

**The Economic Impact of Ohio's Smoke-free Law on
Bordering Northern Kentucky Counties**

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Executive Summary

There is no evidence that total employment, total wages paid, or the number of reporting establishments increased in bordering Northern Kentucky counties following the implementation of the Ohio statewide smoke-free law. Although levels of these economic indicators generally increased in border counties of Kentucky following the Ohio law, so did the levels in non-bordering Kentucky counties and the increases were not significantly different between the two groups of counties. Further, after controlling for other influences over time, such as population, general unemployment levels, and income levels, we find no economic effect from the Ohio smoke-free law on bordering Kentucky counties. In secondary results, we also find no significant influence from the law on economic activity for either border or non-border Ohio counties. The change in economic activity was also not significantly different between the respective Ohio and Kentucky border counties. We examined employment data obtained from U.S. Department of Labor's Bureau of Labor Statistics (BLS) from January 2001 and through 2007 in all reporting Kentucky and Ohio counties, specifically focusing on six Northern Kentucky border counties (Boone, Campbell, Greenup, Kenton, Lewis, and Mason). We report results from 6 years before Ohio's law went into effect and 1 year after the law.

Purpose of the research study: To determine whether Ohio's statewide smoke-free law had a measurable impact on employment levels, wages paid, and number of reporting establishments in bordering Northern Kentucky counties. A secondary aim was to examine the impact of the law on the Ohio counties bordering Northern Kentucky compared to the non-border Ohio counties.

Background: Over the last quarter century, numerous communities across the U.S. have enacted smoke-free legislation in indoor workplaces. The implementation of such action has been the subject of much debate. It has been argued that smoking is a "right" that is up to the discretion of the individual rather than legislative decisions. However, the scientific evidence is clear and irrefutable that secondhand smoke is a significant public health risk and the third leading cause of preventable death in the U.S.¹

Another issue that often spurs controversy is the potential effect of smoke-free laws on the local economy. More specific to this study, some policymakers fear that certain industries (namely hospitality industries) might suffer as a result of these legal restrictions and that businesses such as restaurants and bars might need to be exempt from the legislation. The underlying argument is that people are more prone to smoke when they drink and that preventing the former activity might also prevent the latter (and, in addition, food consumption), with the net result being a significant decrease in revenues for the business.^{2,3} The overwhelming majority of published works disagree with this premise.^{4,5} Further, studies that do find a negative influence are typically based upon subjective measures, such as predictions or subjective estimates of impact by owners or patrons.

Kentucky is a traditionally tobacco intensive state both in production and use, while Ohio falls well behind in both areas. In Spring 2004, Lexington-Fayette County implemented the first smoke-free ordinance in the state of Kentucky. Pyles et al. (2007) examined the influence of this legislation on employment and business closures and found no evidence of negative impact.⁶ The largest city in the state, Louisville, followed a little more than a year later and since then a total of 24 cities and/or counties in Kentucky have enacted smoke-free ordinances or Board of Health regulations. Of those, the only Kentucky county bordering on Ohio that had a smoke-free ordinance was Boyd County, in which the City of Ashland went smoke-free in October 2006.

In November 2006, Ohio enacted a statewide smoke-free law prohibiting smoking in all workplaces and enclosed public places. Currently, there are discussions regarding implementing similar smoke-free legislation in Northern Kentucky counties that border Ohio. Opponents of such proposed laws argue that the local economy in these Northern Kentucky counties has benefitted from individuals crossing the state line to smoke following Ohio's smoke-free law and that implementation of similar legislation would mitigate this benefit.

Study Methods: The primary intent of this study is to examine any "spillover" effects from Ohio's smoke-free law. Specifically, we examine three quarterly economic indicators: (1) employment levels, (2) total wages paid, and (3) the number of reporting establishments for all food services and accommodations firms in each county, and

compare Kentucky border counties, non-border counties, and the southern Ohio counties. We compute quarterly averages for each indicator after the Ohio smoke-free law and compare them to the averages before the law. We also estimate robust economic models for each of the three indicators to more precisely address the potential impact of Ohio's smoke-free law on each economic indicator in bordering Kentucky counties. In secondary results, we also examine the impact on both bordering and non-border Ohio counties and compare Kentucky and Ohio border counties.

