The Economic Impact of the 2008 Fargo and West Fargo Smoking Bans

A 2010 analysis of tax and survey data to assess the economic impact of the current smoking bans on bars in Fargo and West Fargo, North Dakota

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Preface

On June 10, 2008, Fargo and West Fargo residents were asked to vote on a comprehensive smoking ban in each city which would eliminate smoking in environments previously excluded under the 2005 North Dakota smoke-free law. The ordinances passed and, on July 1, 2008, comprehensive smoking bans were implemented in Fargo and West Fargo which banned smoking in all bars and truck stops within the cities' limits.

The economic impact that these smoking bans have had on these industries within Fargo and West Fargo is relatively unknown. The purpose of this project is to assess the economic impact of the smoking bans on businesses, specifically bars, within Fargo and West Fargo. Our approach was threefold. First, we conducted a horizontal and vertical analysis of the Accommodation and Food Services industries in Fargo, West Fargo, and Grand Forks. Second, we conducted a regression analysis of the tax data for these industries in Fargo and West Fargo. These first two sections took a macroeconomic approach and utilized tax data for Fargo and West Fargo. The city of Grand Forks, which currently allows smoking in bars, served as a benchmark for the horizontal and vertical analysis. Third, we conducted a random survey of bar employees in Fargo and West Fargo to determine perceptions of changes in drinking establishments in the last two years.

By analyzing the tax and survey data using objective scientific approaches, we hope to provide policy makers and other key leaders with insight into the impact of such legislation. Moreover, the wisdom gained through the experience of using a triangulated approach for the analysis may serve as a guide to future efforts aimed at assessing the economic impact of smoking bans throughout North Dakota and other states.

ACKNOWLEDGMENTS

This study was commissioned by Fargo Cass Public Health, who received funding through the North Dakota Center for Tobacco Prevention and Control Policy. Tax data were obtained from the North Dakota Office of State Tax Commissioner. For our analysis of the tax data, we drew from two economic studies, *The Economic Impact of Minot's Smoke-free Restaurant Ordinance*, released May 2003, and *The Impact of North Dakota's Smoke-Free Law on Restaurant and Bar Taxable Sales,* released August 2007. Like these studies, we followed Siegel's criteria for judging a quality study.

We wish to thank the bar employees who responded to our survey for their willingness to be a part of this project and help provide insight into the economic condition of their establishments since the implementation of the smoking bans in Fargo and West Fargo. In addition, we wish to thank the research staff at the North Dakota Office of State Tax Commissioner for supplying us with the appropriate tax data.

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Executive Summary

INTRODUCTION

This report was commissioned by Fargo Cass Public Health, who received funding through the North Dakota Center for Tobacco Prevention and Control Policy. The purpose of our study was to assess the economic impact of the smoking bans that went into effect July 1, 2008, on businesses, specifically bars, within Fargo, North Dakota, and West Fargo, North Dakota. We attempted to answer the question, "With the passage of these ordinances, has there been a corresponding negative economic impact on drinking establishments in Fargo and West Fargo?" The reason for this study is to assist policy makers in understanding the economic implications of the recent city comprehensive smoking bans which had the primary goal of improving public health.

In an attempt to address many of the complex issues entailed in an economic impact assessment of a smoking ban upon drinking places, we utilized three key tools for analysis. First, we conducted a horizontal and vertical analysis of the Accommodation and Food Services sector and its subsectors in Fargo, West Fargo, and Grand Forks. We employed horizontal and vertical analysis in order to focus specifically on trends and comparisons between quarterly taxable sales and purchases data over time. The city of Grand Forks, which currently allows smoking in bars, served as a benchmark for the vertical and horizontal analysis. Second, we conducted a regression analysis of the tax data for these industries in Fargo and West Fargo. We used regression analysis to measure the effect of various indicators on changes in quarterly taxable sales and purchases. The value of this approach was that it allowed us to control for the interaction of the various indicators. These first two sections took a macroeconomic approach. Third, we conducted a random survey of bar employees in Fargo and West Fargo to determine perceptions of changes in their establishments in the last two years and to examine perceived economic impacts at the individual establishment level. This allowed us to gain insight into how the comprehensive smoking bans may have affected individual people and businesses.

By analyzing the tax and survey data using objective scientific approaches, we hope to provide policy makers and other key leaders with insight into the impact of such legislation. Moreover, the wisdom gained through the experience of using a triangulated approach for the analysis may serve as a guide to future efforts aimed at assessing the economic impact of smoking bans throughout North Dakota and other states.

KEY FINDINGS

Overall Findings

Our approach was threefold. Section 1 presents our horizontal and vertical analysis. Section 2 presents our regression analysis. Section 3 presents the results of our random survey of bar employees.

Based on our Section 1 analysis of the cities of Fargo and West Fargo, which implemented the comprehensive smoking bans in 2008, and the city of Grand Forks, which operates under the less restrictive 2005 statewide smoke-free law, we can conclude that the city smoking bans had a short-term economic impact (i.e., from Quarter 2 (Q2) 2008 to Q3 2008) on the Drinking Places subsectors in Fargo and West Fargo but did not have long-term economic impacts (i.e., trends returned to normal within the next quarter). Based on the regression analysis in Section 2, we can conclude that the smoking bans had no significant long-term effect upon Fargo and West Fargo's Drinking Places once market share was accounted for, reflecting that competition for bar customers was concurrent with the implementation of the bans. Market share refers to the proportion of Cass County's taxable sales and purchases for Drinking Places attributed to each city.

The survey results in Section 3 show that when viewing all responses in the aggregate, bar employees perceived the changes in their establishment over the past two years to be neutral or positive. However, bar employees from small establishments (i.e., fewer than 20 employees in Fargo or 15 employees in West Fargo) were more likely to perceive that there were significant negative changes in the last two years. Survey results also suggest that resistance from employees in the bar industry has declined, even among those who were most resistant –smokers and those in small establishments. Prior to the bans, smokers were significantly less supportive of the legislation. Now, there is no longer a significant difference in support by smoking status. On average, levels of support for the bans have increased among bar employees.

Therefore, the comprehensive smoking bans appear to be good public policy because they address an important public health issue (see Callinan et al., 2010) and our study has determined that, overall, the bans do not have a long-term negative economic consequence.

Section 1: Horizontal and Vertical Analysis of Tax Data

Methodology

Section 1: Horizontal and Vertical Analysis of Tax Data focuses on data that were obtained from the taxable sales and purchases filed by Restaurants and Drinking Places in Fargo, West Fargo, Grand Forks, and the state of North Dakota, as defined by their NAICS (North American Industry Classification System) codes. This approach closely followed the methodology used in the economic study, *The Impact of North Dakota's Smoke-Free Law on Restaurant and Bar Taxable Sales*, released August 2007. The data for NAICS codes 72 (Accommodation and Food Services sector), 722110 (Full-service Restaurants subsector), 722211 (Limited-service Restaurants subsector), and 722410 (Drinking Places subsector) were obtained from the North Dakota Office of State Tax Commissioner. The taxable sales and purchases information was converted into 2009 dollars using Consumer Pricing Index (CPI) tables for all urban consumers as supplied by the United States Department of Labor. We conducted horizontal and vertical analysis of the tax data. The horizontal analysis looked at changes in a subsector over time and the vertical analysis looked at the relationship of a subsector to the whole.

We chose to analyze the restaurant subsectors because they provided us with two key pieces of information related to Drinking Places. First, since North Dakota passed its smoke-free law in 2005 banning smoking in restaurants, these establishments served as historical baselines of how smoking bans have affected service subsectors in North Dakota. By analyzing the restaurant subsectors, we also gained information on seasonality trends which affect the North Dakota service subsectors and thus were able to examine how these trends correlated with other service subsectors such as Drinking Places.

To control for the differences in the recession's impact on individual cities, such as recessionary impacts on local businesses, we chose to include a benchmark city. For the purposes of our study, Grand Forks served as an ideal benchmark for comparison because it shares similar characteristics as the cities which are the focus of our study. Similarities between Grand Forks, Fargo, and West Fargo include a diverse economy, a large college population, and being located on Interstate 29 in North Dakota's Red River Valley. In addition, the relative proportion that the city of Grand Forks' taxable sales and purchases comprise of Grand Forks County's NAICS subsectors is similar to that which Fargo and West Fargo comprise of Cass County's NAICS subsectors. The city of Grand Forks still allows smoking in bars, which is a key variable of interest to us in our analysis.

Our approach was designed to address Siegel's criteria for a quality study: 1) using objective data, 2) using multiple observation points before and after the legislation was implemented, 3) using statistical methods to control for time trends and random events, and 4) using statistical methods to control for economic trends through the use of comparison areas. We feel confident that the information in our study provides an accurate portrait of the economic impacts of the smoking bans on bars in Fargo and West Fargo.

