Assessing the Economic Impact of the Fayetteville, Arkansas Smoking Ban

Produced for the Northwest Arkansas Tobacco-Free Coalition

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Executive Summary

This report is the third in a series of studies examining the impact of the implementation of the smoke-free ordinance in Fayetteville, Arkansas in March of 2004. The ban on smoking in public places in Fayetteville provides an opportunity to scientifically investigate the economic impact of this change in public policy. By comparing pre-ban historical economic growth rates to post-ban growth rates both within the city of Fayetteville and in comparable communities, some measure of the impact can be developed. Variables of interest include hotel, motel, and restaurant (HMR) taxes, employment, and sales taxes. The changes in these variables need to be controlled for changes in other variables that affect economic activity like population growth and changes in gross domestic product.

The first edition of this report detailed the relevant set of historical economic data to the Fayetteville situation. In the second version of the project, the data have been updated to reflect economic activity in 2004. This report includes data on the economic activity of year 2005 as well as revised data for the previous years. Two years of information has become available since the implementation of the smoking ban, so some picture of the immediate effects on the local economy can begin to be seen.

The Northwest Arkansas region, including Fayetteville, continued to experience significant economic growth during 2005. Employment increased at healthy rates, along with sales and HMR taxes in all Washington and Benton County communities. Although only two years' worth of data is available, thus far there is no discernable difference between Fayetteville's economic growth path prior to and since the institution of the smoke free ordinance. In fact, for the year 2005, same-store sales at Fayetteville restaurants open at least a year increased almost 15 percent. This growth rate was almost double compared with the growth in 2004 (8.4 percent).

Three regression models were estimated to show the effect of the Fayetteville smoking ordinance on HMR and Supplemental Beverage tax collections. In none of the models did the imposition of the ordinance have any statistically significant effect. However, the results of the estimation still should be viewed with caution as they are based on relatively few data points. As more data become available in the coming years, more definitive answers about the nature of the economic impact of Fayetteville's smoke free ordinance can be made.

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Introduction

The city of Fayetteville, Arkansas holds a unique status in the state. As the home of Arkansas' premier research university, the city is full of groundbreaking ideas. On March 11, 2004, the city became the first municipality in the state of Arkansas to institute a ban on smoking in public places. The decision was made by Fayetteville voters in a referendum after an often contentious public debate. Broadly, there were two schools of thought about whether Fayetteville should ban smoking in public places. On one side was a coalition of organizations and individuals who argued that the known health risks associated with smoking and second-hand smoke made the ban on smoking imperative for the sake of public health. On the other side of the issue were a group of restaurant owners and individuals who maintained that because tobacco use is a legal activity, each private business should retain the right to decide whether an establishment would permit tobacco consumption.

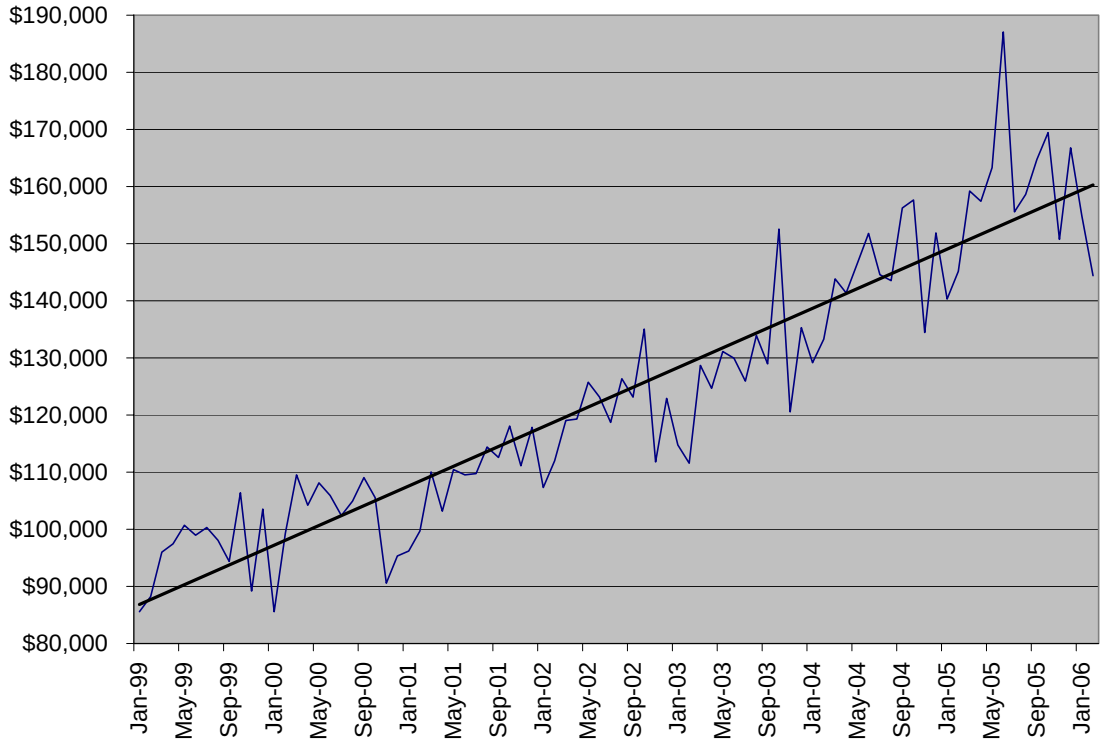
Ultimately, the voters in Fayetteville decided to make their public places smoke-free. This decision meant that restaurant and other business owners were not free to set smoking policies within their places of business, but rather had to abide by the limitations set forth in the statute. Whenever business decision makers are faced with a new constraint on their business practices, there will be some consequences as consumers change their buying habits to comply with the new public policy. The purpose of this study is to compare post-ordinance economic activity with a pre-smoking ban baseline data set.