Data Sources: We examine employment data obtained from United States Department of Labor's Bureau of Labor Statistics (BLS). Our sample begins in January 2001 and goes through 2007. For each county, we have a maximum of 24 pre-law quarterly observations and four post-law observations. Our analyses include all Kentucky and Ohio counties; however, the focus is on six Northern Kentucky border counties (Boone, Campbell, Greenup, Kenton, Lewis, and Mason).

Data Analysis and Interpretation: We begin with a simple before and after comparison of the quarterly averages of the economic indicators in all reporting Kentucky counties. More specifically, we separate the counties into two subgroups (1) border counties and (2) non-border counties. We then examine whether the difference in economic indicators before and after Ohio's law is statistically different for border counties relative to non-border counties in Kentucky. However, these simple comparisons do not answer the question of whether the law itself resulted in a change in the economic indicators. Robust statistical models were implemented to control for other potential economic influences and area-specific results.

Findings:

We primarily examine five industry samples: (1) all food services and accommodations, (2) all accommodation services, (3) all food services, (4) restaurant services, and (5) drinking establishments for Kentucky counties. For all except drinking establishments, employment levels, wages, and the number of establishments increased in the time period following the Ohio smoke-free law, but not always to a significant degree. This is true of both border and non-bordering Kentucky counties. Further, there is no evidence suggesting the increase was disproportionately larger in border counties than in their non-border counterparts. In secondary results, we also find little significant relation between the smoke-free law and the economic indicators in either border or non-border Ohio counties and conclude economic activity remained largely unchanged following the smoke-free law. Changes in economic activity following the law were similar for Kentucky and Ohio border counties.

Note: Throughout discussion of the following, "significance" implies statistical significance. When examining before and after the law values in an effort to determine whether significant differences exist, it is insufficient to simply compare the raw numbers. Statistical significance takes into account not only these raw values, but the variability that exists in these values as well. The result of such analyses is an output value (commonly labeled p-value) that measures the significance of the differences in average

values from two groups of counties (border and non-border). Generally speaking, a p-value less than .05 indicates significant difference while any value in excess of .05 suggests the values are not statistically different, meaning the differences are likely due to chance and not real differences.

Table 1 examines the average difference in pre-and post values on a county basis, segmented by border and non-border Kentucky counties. Panel A examines all food and accommodation services. Panel B examines only accommodation services while Panel C examines only food services. Panels D and E examine restaurant and drinking services, respectively. Figures 1 through 15 depict weighted average values for each of the three indicator variables.

Note: For Figures 1 through 15, the values graphed are weighted averages, where the weighting factor is each county's labor force value. Since the numbers are combinations of different county averages, a simple arithmetic average would give equal weighting to each county, regardless of size. Instead, the reported values give proportional weight to each county. Thus, interpretation of the values becomes a bit cumbersome, but the validity of the "averages" also increases considerably.

Both border and non-border Kentucky counties experienced increased economic activity in all food and accommodation services.

This is the broadest sample and; thus, our primary focus. Figures 1-3 show the quarterly trend in employment, wages, and number of establishments for both border and non-border Kentucky counties. The patterns are generally the same.

Each graph has a vertical line indicating the beginning of the post-law period. If there were a spillover effect of Ohio's law into Kentucky, we would expect to see a relatively dramatic rise during the last four quarters of the sample for border counties (and not, or to a lesser degree, for non-bordering counties) and this does not appear to be the case. The weighted average figures are significantly higher following the law for both border counties and their non-border Kentucky counterparts.

Panel A in Table 1 shows that the average increase in total employees was 22.7% for border counties, compared to a 10.3% increase for non-border Kentucky counties. However, once controlling for variability in the values for each group of counties, the difference is not statistically significant. The same is true for wages paid and number of reporting establishments. In other words, there is no statistical evidence that border counties experienced any additional increases in economic activity relative to non-border counties in Kentucky. The same is true when examining Kentucky border counties versus their Ohio border counterparts. Again, the rate of increase in economic activity appears to be approximately the same.