Results of Horizontal and Vertical Analysis of Tax Data

Using Grand Forks as the benchmark for comparison, we analyzed tax data for Fargo and West Fargo using the same techniques and specifically looked for economic impacts related to bars (i.e., the Drinking Places subsector) which could be directly linked with the passing of the Fargo and West Fargo comprehensive smoking bans.

1. ***Full-service Restaurants* experienced no long-term effects due to the 2005 North Dakota smoke-free law in Fargo or West Fargo.**
    - The taxable sales and purchases from Full-service Restaurants have been increasing in **Fargo** since the fourth quarter of 2004, so we find that long-term growth has occurred after the passing of the North Dakota smoke-free law in the third quarter of 2005.
    - The taxable sales and purchases from Full-service Restaurants have been increasing in **West Fargo** since the fourth quarter of 2004, which shows that long-term growth has occurred after the passing of the North Dakota smoke-free law. However, West Fargo has had the smallest growth in this subsector of the three North Dakota cities we analyzed.
    - The quarter of sharpest decline in taxable sales and purchases in **Fargo** occurred in the first quarter of 2005, which corresponds with Grand Forks' sharpest quarter of decline. This decline does not correspond to the passing of the North Dakota smoke-free law in the third quarter of 2005.
    - The quarter of sharpest decline in taxable sales and purchases in **West Fargo** occurred in a quarter which did not correspond with the passing of the North Dakota smoke-free law nor did it correspond to Fargo or Grand Forks sharpest decline.

2. ***Limited-service Restaurants* experienced no long-term effects due to the 2005 North Dakota smoke-free law in Fargo or West Fargo.**
    - The taxable sales and purchases from Limited-service Restaurants have slightly increased in **Fargo** and in **West Fargo** since the fourth quarter of 2004, so we find that no long-term effects have occurred after the passing of the North Dakota smoke-free law in the third quarter of 2005.

- The quarter of sharpest decline in taxable sales and purchases in **Fargo** occurred in the first quarter of 2005, which corresponds with Grand Forks' sharpest quarter of decline. This decline does not correspond to the passing of the North Dakota smoke-free law.
- In **West Fargo**, once again the quarter of sharpest decline in taxable sales and purchases occurred in a quarter which did not correspond with the passing of the North Dakota smoke-free law, nor did it correspond with the quarter of sharpest decline experienced by Fargo's or Grand Forks' Full-service restaurant subsectors.

3. ***Drinking Places* in Fargo and West Fargo experienced short-term effects due to the comprehensive smoking bans effective July 1, 2008, but experienced no long-term effects. Regular seasonality trends were still observed.**
   - The taxable sales and purchases from Drinking Places have been increasing in **Fargo** since the fourth quarter of 2004 and have remained stable since the third quarter of 2008 when the Fargo and West Fargo smoking bans went into effect.
   - The taxable sales and purchases from Drinking Places have been greatly increasing in **West Fargo** since the fourth quarter of 2004 and have continued growing since the third quarter of 2008 when the Fargo and West Fargo smoking bans went into effect.
   - The quarter of sharpest decline in taxable sales and purchases in **Fargo** occurred in the third quarter of 2008, which corresponds with the passing of the Fargo and West Fargo comprehensive smoking bans. However, there were no long-term visible effects that could not be attributed to regular seasonality trends.
   - The quarter of sharpest decline in taxable sales and purchases in **West Fargo** did not occur in the third quarter of 2008. However there was a significant decline which corresponds with the passing of the Fargo and West Fargo comprehensive smoking bans. There were no long-term visible effects that could not be attributed to regular seasonality trends.

Conclusion

We analyzed objective information for the cities of Grand Forks, Fargo, and West Fargo. We used horizontal and vertical analysis techniques to interpret the data and provide insight into any economic effects that Fargo and West Fargo may have experienced which could be directly linked to the passing of the comprehensive smoking bans effective July 1, 2008. Based on our analysis of the two North Dakota cities impacted by the comprehensive bans and one that was not, we can conclude that the smoking bans had a short-term economic impact on the Drinking Places subsector but did not have long-term economic impacts. Our conclusion is supported by the vast majority of studies which have been conducted throughout the nation which have also concluded that smoking bans have no long-term effects on the taxable sales and purchases.

Therefore, the comprehensive smoking bans appear to be good public policy because they address an important public health issue (see Callinan et al., 2010) and our study has determined that, overall, the bans do not have a long-term negative economic consequence.

Section 2: Regression Analysis of Tax Data

Methodology

In Section 2: Regression Analysis of Tax Data, we analyzed Fargo and West Fargo looking for the effect which our primary variable, the Fargo and West Fargo comprehensive smoking bans, had upon the Drinking Places subsector within these two cities. Section 2 utilizes the taxable sales and purchases data obtained from the North Dakota Office of State Tax Commissioner, as did Section 1. In this section we drew from another Minot economic study, *The Economic Impact of Minot's Smoke-Free Restaurant Ordinance*, released May 2003.

We used regression analysis as another means for analyzing the tax data because it directly met Siegel's third criteria for a quality study. It allows us to measure the effect of one variable on another. Specifically, it measures the effect that the comprehensive smoking bans had on taxable sales and purchases in the Full-service Restaurants, Limited-Service Restaurants, and Drinking Places subsectors.

Our dependent variable was the proportion that the taxable sales and purchases from each of the three subsectors in Fargo or West Fargo contributed to the overall statewide Accommodation and Food Services sector. Our independent variables included quarters (to control for issues of seasonality), time (20 data points represented the annual rate of change in the dependent variable each quarter), and whether the comprehensive smoking bans were in place (0 is no ordinances and 1 is the ordinances). An additional variable was also analyzed representing market share (Fargo's and West Fargo's quarterly share of Cass County's taxable sales and purchases, for each subsector). We tested the models for significance and also for multicolinearity using three tests (inter-correlations, tolerance, and VIF). We concluded that there was no multicolinearity in our regression models, meaning that the independent variables were not too closely correlated, and that the models were significant, meaning the differences we saw were due to more than chance.

Results of Regression Analysis of Tax Data

The regression models showed that the comprehensive smoking bans DID NOT have a significant impact on taxable sales and purchases for Fargo's or West Fargo's *Full-service Restaurants* or *Limited-service Restaurants* relative to the overall statewide Accommodation and Food Services sector. They DID show a significant impact on the proportion of taxable sales and purchases for Fargo's or West Fargo's *Drinking Places*. However, when controlling for market share, the models showed that the ordinances DID NOT have a significant impact. However, regression analysis is not sensitive to the short-term impacts that were detected in the horizontal and vertical analysis noted above.

Conclusion

We used regression analysis techniques in order to provide insight into whether the passing of the comprehensive smoking bans in Fargo and West Fargo had a significant impact upon these cities by analyzing tax data and the following independent variables: quarters, time, whether the ordinances were in place, and market share.

Based on this analysis, we concluded that the smoking bans had no significant long-term effect upon Fargo's and West Fargo's Drinking Places. Our conclusion echoes those formed by the vast majority of studies which have been conducted throughout the nation as well as with the Minot study of the restaurant subsectors, that smoking bans have no significant long-term effects on taxable sales and purchases. The regression analysis confirms our findings from the horizontal and vertical analysis in Section 1, that smoking bans appear to be good public policy because they address important public health issues (see Callinan et al., 2010) and our study has determined that, overall, the bans do not have a long-term negative economic consequence.

Section 3: Survey of Bar Employees

Methodology

In Section 3: Survey of Bar Employees, we conducted a survey of Fargo and West Fargo bar employees to gather non-tax related data, regarding perceived changes that occurred in the last two years in the establishment.

A list of liquor establishments in Fargo and West Fargo was obtained from Fargo-Cass Public Health. We then implemented a stratified sample for this study. Establishments were stratified by city, size (based on number of employees and then segregated into small or large establishments), time of day, and by day of the week. All establishments were randomly selected based on these four stratification criteria.

Staff from the North Dakota State Data Center (NDSDC) met with managers from each of the selected establishments, asked for permission to survey employees, and when possible hand-delivered survey packets to each of the employees on that specific shift. Employees were given a brief explanation of the project and instructed to complete the survey on their own time. The survey packet included the survey, a cover letter, and a postage-paid, self-addressed return envelope. Data collection took place from April 7 – April 30, 2010.

A total of 324 surveys were delivered – 105 to small establishments (i.e., fewer than 20 employees in Fargo or 15 employees in West Fargo) and 219 to large establishments. A total of 38 surveys were returned from small establishments and 51 were returned from large establishments. The overall response rate was 27 percent. This response rate ensures that we can be 90 percent confident the error is no more than 7.5 percent.