Data Review

HMR Tax Collections

Economists use a wide variety of variables to measure economic activity. In the case of the Fayetteville smoking ban, emphasis has to be placed on the sales of food and beverages in restaurants. The best indicator that is available of those sales is the city's Hotel/Motel/Restaurant (HMR) tax collections. Researchers at the Center for Business and Economic Research (CBER) obtained a data set from city of Fayetteville staff detailing monthly HMR collections from January 1994 through February 2006, revising the data from the previous reports. From 1994 to 2005, Fayetteville HMR monthly collections more than doubled. Total annual collections for 1994 were $925,907. A decade later, in 2003, total annual collections were $1,538,023. This implies an annual average growth rate of 6.5 percent, although actual annual growth rates had more variability. Figure 1 details the trend of Fayetteville HMR collections over the period of 1999-2006. No seasonal adjustments were made to the data and a trend line was added. In 2004, with the implementation of the restrictions on smoking in public places in March, total annual collections were $1,734,301, which implies an annual growth rate of 7.9 percent for the period of 1994-2004. In 2005, Fayetteville HMR annual collections were $1,918,371, growing by 10.6 percent from 2004.

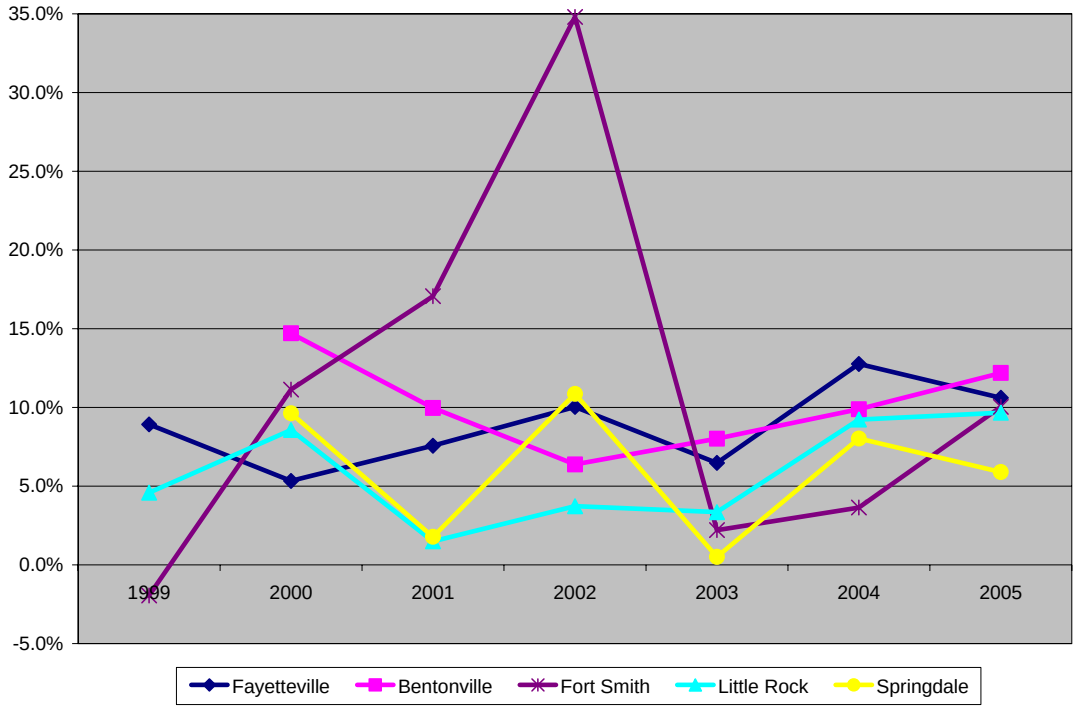
Figure 1: Monthly Fayetteville HMR Tax Collections
(January 1999 – February 2006, trendline added)



CBER researchers also collected HMR data or advertising and promotion (A&P) receipts from other communities in Arkansas for the sake of comparison. Data were collected from both Bentonville and Rogers in Benton County, from Springdale in Washington County, from Fort Smith in Sebastian County, and from Little Rock in Pulaski County. Figure 2 details the annual growth rates in HMR or A&P collections for these communities for the period of 1999-2005.