Total employment remained relatively stable for accommodation services, while wages and the number of establishments increased following the Ohio smoke-free law in both border and non-border Kentucky counties.

Panel B of Table 1, along with Figures 4-6 indicate the relative patterns of employment, wages, and number of establishments were again similar for both border and non-border Kentucky counties. While the increases in each of the three indicators were higher for border counties, there is again no statistically significant difference once accounting for variability.

Economic activity in the food services industry of border counties remained relatively stable following the law, while the values significantly increased for non-border counties in Kentucky.

These findings are opposite that of the theory of smoker “spillover” from neighboring Ohio counties. Figures 7-9 depict employment, wages, and establishment numbers for the food services industry and show economic activity for border and non-border counties followed a similar pattern. The underlying values pre and post-law are significantly different for non-border counties, but not so for border counties. However, Panel C of Table 1 shows increases in each of the indicator variables to be insignificantly different between the two subgroups.

Economic activity in restaurants increased in both border and non-border Kentucky counties in similar fashion.

Figures 10-12 show both groups of Kentucky counties (border and non-border) experienced an increase in economic activity at the same approximate rate. While the average percentage change values for border counties in Table 1 seem very large relative to the non-border values, the values are misleading. The border county variables are driven by one border county (Greenup) which experienced a very high percentage increase in the economic indicators following the law, primarily due to the fact that the values on which the percentages are based are very small.

Economic activity in bars generally remained stable following the law for both border and non-border counties.

Panel E of Table 1, along with Figures 13-15 show a similar pattern. Both border and non-border Kentucky counties experienced approximately the same changes in economic activity for both border and non-border counties throughout the sample period following the Ohio law.

Note: Once we take into account population sizes, unemployment, county-specific effects, and seasonal variations the result of no economic impact remains intact. Thus, it does not appear that Kentucky border counties benefitted from the Ohio smoke-free law.

References

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Table 1: Percentage Differences in Pre- and Post Ohio Law Economic Indicators In Kentucky Border and Non-bordering Counties

The following table presents average percentage differences in pre- and post Ohio smoke-free law values of total employment (*TotEmp*), total wages paid (*Wages*) and number of reporting establishments (*Estab*). For each county, the percentage change is calculated as $((\text{PostValue} - \text{PreValue}) / \text{PreValue}) * 100$. The reported values are averages of these calculated values for each group of counties.

Panel A: All food services and accommodations			
	Border Counties	Non-Border Counties	p-value
TotEmp	22.74	10.28	.1718
Wages	28.42	18.40	.2780
Estab	14.65	23.32	.5388

Panel B: All accommodation services			
	Border Counties	Non-Border Counties	p-value
TotEmp	9.57	2.70	.6209
Wages	19.63	10.84	.6373
Estab	5.97	4.41	.8872

Panel C: All food services			
	Border Counties	Non-Border Counties	p-value
TotEmp	21.02	8.51	.0981
Wages	21.30	16.62	.5889
Estab	14.12	11.89	.4651

Panel D: Restaurants			
	Border Counties	Non-Border Counties	p-value
TotEmp	119.20	1.42	.3457
Wages	66.09	9.71	.3883
Estab	45.40	12.36	.2714

Panel E: Drinking establishments			
	Border Counties	Non-Border Counties	p-value
TotEmp	-6.93	.31	.7386
Wages	10.37	3.97	.8460
Estab	5.06	-1.65	.6542

Figure 1: Weighted Average Total Employment in All Food and Accommodation Services in Kentucky Counties