Summary

1. Most respondents indicated that there were no changes in their salary and their scheduled number of hours over the past two years.
    - However, approximately half of respondents said there was a decrease in tips.
2. Most respondents said that there were no changes in the quality of product offered, menu offerings, and advertising within their establishments over the past two years.
    - However, nearly half of respondents indicated there was an increase in promotional marketing strategies.
3. The majority of respondents perceived a decline in the total number of patrons over the past two years.

- Respondents perceived the largest losses in patrons to be among working class and regulars.
- The majority of respondents said there was no change among professionals.

4. Similar proportions of respondents perceived a positive and negative impact on their working environment since the comprehensive smoking bans took effect.
5. Respondents are more supportive of the comprehensive smoking bans now than when they took effect on July 1, 2008.
6. The vast majority of respondents reported they were working in their establishment prior to the time the ordinances took effect (July 1, 2008).
7. Most respondents said their main job/title was bartender.
8. Half of respondents said they are a cigarette smoker.

Conclusion

The strength of Section 3 is that the survey uses individuals within establishments to offer insight regarding changes that occurred in the last two years in the establishment. This timeframe corresponds to the comprehensive smoking bans taking effect. It also reflects a recessionary economic period. We did not ask respondents what they think is the cause of changes; we wanted the data to speak to the changes without introducing potential bias based on respondent's perceptions of the cause of those changes. In addition, we do not know if the employees' perceptions match the financial realities of the establishment.

When viewing combined responses from all employees as a whole, survey findings indicate there was very little or no perceived changes in their establishments over the past two years. However, when one looks at the findings by size of establishment, a different story emerges. The data tell us that employees in small establishments did perceive significant negative changes in the past two years.

Survey results also suggest that resistance from employees in the bar industry has declined, even among those who were most resistant – smokers and those in small establishments. Prior to the ordinances, smokers were significantly less supportive of the legislation. Now, there is no longer a significant difference in support by smoking status. On average, levels of support for the ordinances have increased among bar employees.

OVERALL CONCLUSIONS AND RECOMMENDATIONS

There are certain limitations that exist when using tax data. Attempts were made to account for these when possible. Using macro-level data fails to capture what is happening on a smaller scale, so we conducted a survey to gather information from bar employees in order to circumvent this issue. In addition, conducting an economic study during a recession was problematic because there was no means to control for the differences in the recession's impact on individual cities, such as recessionary impacts on local businesses. However, Grand Forks was used as a benchmark in order to attempt to control for this issue. Lastly, measuring long-term economic impact based on limited years of tax data is not ideal; however, analyzing three subsectors, two of which were subject to a previous smoke-free law spanning back nearly five years, provided additional context.

The findings from our Section 1 analysis demonstrate that a short-term economic impact did occur which can be linked with the comprehensive smoking bans passed in Fargo and West Fargo. More importantly, however, the findings from Section 1 and Section 2 concur that there were no significant long-term economic effects on Drinking Places from the passing of the comprehensive smoking bans in Fargo and West Fargo. Our findings from Section 3 aligned with sections 1 and 2. When viewing the responses from all bar employees as a whole, the survey found very little or no perceived changes in their establishments in the last two years. However, Section 3 was also used to measure the effects that the comprehensive smoking bans had upon individual establishments and people. The data suggested that employees in small establishments perceived significant negative changes in their establishment in the last two years.

Our analysis of the tax data shows that the comprehensive smoking bans passed in Fargo and West Fargo did not have a significant long-term economic impact upon the cities. In addition, our survey data indicate that, overall, there was very little or no perceived effect on establishments after the comprehensive smoking bans were implemented. We view these results as opportunities for change in an industry which is concerned about the impact smoking bans may have on their livelihood.

We feel confident with our results since we met all of Siegel's criteria for judging a quality study. In addition, our conclusion is the same as that reached in the 2003 and 2007 Minot studies regarding the lack of long-term economic effects from smoking bans and conclusions reached by the vast majority of smoking ban studies from around the nation (see Scollo et al., 2003).

We offer the following recommendations for consideration.

1. Research should be undertaken to get a better understanding of how smoking bans affect different styles of bars so that individual bars with decreases in sales linked with smoking bans (primarily small bars) can identify changes that may be necessary for them to thrive in the new environment. The key for individual businesses that are struggling is to help them understand and adapt to the new environment.

2. A research effort should be undertaken and data gathered to grasp the economic impact of the recession which began in December 2007 on the state of North Dakota. This information should be provided to communities so that they can use the data to understand the impact of the recession on different sectors in their communities (e.g., the economic impact of the recession on NAICS subsectors such as Drinking Places).

3. Studies similar to this one should be conducted at predetermined intervals in order to further understand long-term economic effects from smoking bans, which may in fact be positive. It would be recommended to revisit this study at 5 and 10 years out from the passing of the smoking bans so that analysis of this information can also be conducted during a non-recessionary period and long after people have adjusted to the change in regulations.

4. Further studies should also be conducted on other variables which can have an impact on Drinking Places such as city population increases/decreases, unemployment rates, market fluctuations, psychological feelings of wealth, etc., so that a better understanding of the complex environment in which Drinking Places operate can be fully understood.

Introduction

BRIEF HISTORY OF SMOKING BANS IN NORTH DAKOTA

Over the past decade the topic of smoking bans has become a heated debate. There are those who believe that banning smoking creates economic woes for businesses and infringes upon the rights of smokers as well as business owners. Conversely, there are those who believe that the health concerns of non-smokers and employees outweigh any impact caused by not allowing individuals to smoke indoors. This debate is not new to the state of North Dakota. North Dakota banned the sale of cigarettes in 1895; by 1920, 14 other states had also banned the sale of cigarettes. All of these laws were repealed by 1927 (Trex, 2010). After the repeal of these bans, the smoking ban issue would remain dormant in North Dakota for a number of years.

In January 2002, the city of Minot was one of the first cities in North Dakota to implement a smoke-free restaurant ordinance. In May 2003, Minot followed up the passing of the smoke-free ordinance with a study of the economic impact of the smoke-free ordinance. That study found no adverse change in restaurant sales because of the smoke-free ordinance and these conclusions supported earlier findings from other economic impact studies such as those in Colorado and California.

On August 1, 2005 North Dakota's smoke-free law went into effect, which prohibited smoking in all enclosed areas of public places of employment with some exceptions, primarily bars and truck stops. By the late 2000s, these smoking bans were becoming even more stringent in a few North Dakota locations. On June 10, 2008, the cities of Fargo and West Fargo passed comprehensive smoking bans. While it was only an advisory ballot in West Fargo, it was adopted by the city commission at their next meeting. Both city bans became effective on July 1, 2008.

The two largest state university campuses in North Dakota both passed their own smoking bans on campus grounds. The University of North Dakota banned smoking anywhere on campus grounds on October 5, 2007. North Dakota State University began by banning smoking outdoors on campus within 50 feet of buildings in 2008. In December 2009, the University Senate approved a campus smoking ban with a vote of 35-24, which banned smoking anywhere on campus grounds beginning on March 1, 2010 (*NDSU President Dick Hanson signs campus no-smoking policy*, Winter 2010).

PROJECT PURPOSE AND BACKGROUND

This report was commissioned by Fargo Cass Public Health, who received funding through the North Dakota Center for Tobacco Prevention and Control Policy. This center was created as a result of Measure 3 which was passed by voters in November 2008 and requires that a portion of tobacco settlement dollars be used to fund a comprehensive statewide tobacco prevention and control program to significantly reduce tobacco use.

The purpose of our study is to assess the economic impact of the smoking bans on businesses, specifically bars, within Fargo and West Fargo, by examining the Drinking Places subsector as a whole. The issue of the impact of smoking bans is controversial and highly debated. The literature is evolving with regard to scientific data that address economic impacts. However, many of the earlier studies of the economic impact of smoking bans on bars and restaurants were found to have important limitations. For example, most traditional studies use taxable sales and purchases data to assess the impact of an ordinance. Unfortunately, the major limitation with this approach is the restrictions that occur with aggregate data. For example, aggregate data does not provide insight into potential impacts of individual firms. One of the common complaints of this approach is that smaller firms have their impact masked by the much larger firms since aggregate taxable sales and purchases data cannot be disaggregated by size of firm. The best remedy for this shortcoming is to augment aggregate data with survey data that explores impact on individual firms. We incorporated this methodological approach in our study. Thus, we used both traditional aggregate taxable sales and purchases data along with a random survey of employees in individual bars.

A second limitation of traditional studies is that they frequently lack comparative context. One of the best ways to address this limitation is through control group analyses. In this approach, the communities under study are matched with similar communities that are not subject to the same ordinances under investigation. We also incorporated this technique in our analysis by including the city of Grand Forks, which did not have a comprehensive smoking ban in bars at the time this study was conducted.