In Fayetteville, from 1999 to 2000, even as HMR receipts grew, the rate at which they increased declined. Little Rock followed the same trend in 2001. Fort Smith experienced a great deal of volatility in the growth rates of its A&P collections. In 2001 and 2002, Fayetteville, Springdale, Little Rock, and Fort Smith all experienced increases in the growth rate of collections. Among the comparison cities, Bentonville alone failed to realize the temporary bump in 2002. From 2003 to 2004, all of the cities examined showed positive growth rates. Except for Rogers (which is not shown on the graph due to exceedingly high growth rates in A&P collections that mask the changes in the other cities), Fayetteville had the highest growth rate in HMR receipts from 2003 to 2004. Year 2005 showed another cyclical decline in growth of tax collections in Fayetteville and Springdale. However, Fayetteville still had the growth rate higher than the growth rate in all other cities except Rogers and Bentonville.

Figure 2: Annual Growth Rates in HMR or A&P Receipts



Fayetteville collections generally follow similar paths as the other cities in the state, although the correlations are not perfect between or among any of the municipalities. Table 1 details the correlation coefficients among selected Arkansas city HMR or A&P tax receipts from 2000-2005. Of the selected cities, Fayetteville correlates with Fort Smith least closely. Fort Smith does not have a "hamburger tax," so the A&P collections are made from overnight stays only. Additionally, Rogers and Springdale do not collect special taxes on restaurant food purchases, but their A&P commissions collect revenues from hotel and motel stays only.

Table 1: HMR or A&P Tax Collections Correlation Matrix (2000-2005)

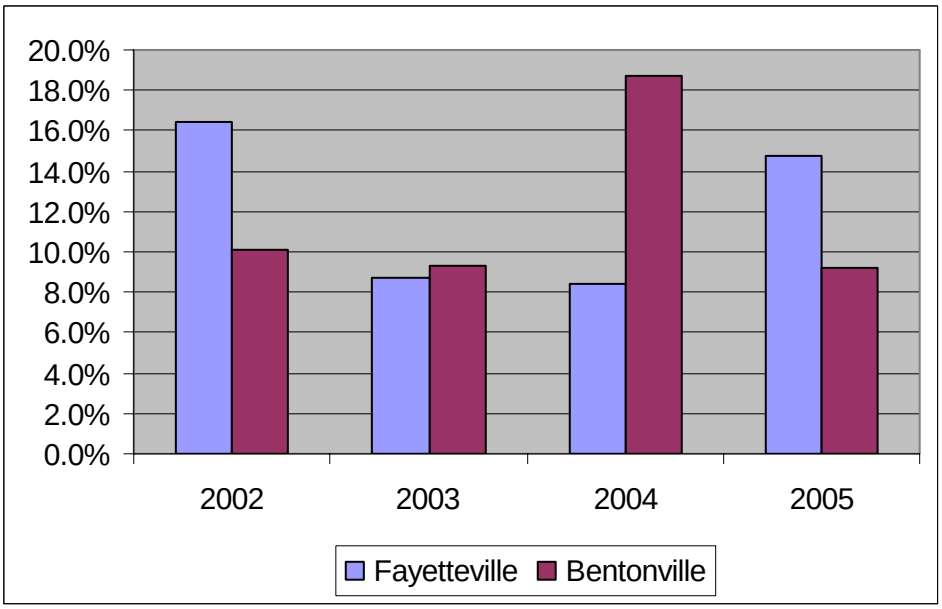
	Fayetteville	Bentonville	Fort Smith	Little Rock	Rogers	Springdale
Fayetteville	1.00					
Bentonville	0.99	1.00				
Fort Smith	0.92	0.91	1.00			
Little Rock	0.98	0.98	0.84	1.00		
Rogers	0.98	0.97	0.89	0.95	1.00	
Springdale	0.99	0.98	0.95	0.96	0.96	1.000

It can be argued that the tremendous growth rate in new restaurant establishments masks some of the effects of the current economic climate (including the smoking ban) on existing restaurants. Therefore, CBER researchers examined "same-store" HMR tax collections on restaurants. Year after year, restaurant collections were matched up and growth rates were calculated only for those that were open at least a year. If a restaurant went out of business during a year, the year-to-date revenues were included. This has the

effect of producing a very conservative lower bound for the growth rate in same-store HMR tax collections.

The only two cities in Northwest Arkansas that collect restaurant taxes are Fayetteville and Bentonville. Figure 3 compares the performance of same-store restaurant tax collections in the two cities for the period of 2002-2005 based on revised data. It demonstrates that the growth rate of HMR tax collections at restaurants in Fayetteville open at least a year declined in 2003 and 2004. However, in 2005, same-store sales' growth staged a clear recovery in Fayetteville. Bentonville restaurant taxes, on the other hand, experienced the highest growth rate in 2004, returning to its usual level of growth in 2005.