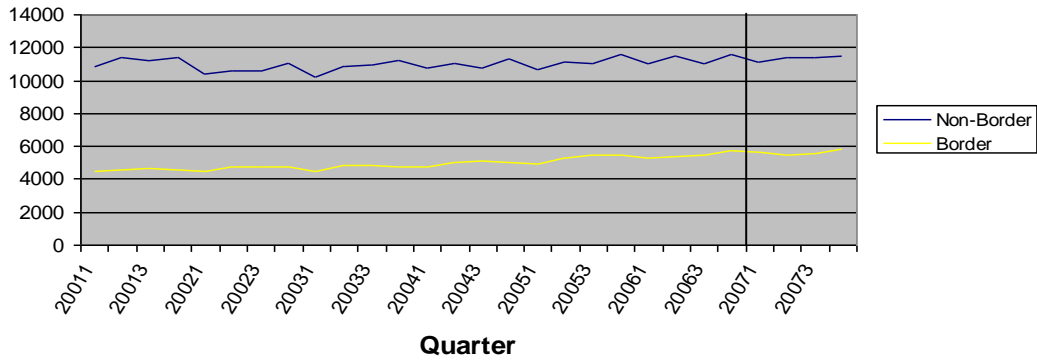


Figure 2: Weighted Average Total Wages Paid in All Food and Accommodation Services in Kentucky Counties

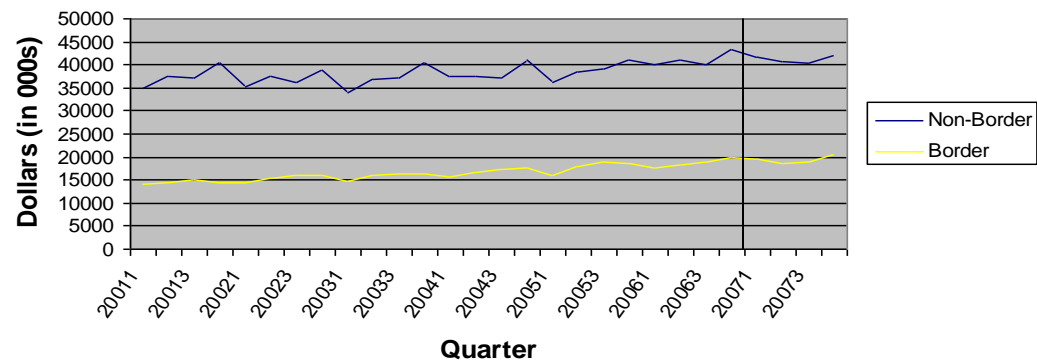


Figure 3: Weighted Average Number of Reporting Establishments in All Food and Accommodation Services in Kentucky Counties

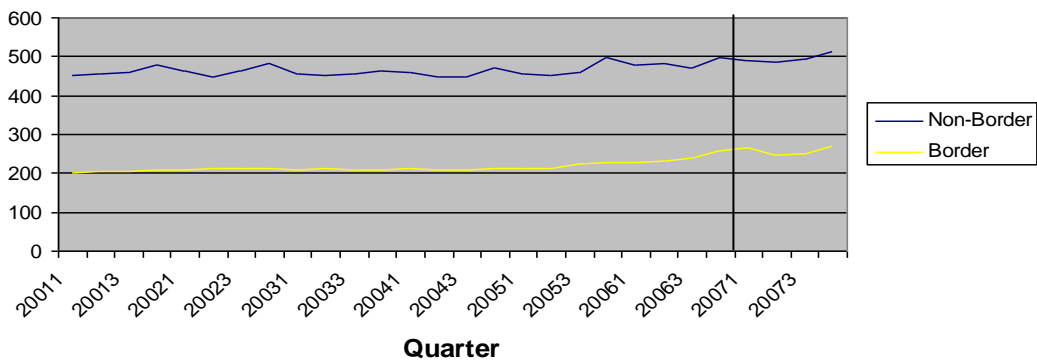


Figure 4: Weighted Average Total Employment in All Accommodation Services in Kentucky Counties

