the 1990s, the binary variables revealed that Texas had significantly faster residual growth in manufacturing employment and population than Oklahoma, but not in total employment or real per capita income for which there were no statistical differences. Post-2000, Texas experienced significantly stronger employment growth than Oklahoma once other influences were controlled for such as immigration and energy dependence of the county. But

these differences only were only significant during the 2007-2010 period, a period where Texas particularly benefitted from increased federal spending.

Because other unaccounted for differences remained such as Texas's proximity to the Gulf coast, its border with Mexico and possible differences in culture, I next compared the counties that are positioned along the Oklahoma border. First, border counties of all neighboring states were included, in which a model only containing the state binary variables and then a model adding all previous control variables were estimated. The only statistically significant advantage for Texas was found for manufacturing employment growth during the 2000 to 2010 period.

To more directly compare Oklahoma and Texas, I next solely examined the counties along the Oklahoma-Texas border. Given that the counties should share most non-policy characteristics and because of the limited number of observations, the estimated regressions only included the state binary variables. I also separately compared the counties in the panhandles of the two states from the other border counties. This produced a quasi-matching comparison. The only statistically significant effect for Texas was the lower per capita income growth in Texas during 2000-2010, a result that appeared mostly to occur in the panhandle counties. Although not statistically significant, the Texas panhandle counties also experienced stronger manufacturing employment and population growth. Along with positive immigration, this suggests that growth in the counties occurred in low-paying manufacturing plants, possibly disproportionately employing immigrants.

In conclusion, there is not compelling evidence that Texas economically outperforms Oklahoma. Differences in growth at the state level appear mostly driven by labor supply, in which immigration is a significant contributing factor. Controlling for other differences between Oklahoma and Texas using county level data for all neighboring states revealed few growth advantages, in which the only advantage post-2000 occurred during 2007 to 2010. Notably, Texas did not enjoy any advantages during the 2000 to 2007 period, which is prior to when Oklahoma continued to reduce its personal income tax rate. Most telling is that in an analysis of all border counties, the only positive evidence found for Texas was stronger manufacturing

employment growth. In focusing solely on counties along the Oklahoma-Texas border, I found significantly slower per capita income growth in Texas, specifically in the panhandle counties. Given their initial lower levels of per capita income, slower real per capita income growth in these counties is not consistent with a convergence argument.

Texas was used as an example of why Oklahoma needed to enact a right-to-work law. The county-level evidence above suggests that Oklahoma did not experience improved economic outcomes relative to Texas after enacting right-to-work (RTW) legislation in 2001. In fact, in a recent study, using a synthetic control approach in an effort to create an experimental setting, Eren and Ozbeklik (2011) conclude that the RTW law in Oklahoma did not affect its manufacturing employment, per capita income or private sector average wages, though it did reduce union membership.

The evidence above suggests that eliminating the state income tax at best would have no impact. At worst, if Oklahoma's adjustment to elimination of the state income tax in terms of spending and alternative taxes is worse than that of Texas, the Oklahoma economy could be harmed. Vital investments in education and infrastructure could be harmed, which could more than offset any gains from reducing income taxes. Also, it is not clear that sales or property taxes are any more desirable than income taxes (Yu and Rickman, forthcoming). This does not mean that improvements could not be made such as eliminating ineffective and distortionary incentives and replacing them with lower tax rates, but this has proven to be difficult politically. Given the potential for adverse effects on the overall economy and on many of its citizens, the evidence presented in this paper suggests that Oklahoma should proceed cautiously when considering any changes in state taxation and spending as likely more harm than good will result.

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Appendix 1. Counties along the Oklahoma Border and FIPS Codes

Oklahoma	Adair	40001	**Texas**	Bowie	48037
	Alfalfa	40003		Childress	48075
	Beaver*	40007		Clay	48077
	Beckham*	40009		Collingsworth	48087
	Bryan*	40013		Cooke	48097
	Choctaw*	40023		Dallam	48111
	Cimarron*	40025		Fannin	48147
	Cotton*	40033		Grayson	48181
	Craig	40035		Hansford	48195
	Delaware	40041		Hardeman	48197
	Ellis*	40045		Hemphill	48211
	Grant	40053		Lamar	48277
	Harmon*	40057		Lipscomb	48295
	Harper	40059		Mantague	48337
	Jackson*	40065		Ochiltree	48357
	Jefferson*	40067		Red River	48387
	Kay	40071		Sherman	48421
	Le Flore	40079		Wheeler	48483
	Love*	40085		Wichita	48485
	Marshall*	40095		Wilbarger	48487
	McCurtain*	40089	**Kansas**	Barber	20007
	Nowata	40105		Chautauqua	20019
	Osage	40113		Cherokee	20021
	Ottawa	40115		Clark	20025
	Roger Mills*	40129		Comanche	20033
	Sequoyah	40135		Cowley	20035
	Texas*	40139		Harper	20077
	Tillman*	40141		Labette	20099
	Washington	40147		Meade	20119
	Woods	40151		Montgomery	20125
Arkansas	Benton	05007		Morton	20129
	Crawford	05033		Seward	20175
	Little River	05081		Stevens	20189
	Polk	05113		Sumner	20191
	Scott	05127	**Missouri**	McDonald	29119
	Sebastian	05131		Newton	29145
	Sevier	05133	**New Mexico**	Union	35059
	Washington	05143	**Colorado**	Baca	08009

*Indicates the Oklahoma County lies along the border with Texas