Figure 3: Same-Store Restaurant HMR Tax Collections Growth in Fayetteville and Bentonville



The aggregate effects of same-store restaurant tax collections in Fayetteville are presented in Table 2. In 2004, there were 259 restaurants that had been open since 2003. A total of 66.4 percent of these restaurants had higher sales than in 2003. In 2005, there were 261 restaurants in Fayetteville that were also open in 2004. Of these, 67.4 percent had higher HMR tax receipts in 2005 than in 2004. This is the highest proportion among the same-store restaurants during the period of 2001-2005. The number of restaurants open at least a year was also the highest in 2005, increasing from 181 in 2001 to 261.

Table 2: Fayetteville Same-Store Restaurant Statistics

	2001	***2002***	***2003***	***2004***	***2005***
Restaurants Open at Least a Year	181	226	243	259	261
Restaurants with Positive Growth in HMR Receipts	104	137	131	172	176
Percentage	57.5%	60.6%	53.9%	66.4%	67.4%

Fayetteville Economic Indicators

Fluctuations in HMR collections are dependent on a wide variety of economic variables. Table 3 presents the values for some Fayetteville variables that have potential to affect HMR collections. It is reasonable to believe that sales tax collections might move similarly to HMR tax collections, but a single glance at Table 3 indicates that Fayetteville sales taxes and HMR taxes are not correlated in the same way that HMR taxes are correlated across communities. The large jump in sales tax collections in 2001 was due to an increase in the tax rate, rather than any change in underlying taxable sales. Similarly, as the population of Fayetteville increases more quickly or less quickly, it is reasonable to believe that HMR collections might follow suit. However, the magnitude of the change in population does not appear to have any correlation with the HMR taxes collected in the same year.

Table 3: Fayetteville Economic Indicators

	HMR Tax Collections	HMR Tax Collections Growth Rate	Sales Tax Collections	Sales Tax Collections Growth Rate	Fayetteville Population	Fayetteville Population Growth Rate
2000	$1,220,464	5.3%	$14,935,563	31.2%	58,285	0.2%
2001	$1,312,806	7.6%	$24,929,377	66.9%	59,196	1.6%
2002	$1,444,474	10.0%	$23,278,474	-6.6%	60,382	2.0%
2003	$1,538,023	6.5%	$23,495,793	0.9%	62,366	3.3%
2004	$1,734,301	12.8%	$25,895,484	10.2%	64,190	2.9%
2005	$1,918,371	10.6%	$27,833,758	7.5%	NA	NA

Regional, State, and National Economic Indicators

The economy of Fayetteville does not exist in a bubble, but rather, is affected enormously by what happens in the wider economy. Therefore, when examining changes in Fayetteville's economic indicators, it is important to consider the status of the wider economy. Table 4 presents available data for some important state and national economic indicators. Gross domestic product (GDP) is the standard measure of the national economy's output and its growth rate is probably the single best indicator of the health of the macro economy. Likewise gross state product (GSP) measure the output of the state. Per capita personal income demonstrates the consumption power of the average citizen of the state of Arkansas and its growth rate is an indicator of changes in overall standard of living.

Table 4: State and National Economic Indicators

	Real GDP (in billions)	Real GDP Growth Rate	U.S. Per Capita Personal Income	U.S. Per Capita Income Growth Rate	Arkansas Real GSP (in millions)	Arkansas Real GSP Growth Rate	Arkansas Per Capita Personal Income	Arkansas Per Capita Income Growth Rate
1994	$7,835.5	4.0%	$22,172	3.9%	$53,859	5.3%	$17,350	4.4%
1995	$8,031.7	2.5%	$23,076	4.1%	$56,062	4.1%	$18,076	4.2%
1996	$8,328.9	3.7%	$24,175	4.8%	$58,448	4.3%	$18,926	4.7%
1997	$8,703.5	4.5%	$25,334	4.8%	$62,474	6.9%	$19,590	3.5%

	Real GDP (in billions)	Real GDP Growth Rate	U.S. Per Capita Personal Income	U.S. Per Capita Income Growth Rate	Arkansas Real GSP (in millions)	Arkansas Real GSP Growth Rate	Arkansas Per Capita Personal Income	Arkansas Per Capita Income Growth Rate
1998	$9,066.9	4.2%	$26,883	6.1%	$63,751	2.0%	$20,489	4.6%
1999	$9,470.3	4.4%	$27,939	3.9%	$66,628	4.5%	$21,137	3.2%
2000	$9,817.0	3.7%	$29,845	6.8%	$66,176	-0.7%	$21,925	3.7%
2001	$9,890.7	0.8%	$30,574	2.4%	$66,656	0.7%	$23,023	5.0%
2002	$10,048.8	1.6%	$30,810	0.8%	$68,060	2.1%	$23,363	1.5%
2003	$10,320.6	2.7%	$31,484	2.2%	$69,734	2.5%	$24,329	4.1%
2004	$10,755.7	4.2%	$33,050	5.0%	$73,411	5.3%	$25,814	6.1%
2005	$11,134.8	3.5%	$34,586	4.6%	NA	NA	$26,874	4.1%

Additionally, Fayetteville is greatly influenced by the health of the entire Northwest Arkansas region. As the area has experienced above average growth rates in per capita income and employment and below average unemployment rates for the past decade, Fayetteville has shared in the prosperity. Table 5 details how the Fayetteville-Springdale-Rogers MSA has fared since 1994. Employment and personal income growth have been brisk. The annual unemployment rates have not risen above 3.7 percent, while the national unemployment rates have reached 6 percent and higher during the same period. The region has been relatively sheltered from the swings of the national business cycle due to its unique mix of retail, trucking, and manufacturing employment.