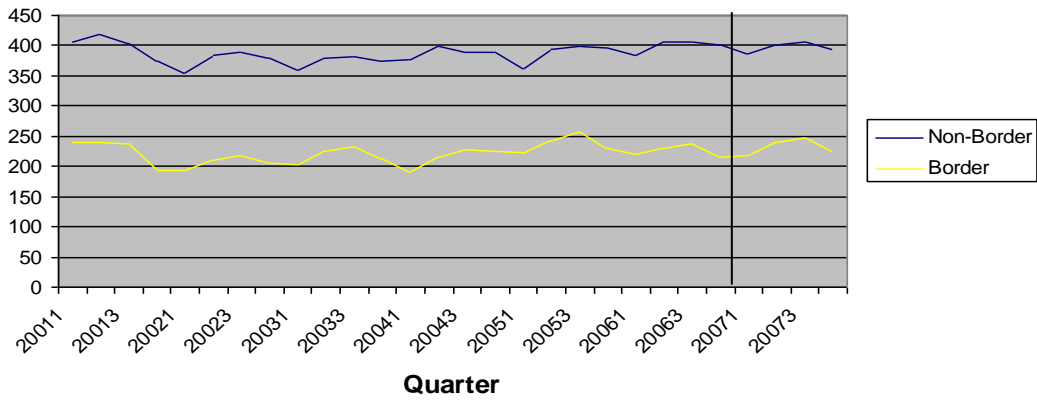


Figure 5: Weighted Average Total Wages Paid in All Accommodation Services in Kentucky Counties

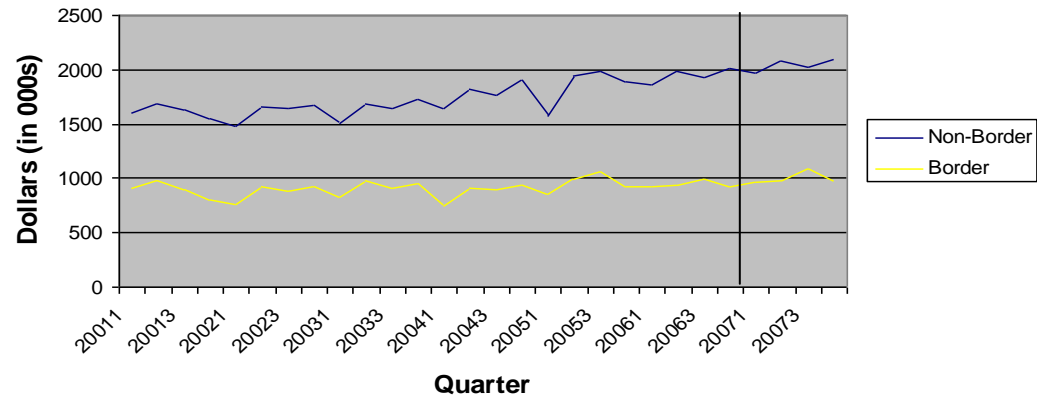


Figure 6: Weighted Average Total Number of Reporting Establishments in All Accommodation Services in Kentucky Counties

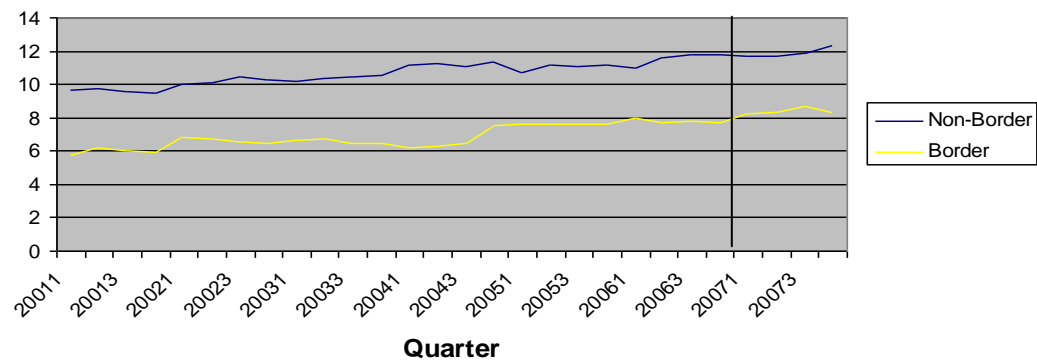


Figure 7: Weighted Average Total Employment in All Food Services in Kentucky Counties