A third limitation of traditional studies is their inability to examine changes in costs that firms may implement in reaction to the impact of an ordinance. Owners may overcome losses through various strategies which include lowering product quality, advertising, lowering the wages of staff, and changing promotional or marketing strategies. The impact of changes in costs cannot be easily distinguished in taxable sales and purchases data. Therefore one could easily misinterpret stable or modest increases in taxable sales and purchases data as indicating an increase in revenue after the ordinance had passed, when in reality aggressive changes in costs by management may have caused decreases or increases in revenue due to the higher or lower costs needed to maintain or increase the number of customers. We also addressed this concern in our study through our random sample of employees in bar establishments. We specifically asked respondents to indicate what types of changes were implemented in their establishment that could affect revenue streams.

Finally, a limitation that we could not address in our current approach was whether sufficient time had passed to determine if the ordinance may have had some unexpected consequences. The most effective approach to answering this question is to use time series analysis. However, this approach requires a much longer time period after the implementation of the ordinances than is currently possible. This suggests, however, the need for further investigation of the potential impact of the Fargo and West Fargo comprehensive smoking bans at further intervals. Nonetheless, we feel we have addressed the major limitations noted in the literature regarding approaches to examining the economic impact of a smoking ordinance. Therefore, we are confident that our analysis will offer policy makers and key leaders the necessary insight into the economic impact of the 2008 Fargo and West Fargo comprehensive smoking bans to render judgment on the value of the policy from an economic perspective. In addition, we hope our approach may also serve as a guide for future efforts aimed at assessing the economic impact of smoking bans throughout North Dakota and many other states.

DESCRIPTION OF ANALYTICAL APPROACH

In an attempt to address many of the complex issues entailed in an economic impact assessment of a smoking ban upon drinking places, we utilized three key tools for analysis. First, we conducted a horizontal and vertical analysis of the Accommodation and Food Services sector and its subsectors in Fargo, West Fargo, and Grand Forks. We employed horizontal and vertical analysis in order to focus specifically on trends and comparisons between quarterly taxable sales and purchases data over time. The horizontal analysis looked at changes in a subsector over time and the vertical analysis looked at the relationship of a subsector to the whole. The city of Grand Forks, which currently allows smoking in bars, served as a benchmark for the vertical and horizontal analysis. Second, we conducted a regression analysis of the tax data for these industries in Fargo and West Fargo. We used regression analysis to measure the effect of various indicators on changes in quarterly taxable sales and purchases. The value of this approach was that it allowed us to control for the interaction of the various indicators. These first two sections took a macroeconomic approach. Third, we conducted a random survey of bar employees in Fargo and West Fargo to determine perceptions of changes in their establishments in the last two years and to examine perceived economic impacts at the individual establishment level. This allowed us to gain insight into how the comprehensive smoking bans may have affected individual people and businesses.

By analyzing the tax and survey data using objective scientific approaches, we hope to provide policy makers and other key leaders with insight into the impact of such legislation. Moreover, the wisdom gained through the experience of using a triangulated approach for the analysis may serve as a guide to future efforts aimed at assessing the economic impact of smoking bans throughout North Dakota and other states.

Section 1: Horizontal and Vertical Analysis of Tax Data

METHODOLOGY

For our study, we drew from the economic study, *The Impact of North Dakota's Smoke-Free Law on Restaurant and Bar Taxable Sales*, released August 2007. Like that study, we followed Siegel's criteria for judging a quality study.

Siegel's Criteria for Judging Quality Studies

1. Use of Objective Data – Objective data are observations that do not involve personal feelings and are based on observable facts. Objective data can be measured quantitatively or qualitatively. Objective data used in this study consisted of tax records obtained from North Dakota's Office of State Tax Commissioner for Fargo, West Fargo, Grand Forks, Cass County, Grand Forks County, and North Dakota. The tax records used in this study consisted of the following types of data (see www.nd.gov/tax/salesanduse/pubs):

    - **Taxable Sales** consist of gross sales less nontaxable sales. Businesses must remit sales tax on taxable sales.
    - **Taxable Purchases** consist of taxable goods purchased by businesses for their own use on which they did not pay sales tax to suppliers. Also included are purchases of goods by businesses to be installed into real property by contractors who did not pay sales tax to suppliers. Businesses and contractors must pay use tax on these goods. Businesses and individuals purchasing items over the Internet on which sales tax is not charged are obligated to report "taxable purchases" and remit the appropriate use tax.

2. Use of multiple observation points before and after the legislation was implemented – Data were available from 2002 through 2009 for the cities of Fargo, West Fargo, and Grand Forks. However, for the state of North Dakota, these same records were only available from the end of 2004 through 2009 due to a change in North Dakota from using Standard Industrial Classification (SIC) codes to using North American Industry Classification System (NAICS) codes during this timeframe. All city and county tax data used in this study were recorded under their NAICS code sectors.

3. Use of statistical methods, such as regression analysis, that control for time trends and random events – In order to control for seasonal skewing of the data in Section 1, all tax data were recorded by year and quarter so that data could be analyzed by annual changes as well as any changes that occur on a regular basis due to seasonal cyclical events. An example of a seasonal cyclical event is increased spending during the fourth quarter annually for events such as Christmas and a downturn during the first quarter annually due to recovering from cash outflows during the previous quarter for events such as Christmas. To understand these time trends and monitor for random events, we implemented the use of horizontal and vertical analysis to compare percentage changes annually and quarterly, and compare the proportions of North Dakota's total taxable sales and purchases for specific NAICS codes over time.

- **Horizontal Analysis –** This type of analysis focuses on trends and changes in financial statements over time, such as annual, quarterly, or monthly changes. Along with the dollar and percentage changes, horizontal analysis helps us to see relative changes over time and identify positive and negative trends. In the case of our study, we looked for changes in quarterly trends in order to get a better understanding of how the different seasons affect the various service subsectors in North Dakota and to identify any anomalies outside of regular seasonality trends (Putra, 2009).

- **Vertical Analysis –** This type of analysis focuses on comparing each separate category on a financial statement to one specific category on a financial statement. In order to accurately record a correlation between the categories, all comparisons between categories must be within the same accounting period, whether annually, quarterly, or monthly. To find trends using vertical analysis techniques, the analyses of several periods in relation to one another must be compared and thus annual, seasonal, or monthly trends may be revealed. In our study, we compared three separate service subsectors to the overall sector in which they contributed taxable sales and purchases. We did this to find the percentage of contributions they comprised from quarter to quarter in order to once again identify any anomalies outside of regular seasonality trends (Bushman, 2007).

4. <u>Use of statistical methods that control for economic trends through the use of comparison areas</u> – Macroeconomic trends are trends that affect a large part of the economy, such as unemployment rates, inflation rates, recessions, or state wide trends. Two methods were used to control for macroeconomic trends: 1) standardizing the tax data through the use of the Consumer Price Index (CPI) and 2) using a comparison city not subject to the ordinances under investigation. Grand Forks was selected as the comparison city because it has similar characteristics to Fargo and West Fargo. By comparing cities which share similar characteristics, we would expect to find similar economic trends occurring in the comparison city relative to the cities we were analyzing if there is no measurable impact from the ordinances.

In order to fully analyze the information, two primary issues needed to be addressed since the amount of information was so diverse and immense. First, it was important to segregate the information so that only data pertaining to the bar industry and not other industries unrelated to the smoking bans would be analyzed. Second, issues such as the impact of inflation upon our data needed to be controlled so that increases in taxable sales and purchases could be viewed as the result of increased sales, rather than an increase in the cost of goods.

Segregation Methodology

In order to segregate the tax data for analysis purposes, we chose to follow the guidelines of *The Impact of North Dakota's Smoke-Free Law on Restaurant and Bar Taxable Sales* 2007 study. While we made some methodological adjustments, the key in both studies for segregating the data to be analyzed was the use of NAICS codes. We analyzed NAICS codes from the Restaurant subsectors because these would provide us with two key pieces of information related to Drinking Places. First, because North Dakota passed its smoke-free law in 2005 which banned smoking in these establishments, these Restaurant subsectors serve as historical references of how smoking bans have affected other service subsectors in North Dakota. Second, the analysis of the Restaurant subsectors served as a verification of seasonality trends we find in the service subsectors and thus we could correlate these trends with trends we found within the Drinking Places subsector when using the horizontal and vertical analysis techniques.