Table 5: Fayetteville-Springdale-Rogers Economic Indicators

	Per Capita Personal Income	Per Capita Income Growth Rate	Employment	Employment Growth Rate	Unemployment Rate	Unemployment Rate Change
1994	$18,360	4.1%	131,500	7.1%	2.6%	-0.5
1995	$18,904	3.0%	138,600	5.4%	2.5%	-0.1
1996	$19,478	3.0%	142,900	3.1%	3.0%	0.5
1997	$20,022	2.8%	146,700	2.7%	3.1%	0.1
1998	$21,052	5.1%	150,000	2.2%	3.1%	0
1999	$21,995	4.5%	155,900	3.9%	2.5%	-0.6
2000	$22,834	3.8%	162,000	3.9%	2.9%	0.4
2001	$24,094	5.5%	170,300	5.1%	3.0%	0.1
2002	$24,703	2.5%	176,800	3.8%	3.3%	0.3
2003	$25,376	2.7%	181,800	2.8%	3.7%	0.4
2004	$27,122	6.9%	188,300	3.6%	3.6%	-0.1
2005	NA	NA	198,300	5.3%	3.0%	-0.6

Bentonville, Rogers, Springdale, Fort Smith, and Little Rock Economic Indicators

For comparison purposes, it is useful to see how the economic indicators of the cities and regions within Arkansas differed during the past decade. Tables 6-9 demonstrate the differences among the regions. Table 6 presents the levels and changes in per capita personal income in Northwest Arkansas, Fort Smith, and Little Rock since 1994. Table 7 presents the levels and changes in non-farm employment during the same time period. Interestingly, Northwest Arkansas has experienced smaller per capita personal income

compared to Little Rock-North Little Rock MSA since 1994, while its employment growth far outpaced other areas of Arkansas. This suggests that Northwest Arkansas is creating a wide variety of jobs, but that the average wage rate for these new jobs is not necessarily as high as the average wage rate elsewhere in the state. Both Figures 4 and 5 detail employment comparisons by MSA.

Table 6: Per Capita Personal Income by MSA

	Fayetteville-Springdale-Rogers MSA Per Capita Personal Income	Growth Rate	Fort Smith MSA Per Capita Personal Income	Growth Rate	Little Rock-North Little Rock MSA Per Capita Personal Income	Growth Rate
1994	$18,360	4.1%	$16,939	6.5%	$20,623	3.8%
1995	$18,904	3.0%	$17,417	2.8%	$21,666	5.1%
1996	$19,478	3.0%	$17,943	3.0%	$22,844	5.4%
1997	$20,022	2.8%	$18,628	3.8%	$23,597	3.3%
1998	$21,052	5.1%	$19,574	5.1%	$24,930	5.6%
1999	$21,995	4.5%	$20,303	3.7%	$25,691	3.1%
2000	$22,834	3.8%	$21,501	5.9%	$26,960	4.9%
2001	$24,094	5.5%	$22,760	5.9%	$28,126	4.3%
2002	$24,703	2.5%	$22,765	0.0%	$29,157	3.7%
2003	$25,376	2.7%	$23,345	2.5%	$29,690	1.8%
2004	$27,122	6.9%	$24,802	6.2%	$31,283	5.4%
2005	NA	NA	NA	NA	NA	NA

Table 7: Non-farm Employment and Growth Rates by MSA

	Fayetteville-Springdale-Rogers MSA	Growth Rate	Fort Smith MSA	Growth Rate	Little Rock-North Little Rock MSA	Growth Rate
1994	131,500	7.1%	103,700	5.1%	286,400	3.6%
1995	138,600	5.4%	106,300	2.5%	295,900	3.3%
1996	142,900	3.1%	108,000	1.6%	302,800	2.3%
1997	146,700	2.7%	109,900	1.8%	308,300	1.8%
1998	150,000	2.2%	111,700	1.6%	314,000	1.8%
1999	155,900	3.9%	114,700	2.7%	319,200	1.7%
2000	162,000	3.9%	116,000	1.1%	321,600	0.8%
2001	170,300	5.1%	117,000	0.9%	324,300	0.8%
2002	176,800	3.8%	115,600	-1.2%	320,800	-1.1%
2003	181,800	2.8%	115,300	-0.3%	323,400	0.8%
2004	188,300	3.6%	116,900	1.4%	328,200	1.5%
2005	198,300	5.3%	119,900	2.6%	333,800	1.7%