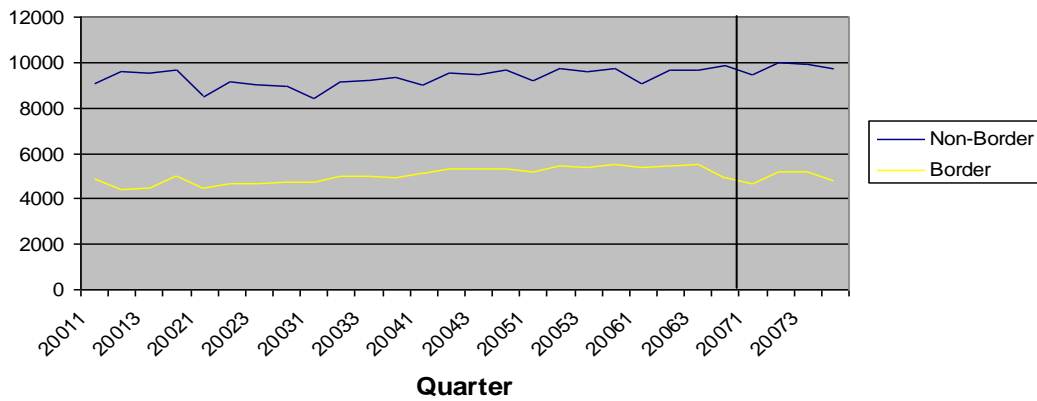


Figure 8: Weighted Average Total Wages Paid in All Food Services in Kentucky Counties

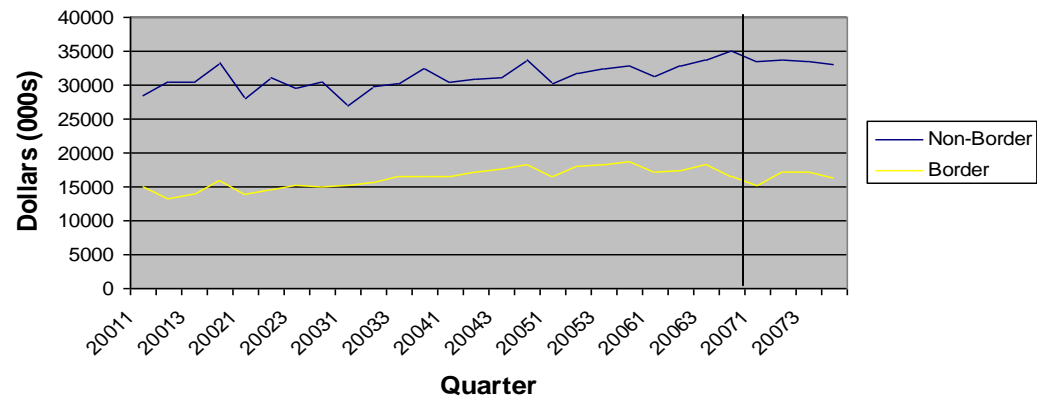


Figure 9: Weighted Average Number of Reporting Establishments in All Food Services in Kentucky Counties