The study is centered largely on data that were obtained from the North Dakota Office of State Tax Commissioner regarding the taxable sales and purchases filed by establishments in the Restaurant and Drinking Places subsectors in Fargo, West Fargo, Grand Forks, Cass County, Grand Forks County, and the state of North Dakota, as defined by their 2002 NAICS (North American Industry Classification System) codes (i.e., codes 72, 722110, 722211, and 722410). For the cities and counties, this information was available from the first quarter of 2002 through the third quarter of 2009. This information was available for North Dakota on an annual basis from 1998 through 2008 and on a quarterly basis from the first quarter of 1999 through the third quarter of 2009. However, this information was only available at the state level using the same NAICS codes as the cities and counties from the fourth quarter of 2004 through the third quarter of 2009. The discrepancy regarding state records occurred due to a change in the state's classification system from 1987 SIC (Standard Industrial Classification Manual) codes to 2002 NAICS codes. We were unable to convert the statewide information prior to Q4 2004 to its NAICS code counterparts without the specific SIC codes which were used to create the North Dakota industrial sectors listed. Since these SIC codes were not available at the time of our study, we were unable to use any statewide information prior to Q4 2004. Thus, much of our analysis of the cities and counties excludes data prior to Q4 2004.

North American Industry Classification System (NAICS) Codes: Since 1997, when they replaced SIC codes, NAICS codes have been the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. The NAICS codes were formed jointly by the U.S., Canada, and Mexico and serve as a means of allowing a high level of comparability in business statistics among the North American countries (see www.census.gov/eos/www/naics/index.html).

NAICS codes consist of 20 primary sectors; however, only the following primary sector and three of its subsectors were used in our study.

- **NAICS code 72: Accommodation and Food Services**
  - This sector comprises establishments providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption. The sector includes both accommodation and food services establishments because the two activities are often combined at the same establishment.
  - Excluded from this sector are civic and social organizations, amusement and recreation parks, theaters, and other recreation or entertainment facilities providing food and beverage services.

- **NAICS code 722110: Full-service Restaurants**
  - This subsector comprises establishments primarily engaged in providing food services to patrons who order and are served while seated (i.e., waiter/waitress service) and pay after eating. These establishments may provide this type of food service to patrons in combination with selling alcoholic beverages, providing carry-out services, or presenting live nontheatrical entertainment.

- **NAICS code 722211: Limited-service Restaurants**
  - This subsector comprises establishments primarily engaged in providing food services (except snack and nonalcoholic beverage bars) where patrons generally order or select items and pay before eating. Food and drink may be consumed on premises, taken out,

or delivered to the customer's location. Some establishments in this industry may provide these food services in combination with selling alcoholic beverages.

- **NAICS code 722410: Drinking Places – Alcoholic Beverages**
    - This industry subsector comprises establishments known as bars, taverns, nightclubs, or other drinking places primarily engaged in preparing and serving alcoholic beverages for immediate consumption. These establishments may also provide limited food services.

In the 2007 Minot study, *The Impact of North Dakota's Smoke-Free Law on Restaurant and Bar Taxable Sales*, the authors chose to use NAICS code 44-45 as their primary sector. The Minot study analyzed data primarily by comparing specific NAICS code subsectors, namely NAICS 722110 (Full-service Restaurants), 722211 (Limited-service Restaurants), and 722410 (Drinking Places – Alcoholic Beverages) as a percentage of NAICS 44-45 (Retail Trade sector). Our study departed from this approach in that we used the same NAICS subsectors, but measured them instead as a percentage of the overall NAICS 72 (Accommodation and Food Services sector) in which they resided.

- **NAICS code 44-45: Retail Trade**
    - This sector comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.
    - The retailing process is the final step in the distribution of merchandise; retailers are, therefore, organized to sell merchandise in small quantities to the general public. This sector comprises two main types of retailers: store and non-store retailers.

Control for Inflation

The taxable sales and purchase information obtained from the State Tax Commissioner was converted into 2009 dollars using Consumer Pricing Index (CPI) tables for all urban consumers as supplied by the United States Department of Labor. We chose to convert all taxable sales and purchase data obtained into 2009 dollars because it would allow us to compare information over an extended period of time without the data being skewed by dollar value and it would allow readers to view all information at the same baseline, 2009 dollars.

An example of how percentages can be skewed if values are not put in the same baseline can be seen by comparing the taxable sales and purchases for Cass County's Drinking Places (NAICS 722410) from Q1 2002 to Q3 2009. In Q1 2002, Cass County reported $4,571,560 in taxable sales and purchases and in Q3 2009 Cass County reported $9,250,594 in taxable sales and purchases. This equals an increase of just over 100 percent during this time period, which is equivalent to selling twice as many drinks as previously sold.

However, if we index for inflation, we find that Cass County would have $5,451,744 in taxable sales and purchases in Q1 2002, which means that taxable sales and purchases for Drinking Places actually increased 69.68 percent not 102.35 percent.

The use of Siegel's criteria for a quality study provides us confidence that the information derived from the study will be an accurate portrayal of the economic impacts of the smoking bans on Fargo's and West Fargo's bars.

Reasoning for Change from 2007 Minot Study's Methodology

As noted previously, one major change was made between this study and the 2007 Minot study, *The Impact of North Dakota's Smoke-Free Law on Restaurant and Bar Taxable Sales*, which was using NAICS code 72 for the vertical analysis. We replaced NAICS code 44-45 (Retail Trade) with NAICS code 72 (Accommodation and Food Services) for the vertical analysis because we feel it provides a more direct measurement of the portion of taxable sales and purchases contributed by the cities we analyzed to the entire North Dakota Accommodation and Food Services sector. By changing the NAICS code sector used in the vertical analysis, we were also able to form a more accurate analysis of how taxable sales and purchases fluctuate in the service sector and how this sector is affected seasonally. We came to this conclusion by analyzing taxable sales and purchases in the city of Grand Forks. We selected this city because of its similarities with Fargo and West Fargo. Equally important, it was not subject to a comprehensive smoking ban in bars, thus it served as an appropriate comparison or benchmark city from which to draw conclusions. Figure 1 and Figure 2 are comparisons of how using NAICS code 72 more accurately reflects trends in the service industry than by using NAICS 44-45 codes.

Figure 1 presents information that leads us to the following conclusion. The percentage of North Dakota's Retail Trade taxable sales and purchases made up by the city of Grand Forks fluctuates greatly by seasonal trends. We can see that the city of Grand Forks makes up a larger portion of the state's retail trade sector in the first quarter of every year and that the city makes up a smaller portion of this sector in the fourth quarter of every year. Based on this information, we can make one of two assumptions – either the amount of taxable sales and purchases provided by the city of Grand Forks Drinking Places subsector fluctuates greatly by quarter or the amount of taxable sales and purchases from North Dakota's Retail Trade sector fluctuates greatly by quarter.

Compared to Figure 1, the information using North Dakota's Accommodation and Food Services taxable sales and purchases presented in Figure 2 leads to a few different conclusions. While we still find seasonal trends in the data, we now find that the valleys in the chart are consistently in Q3 rather than Q4. However, we find that both charts align in demonstrating that the city of Grand Forks contributes the highest proportion of the state's taxable sales and purchases in Q1, regardless of which of the two sectors is used for vertical analysis. From examining Figures 1 and 2, we can feel confident that the city of Grand Forks contributes the majority of its taxable sales and purchases from Drinking Places in the first quarter. However, until further analyzed we can only make assumptions as to why this trend exists. One possibility is a greater decrease in spending in other service subsectors in comparison to Drinking Places during the first quarter of the year.

Figure 1. Taxable Sales and Purchases of Grand Forks' Drinking Places (722410) as a Percentage of Taxable Sales and Purchases of North Dakota's *Retail Trade* Sector (44-45), Q4 2004 – Q3 2009