Figure 4: Non-farm Employment by MSA

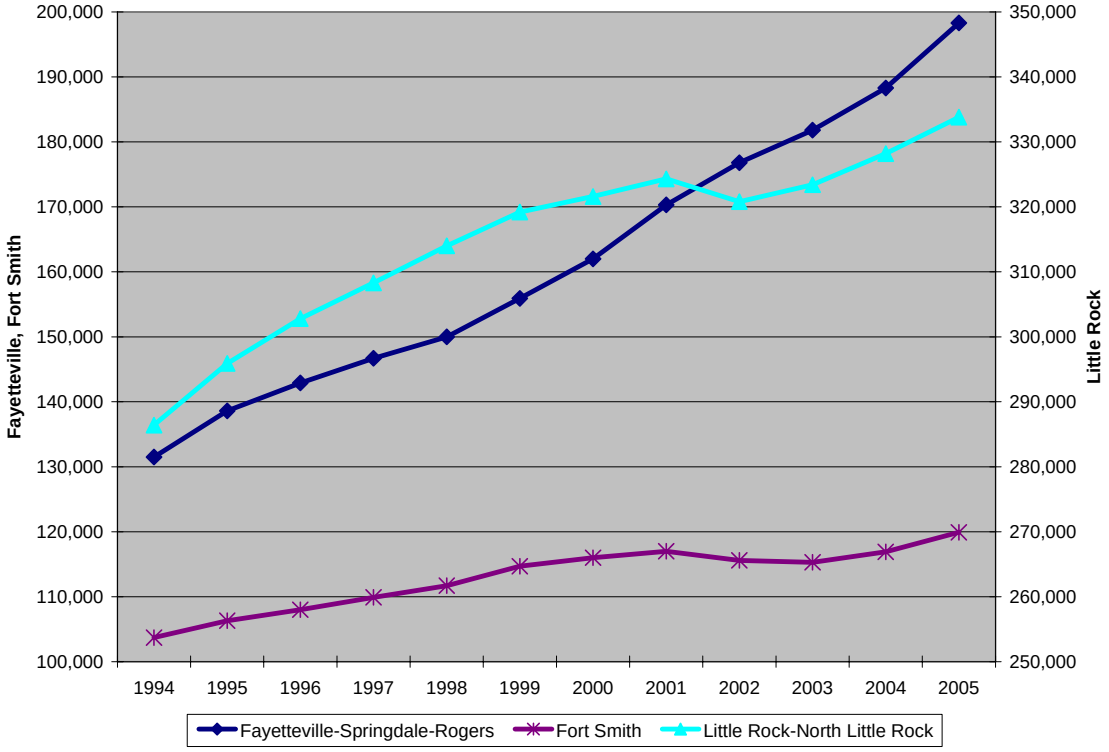
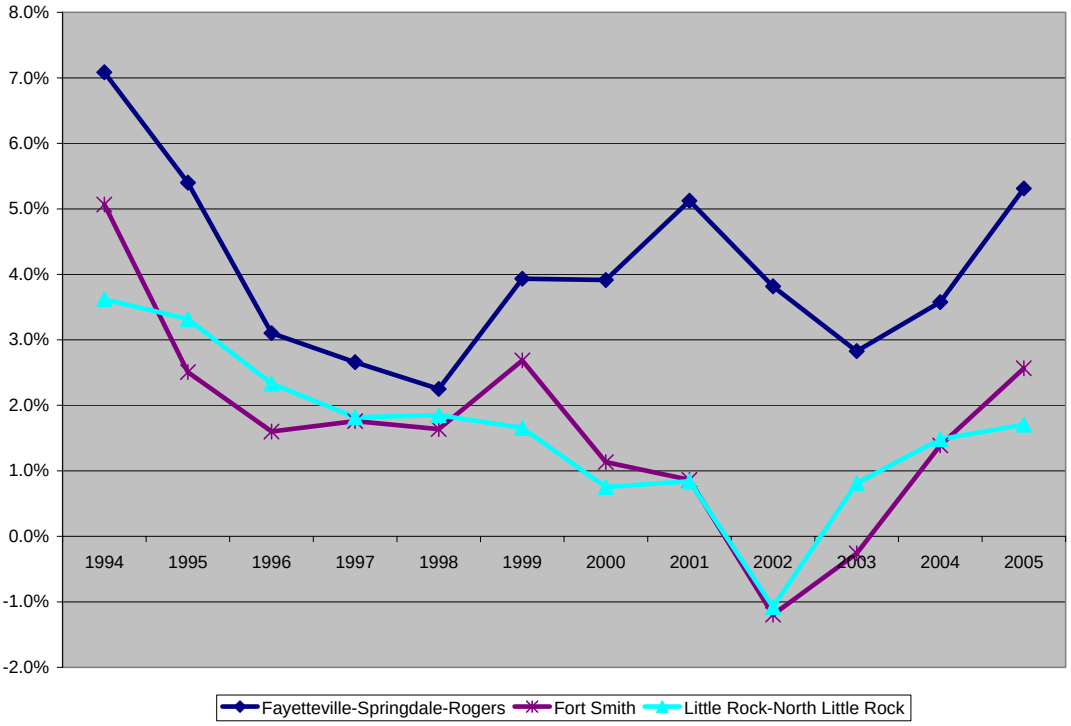