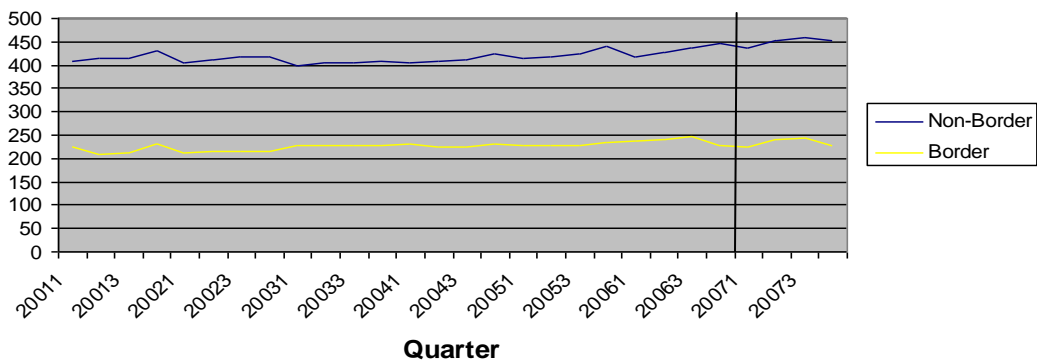


Figure 10: Weighted Average Total Employment in Restaurants in Kentucky Counties

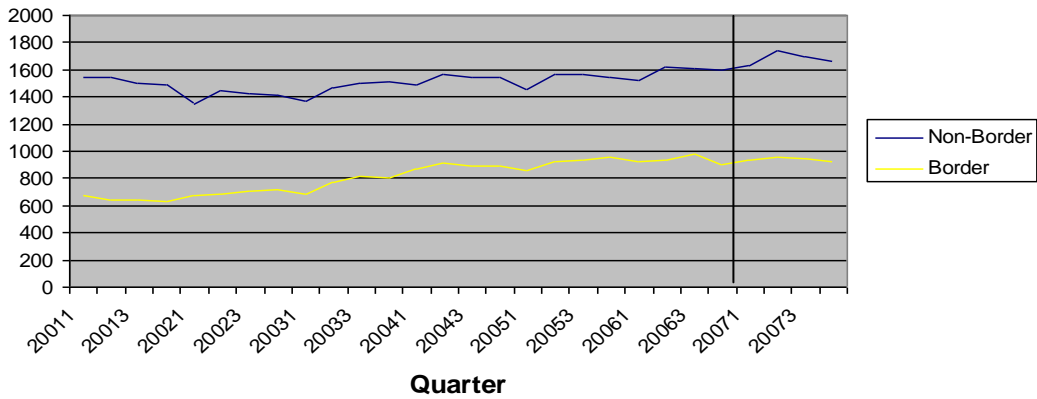


Figure 11: Weighted Average Total Wages Paid in Restaurants in Kentucky Counties

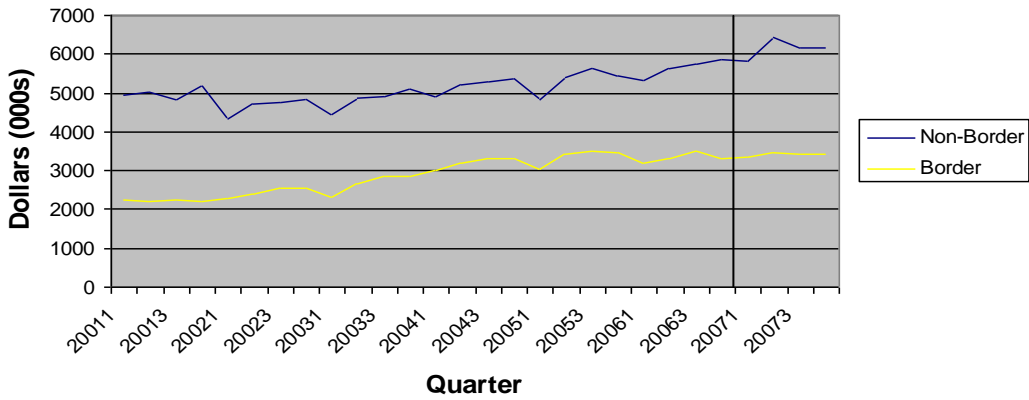


Figure 12: Weighted Average Number of Reporting Establishments in Restaurants in Kentucky Counties