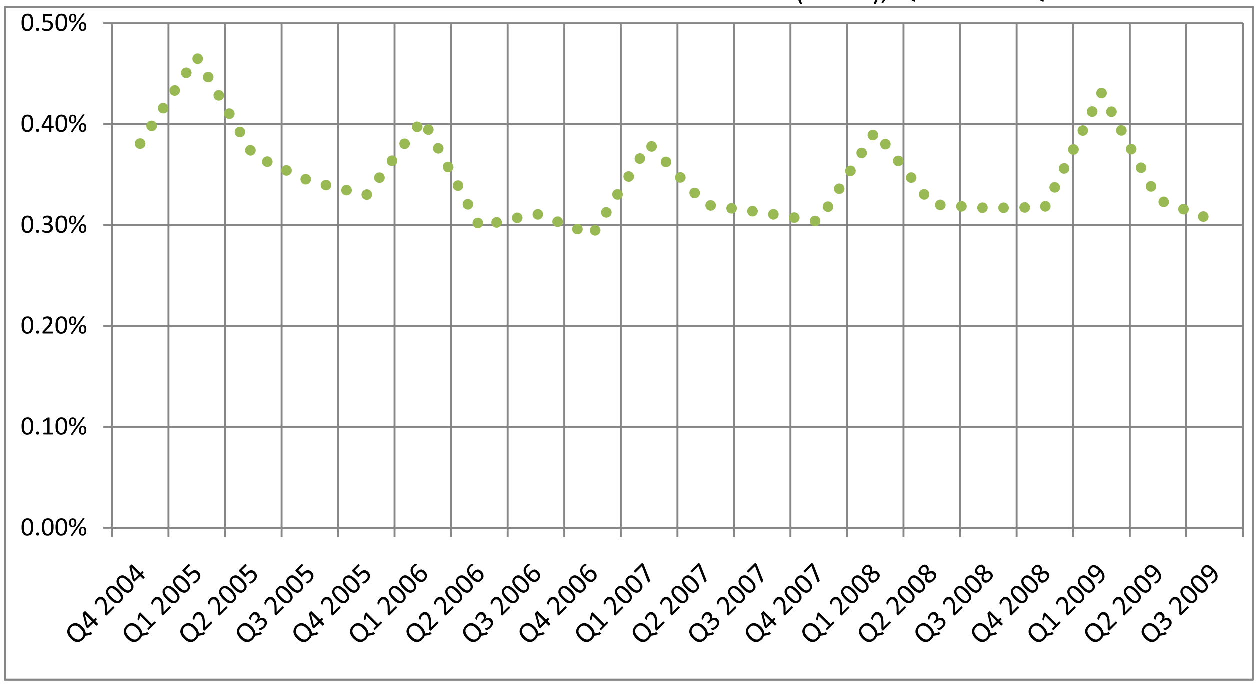
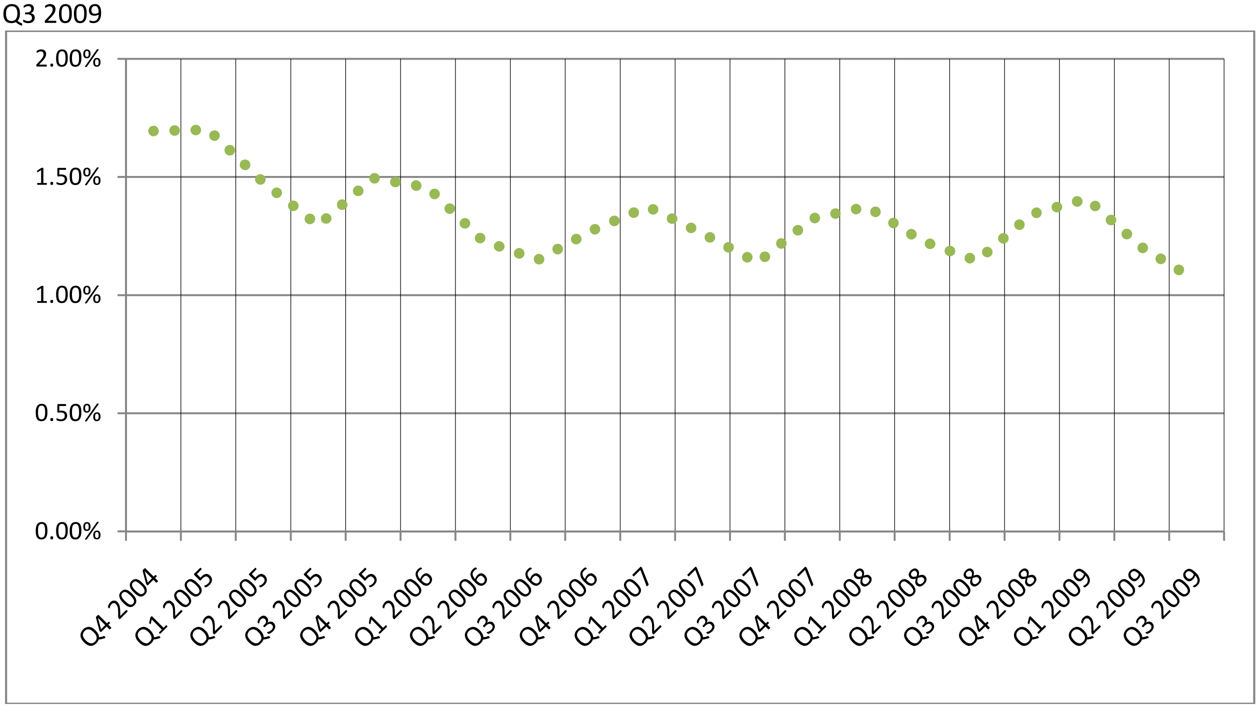
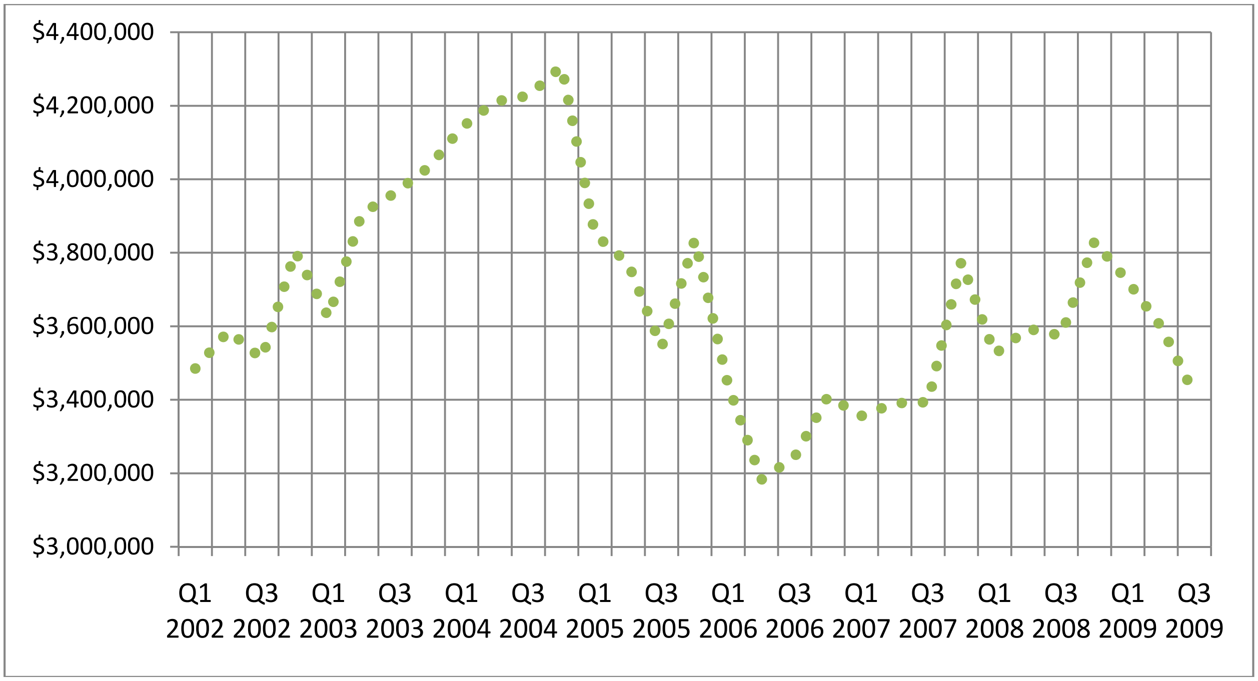


Figure 2. Taxable Sales and Purchases of Grand Forks' Drinking Places (722410) as a Percentage of Taxable Sales and Purchases of North Dakota's *Accommodation and Food Services* Sector (72), Q4 2004 – Q3 2009



In order to determine which vertical sector analysis was more accurate in its peaks and valleys, one final chart needs to be added. Figure 3 shows taxable sales and purchases in dollars rather than percentages for the city of Grand Forks over our study period. Figure 3 demonstrates two consistent trends: 1) taxable sales and purchases peak in the fourth quarter annually and 2) the lowest point most frequently occurs annually in the first quarter.

Figure 3. Grand Forks' Drinking Places (722410) Taxable Sales and Purchases in 2009 Dollars, Q1 2002 – Q3 2009



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the survey period in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader.

Figures 1 through 3 helped us determine which sector is better suited for vertical analysis in our study. For example, by using NAICS code 44-45 for the vertical analysis, we found the fourth quarter to be the lowest point for taxable sales and purchases contributions of Drinking Places for the city of Grand Forks in our study period; however, this is actually the quarter where Grand Forks had the most taxable sales and purchases for Drinking Places. Thus, we can conclude that these low points are caused not by fluctuations in Grand Forks taxable sales and purchases, but by fluctuations in the retail trade sector due to events such as holiday gift shopping.