Figure 5: Employment Growth Rates by MSA

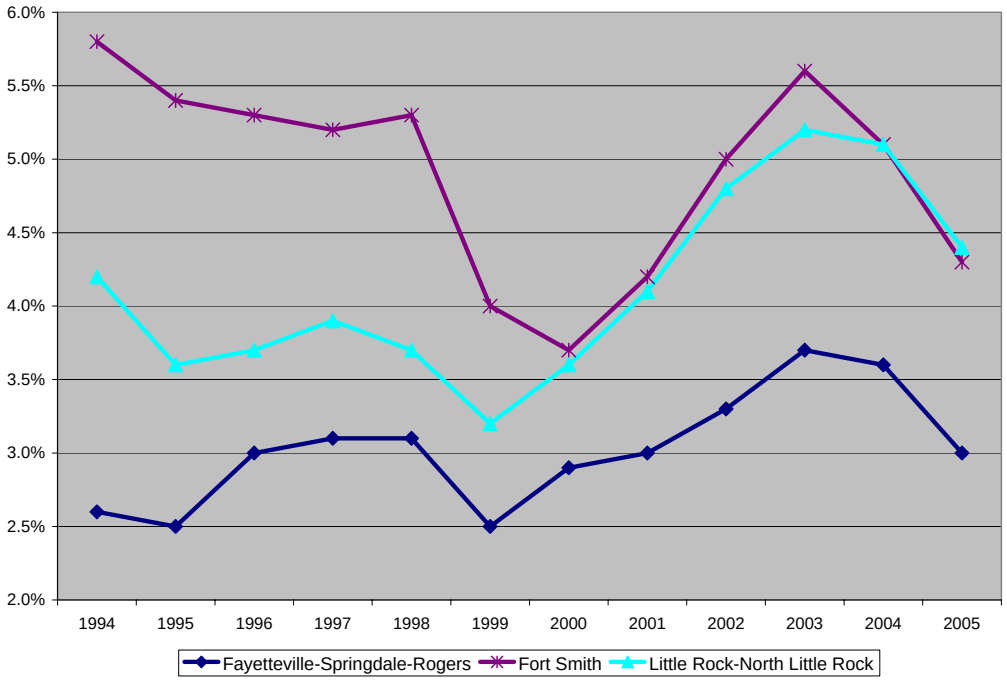


Understanding unemployment rates is also helpful when examining the economic status of a community. Table 8 and Figure 6 present the recent history of unemployment rates in the regions of Arkansas. The Northwest Arkansas MSA consistently has had unemployment rates between 1.0 and 1.5 percentage points lower than Little Rock. The unemployment rate in Fort Smith has sometimes been double that in Northwest Arkansas. These statistics point to dramatically expanding employment and a labor force base that has not been able to keep up with the demand for employees in the Northwest Arkansas region.

Table 8: Unemployment Rates by MSA

	Fayetteville-Springdale-Rogers MSA	Change	Fort Smith MSA	Change	Little Rock-North Little Rock MSA	Change
1994	2.6%	-0.5	5.8%	-1.2	4.2%	-0.7
1995	2.5%	-0.1	5.4%	-0.4	3.6%	-0.6
1996	3.0%	0.5	5.3%	-0.1	3.7%	0.1
1997	3.1%	0.1	5.2%	-0.1	3.9%	0.2
1998	3.1%	0	5.3%	0.1	3.7%	-0.2
1999	2.5%	-0.6	4.0%	-1.3	3.2%	-0.5
2000	2.9%	0.4	3.7%	-0.3	3.6%	0.4
2001	3.0%	0.1	4.2%	0.5	4.1%	0.5
2002	3.3%	0.3	5.0%	0.8	4.8%	0.7
2003	3.7%	0.4	5.6%	0.6	5.2%	0.4
2004	3.6%	-0.1	5.1%	-0.5	5.1%	-0.1
2005	3.0%	-0.6	4.3%	-0.8	4.4%	-0.7

Figure 6: Unemployment Rates by MSA



Finally, Table 9 details the collections and growth rates in collections in the HMR and A&P tax collections within selected cities of Arkansas. These data were used to calculate the correlation matrix presented earlier and again demonstrate the differences in economic growth rates within the state.