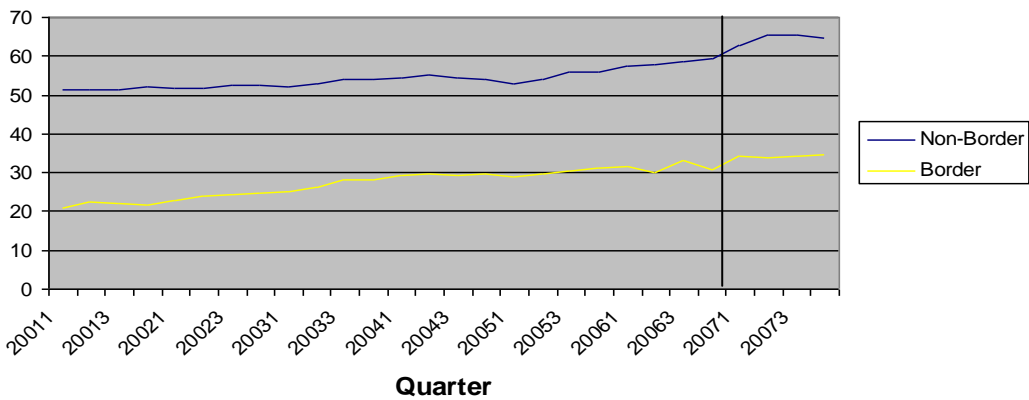


Figure 13: Weighted Average Total Employment for Drinking Establishments in Kentucky Counties

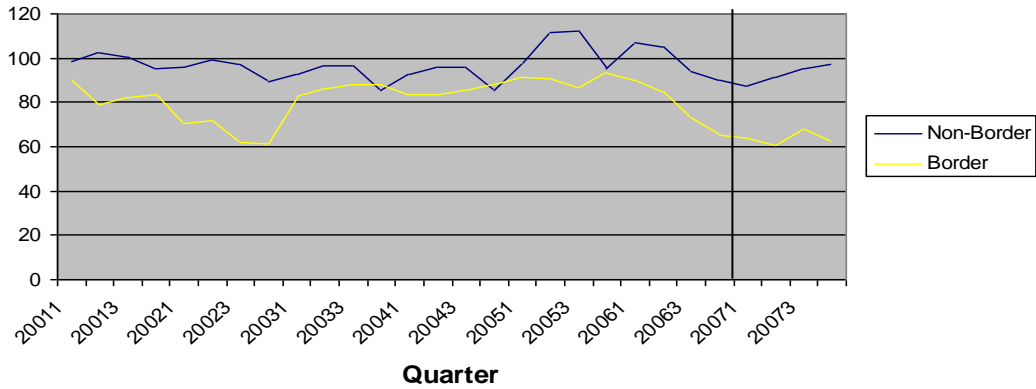


Figure 14: Weighted Average Total Wages Paid in Drinking Establishments in Kentucky Counties

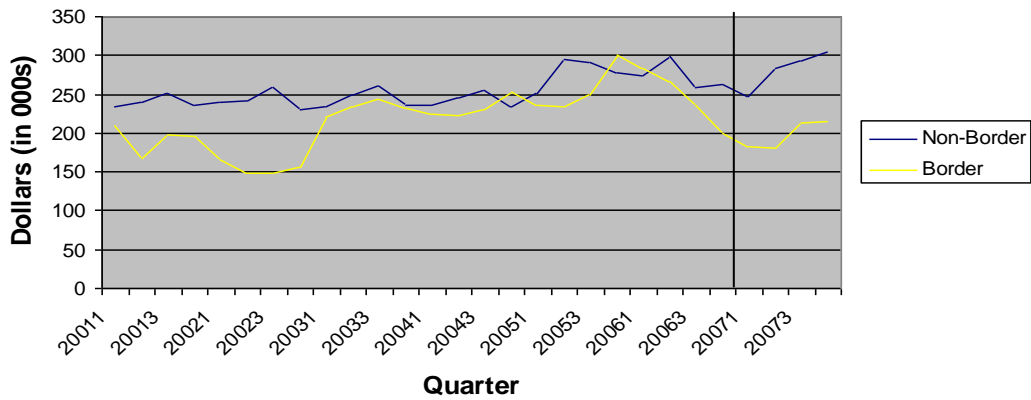


Figure 15: Weighed Average Number of Reporting Establishments in Drinking Establishments in Kentucky Counties