We also found that the first quarter is not the highest level of taxable sales and purchases for Drinking Places in Grand Forks, but actually consistently the lowest level annually during the period from Q1 2002 – Q3 2009. Thus, we can conclude that the peaks we find in the first quarter on Figure 1 and 2 are caused by larger decreases in spending in other service subsectors. Even though the first quarter is the lowest quarter for taxable sales and purchases for Drinking Places, the Drinking Places subsector is actually contributing its highest proportion to North Dakota's Retail Trade sector and Accommodation and Food Services sector during this quarter in comparison to the other Accommodation and Food Services subsectors.

By using the information from these three charts combined, we came to the conclusion that the use of NAICS code 72 (Accommodation and Food Services sector) was a better match for the vertical analysis used in our study because NAICS code 44-45 (Retail Trade sector) less accurately reflected what was actually happening in the Drinking Places subsector.

Figure 3 used all Drinking Places data available (i.e., Q1 2002 through Q3 2009) in order to determine that the first quarter was consistently the most frequent low point for taxable sales and purchases for the Drinking Places subsector in the city of Grand Forks. All further analysis will only use data provided from Q4 2004 through Q3 2009 because this information is the most relevant for our study. This timeframe correlates with the conversion of North Dakota data using 2002 NAICS codes rather than the previously used SIC codes. This timeframe also includes not only the time period including the Fargo and West Fargo comprehensive smoking bans (effective July 1, 2008) but the North Dakota smoke-free law as well (effective August 1, 2005).

HORIZONTAL AND VERTICAL ANALYSIS OF TAX DATA

As mentioned in the methodology section we used horizontal and vertical analysis techniques in order to analyze Fargo, West Fargo, and Grand Forks in Section 1. We began by analyzing Grand Forks, since it served as our comparison benchmark, and then compared Fargo's and West Fargo's results to Grand Forks and looked for any significant changes from our benchmark. When the direction of significant changes differed in Fargo or West Fargo in comparison to Grand Forks, we noted the amount of change and the time of occurrence in order to correlate these changes with the passing of the North Dakota smoke-free law or the Fargo and West Fargo comprehensive smoking bans. If significant changes only occurred in one quarter they were considered short-term economic impacts. If changes continued over a number of years they were considered long-term economic impacts.

Grand Forks

Grand Forks as a Benchmark

Grand Forks is a city with a diverse economy and a large college population that lies on Interstate 29 in the Red River Valley of North Dakota. While Grand Forks has a complete smoking ban on the University of North Dakota campus, the city and county overall currently only enforce the statewide smoke-free law which prohibits smoking in all enclosed areas of public places of employment with some exceptions, primarily bars and truck stops. Thus, Grand Forks served as an excellent benchmark for this economic impact study for it provided us with a city for comparative purposes, which shares many of the same aspects as the cities which are the focus of our study. Table 1 provides the taxable sales and purchases contributed by the city of Grand Forks as a proportion of the taxable sales and purchases of Grand Forks County.

Table 1. Average Percentage of Grand Forks County's Taxable Sales and Purchases Contributed by the City of Grand Forks, Q1 2002 – Q3 2009

NAICS Subsector (Subsector Code)	Average Percentage Contributed by the City of Grand Forks*
Full-service Restaurants (722110)	98.30
Limited-service Restaurants (722211)	96.44
Drinking Places (722410)	84.55

*The average percentage rate was calculated by averaging the quarterly proportion of taxable sales and purchases that the city of Grand Forks contributed to Grand Forks County from Q1 2002 through Q3 2009.

While Fargo and West Fargo combined have a larger population than the city of Grand Forks, the two cities combined contribute nearly the same proportion of taxable sales and purchases for Cass County as we observed the city of Grand Forks contributing for Grand Forks County's taxable sales and purchases. This makes Grand Forks an ideal candidate for a comparison benchmark on the economic effects of the Fargo and West Fargo smoking bans. Table 2 provides the taxable sales and purchases contributed by the cities of Fargo and West Fargo as a proportion of the taxable sales and purchases of Cass County.

Table 2. Average Percentage of Cass County's Taxable Sales and Purchases Contributed by the Cities of Fargo and West Fargo, Q1 2002 – Q3 2009

NAICS Subsector (Subsector Code)	Average Percentage Contributed by the Cities of Fargo and West Fargo*
Full-service Restaurants (722110)	97.64
Limited-service Restaurants (722211)	98.10
Drinking Places (722410)	86.72

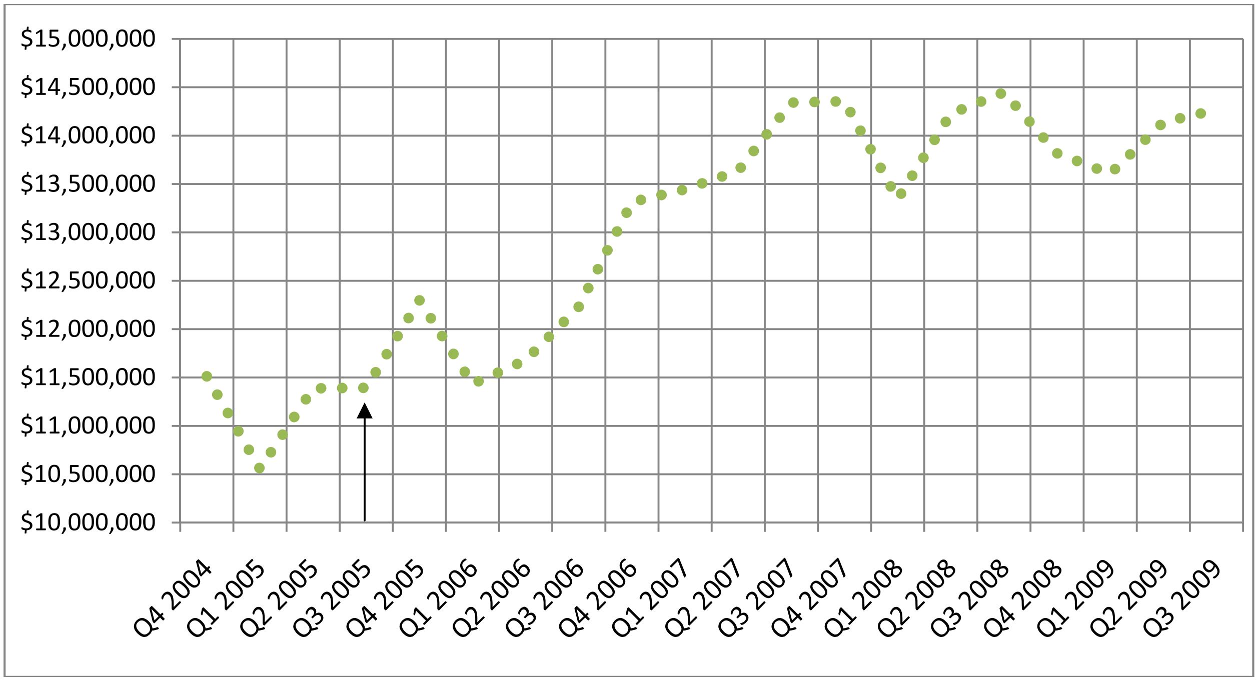
*The average percentage rate was calculated by averaging the quarterly proportion of taxable sales and purchases that the cities of Fargo and West Fargo contributed to Cass County from Q1 2002 through Q3 2009.

As noted previously, our study focused on the analysis of three NAICS code subsectors: Full-service Restaurants (722110), Limited-service Restaurants (722211), and Drinking Places (722410). We compared these subsectors to the overall NAICS code sector in which they resided (i.e., Sector 72 Accommodation and Food Services). Our primary interest was to detect quarterly changes and seasonality trends which existed in the taxable sales and purchases related to these service subsectors.

Full-service Restaurants (722110)

Establishments are allowed to choose the NAICS code in which their organization is associated. However, we can safely assume that establishments listed under NAICS code 722110 are primarily engaged in providing food services to patrons who order and are served while seated and pay after eating. Analysis of this subsector begins by taking a look at seasonality trends in taxable sales and purchases. Figure 4 shows the seasonality trends of Full-service Restaurants in the city of Grand Forks from the fourth quarter of 2004 through the third quarter of 2009.

Figure 4. Grand Forks' Full-service Restaurants (722110) Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

As we can see from Figure 4, the city of Grand Forks has had a steady increase in its taxable sales and purchases from its Full-service Restaurants subsector. Table 3 summarizes the greatest quarterly decrease in taxable sales and purchases for Full-service Restaurants and the percentage change in taxable sales and purchases which occurred in this subsector in our overall study period from Q4 2004 through Q3 2009.

In relation to the impact of the North Dakota smoke-free law, we find that Grand Forks did not have its greatest decline in taxable sales and purchases from its Full-service Restaurants in the quarter corresponding with the implementation of the smoke-free law. We also find that taxable sales and purchases in Grand Forks have increased by 23.94 percent from Q4 2004 through Q3 2009. We can make two conclusions based on this information: 1) the statewide smoke-free law had no noticeable short-term economic impact on Full-service Restaurants in Grand Forks and 2) the smoke-free law had no detrimental effects on Grand Forks' long-term taxable sales and purchases from Full-service Restaurants.