Table 9: Selected Arkansas City A&P Collections

	Bentonville	Growth Rate	Fort Smith	Growth Rate	Little Rock	Growth Rate	Rogers	Growth Rate	Springdale	Growth Rate
2000	$643,756	14.7%	$324,050	11.1%	$6,676,402	8.6%	$78,895	NA	$206,484	9.6%
2001	$707,913	10.0%	$379,347	17.1%	$6,776,128	1.5%	$93,540	18.6%	$210,163	1.8%
2002	$753,110	6.4%	$511,361	34.8%	$7,028,424	3.7%	$153,007	63.6%	$232,984	10.9%
2003	$813,512	8.0%	$522,651	2.2%	$7,263,996	3.4%	$261,762	71.1%	$234,166	0.5%
2004	$893,935	9.9%	$541,682	3.6%	$7,934,324	9.2%	$357,469	36.6%	$252,959	8.0%
2005	$1,006,292	12.6%	$596,041	10.0%	$8,701,142	9.7%	$398,473	11.5%	$267,868	5.9%

Methodology

Once baseline data were collected for the wide variety of variables that influence the economic activity in the city of Fayetteville, several models were developed to help identify the relationships among these variables and to provide a context for determining whether the ban on smoking in public places in Fayetteville has an identifiable impact. Initial regressions were estimated for these models with annual data from the years 2000-2005. While it would have been preferable to use monthly or quarterly data, in many cases not all variables were available in these forms.

Growth in population was found to co-vary so highly with some of the other economic data series that it is not included in the models because of multicollinearity issues. Three alternative specifications of an economic model are provided. The first model investigates the relationship between HMR tax collections, per capita personal income levels, real GDP levels, employment growth, and the existence of a smoking ban within the community. Model 2 demonstrates the relationship between the growth in HMR collections and the growth rates of per capita personal income, real GDP, and employment, as well as the existence of a smoking ban. Finally, Model 3 estimates how changes in per capita personal income levels, GDP growth, employment growth, and the imposition of a smoking ban affect the level of HMR collections. The models are detailed below.

Model 1:

$$HMR_t = \beta_0 + \beta_1 PCPI_t + \beta_2 RGDP_t + \beta_3 EmpGrowth_t + \beta_4 SmokingBan_t + \varepsilon_t$$

Model 2:

$$HMR\,Growth_t = \beta_0 + \beta_1 PCPI\,Growth_t + \beta_2 RGDP\,Growth_t + \beta_3 EmpGrowth_t + \beta_4 SmokingBan_t + \varepsilon_t$$

Model 3:

$$HMR_t = \beta_0 + \beta_1 PCPI_t + \beta_2 RGDP\,Growth_t + \beta_3 EmpGrowth_t + \beta_4 SmokingBan_t + \varepsilon_t$$

Table 10 presents the results of the initial estimation of the three regression models. The t-statistics for each coefficient estimate are provided in parentheses below the estimate. Statistical significance at the 95 percent level is denoted with an asterisk. The Model 1 and Model 3 specifications do the best job of explaining the variation in HMR taxes with the variation in the explanatory variables. Each of the variables has a significant impact, although the covariance among the explanatory variables makes the signs of the coefficients different than expected. The results obtained here are similar to the results of 2005 project, while more observations allowed explaining the economic impact better in 2006 (R squares increased). Model 2 does not fit the data nearly as well, which is consistent with the last year results as well.

Table 10: Baseline Regression Results

Variable	Model 1	Model 2	Model 3
Constant	-8,068,530 (-0.41)	0.20 (2.08*)	-2,018,338 (-0.33)
Per Capita Personal Income	-266 (-0.18)	--	256 (0.94)
Real GDP	1,790 (0.35)	--	--
Employment Growth	-75,113,143 (-3.41*)	0.53 (0.35)	-74,872,039 (-3.40*)
Smoking Ban	642,958 (0.35)	-0.005 (-0.04)	728,513 (0.40)
Per Capita Personal Income Growth	--	-2.19 (-1.04)	--
Real GDP Growth	--	0.19 (0.08)	-7,690,843 (-0.21)
R Square	0.28	0.04	0.28

In none of the models is the coefficient on the smoking ban dummy variable statistically significant. This indicates that for the limited amount of data available the effects of the public policy change are dwarfed by other economic factors.

Since it can be argued that alcohol sales are most affected by the smoke-free ordinance, CBER researches ran additional regressions for this report. In these regressions Fayetteville Supplemental Beverage taxes were used instead of HMR taxes (the Supplemental Beverage tax of 5% is included in the percentage charged for mixed drinks and any malt liquor containing over 5% alcohol). The results were very similar to those reported in Table 10, indicating no statistically significant effect of smoking ban variable on alcoholic beverage sales.

Conclusions

The results show that in two years after its implementation, the smoke-free ordinance in Fayetteville has had no statistically significant effect on the amount of HMR taxes

collected. The years 2004 and 2005 were ones of significant economic growth for all of Northwest Arkansas. The drivers of that growth appear to outweigh any effects that the smoke free ordinance might have had on economic activity. Many other variables, many that are not readily available as data, influence the level of collections of HMR taxes and the impact of the policy change may be dwarfed by the influence of things like changes in per capita personal income, national output, and regional employment growth. Additionally, the restaurant business is inherently risky and management decisions may affect the economic outcome of any particular establishment. This study provides a first look at the after-effects of the ordinance, but the results should be viewed with caution as conclusions are drawn from a small number of data points.