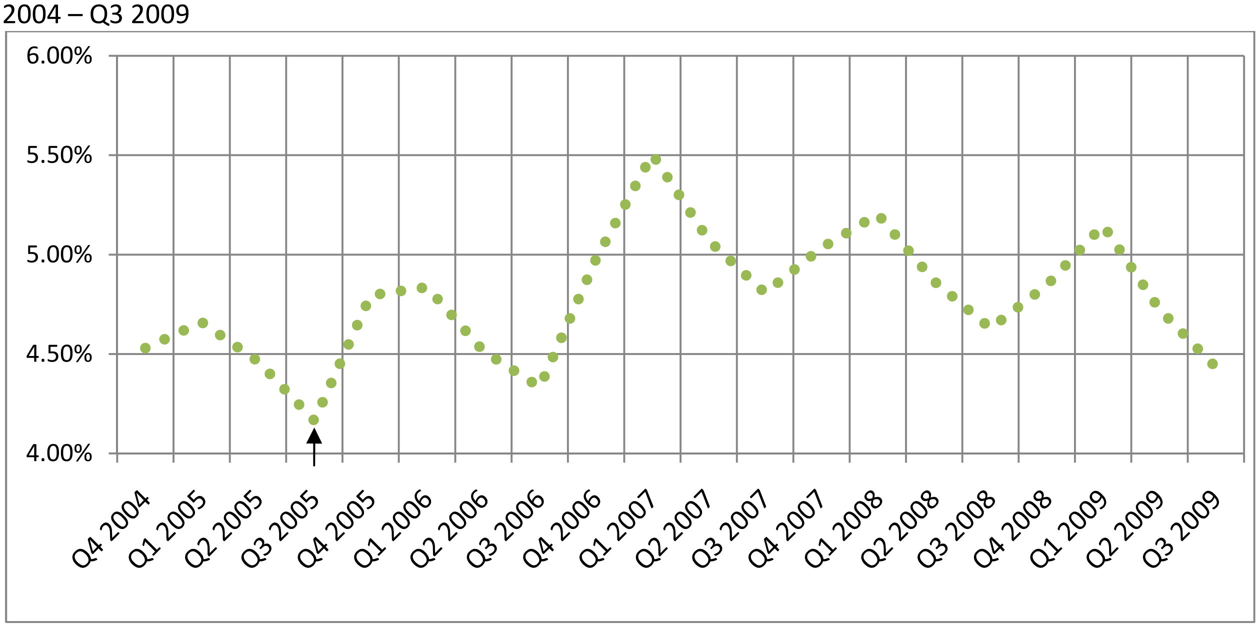
Table 3. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Full-service Restaurants (722110) in Grand Forks, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)	Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009
Full-service Restaurants (722110)	Q4 2004 – Q1 2005 -8.32%	23.94%

To confirm these conclusions, we need to use vertical analysis procedures for comparison of quarterly contributions of Grand Forks Full-service Restaurants. Figure 5 shows the contributions provided by the city of Grand Forks Full-service Restaurants as a percentage of the taxable sales and purchases of North Dakota's Accommodation and Food Services sector (72).

Figure 5 shows seemingly large fluctuations in the contribution of Grand Fork's Full-service Restaurants to the overall state's Accommodation and Food Services sector. This is largely due to the scaling of the graph because Grand Forks has never contributed more than 5.50 percent (see Q1 2007) and no less than 4.16 percent (see Q3 2005) of North Dakota's Accommodation and Food Services sector. This amounts to an overall difference of only 1.34 percent. Thus, this figure illustrates that the city of Grand Forks' contributions as a percentage of North Dakota's taxable sales and purchases in sector 72 have not fluctuated greatly from the end of 2004 through the third quarter of 2009. Any effects in this subsector appear to be occurring on a macroeconomic scale in relation to the sector as a whole, because as Grand Forks' taxable sales and purchases have increased, its overall contributions have not altered greatly. Thus, we know the rate of increase in taxable sales and purchases between Grand Forks' Full-service Restaurants and North Dakota's Accommodation and Food Services sector has been relatively the same.

Figure 5. Taxable Sales and Purchases of Grand Forks' Full-service Restaurants (722110) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009

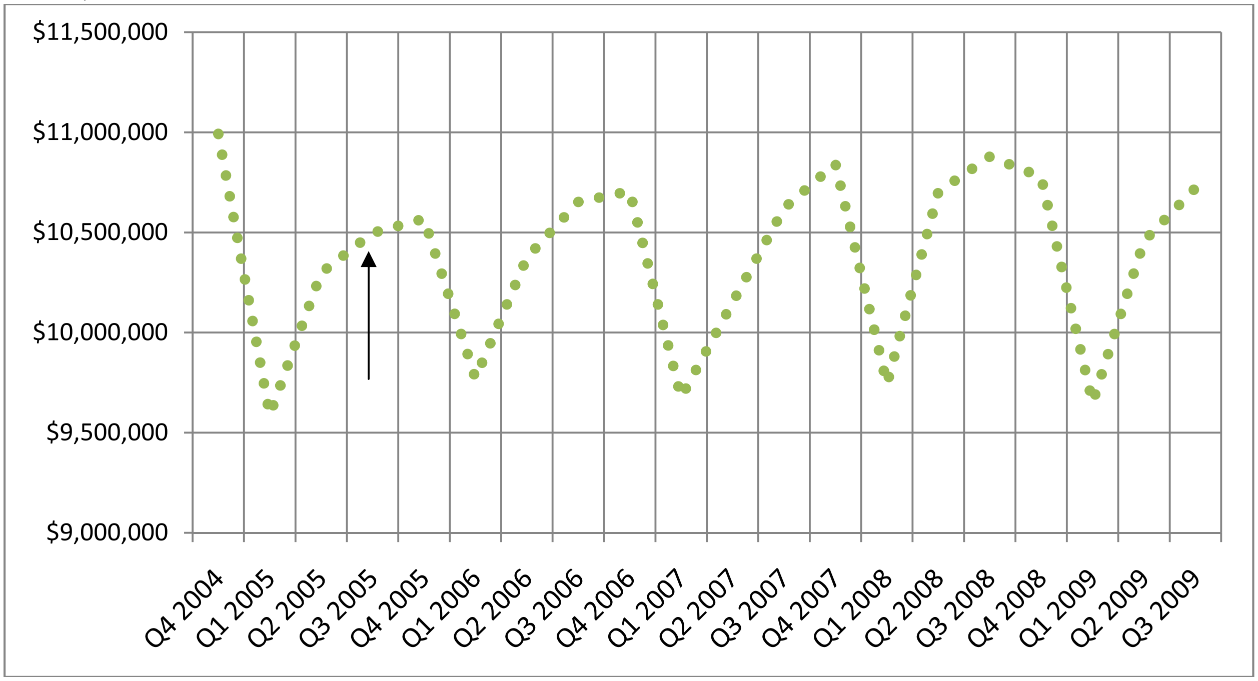


Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Limited-service Restaurants (722211)

Establishments listed under NAICS code (722211) are primarily engaged in providing food services where patrons generally order or select items and pay before eating and exclude snack and nonalcoholic beverage bars. To analyze this subsector, we began by looking at seasonality trends in taxable sales and purchases of Limited-service Restaurants in the city of Grand Forks from the fourth quarter of 2004 through the third quarter of 2009 (see Figure 6).

Figure 6. Grand Forks' Limited-service Restaurants (722211) Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

As we can see from Figure 6, the city of Grand Forks has remained fairly steady in its taxable sales and purchases for Limited-service Restaurants from Q4 2004 through Q3 2009. The wide fluctuations demonstrate a consistent trend in seasonality within the Limited-service Restaurants subsector. Table 4 summarizes the greatest quarterly decrease in taxable sales and purchases for Limited-service Restaurants and the percentage change in taxable sales and purchases which occurred in this subsector in our overall study period from Q4 2004 through Q3 2009.

In relation to the North Dakota smoke-free law, we find that Grand Forks did not have its greatest decline in taxable sales and purchases from Limited-service Restaurants in the quarter corresponding with the smoke-free law. We also find that taxable sales and purchases in Grand Forks from Limited-service Restaurants have decreased by 2.46 percent from Q4 2004 through Q3 2009. We can draw two conclusions based on this information: 1) the smoke-free law did not have a short-term economic impact on Limited-service Restaurants in Grand Forks and 2) the smoke-free law had no long-term detrimental effects on Grand Forks' taxable sales and purchases from Limited-service Restaurants. The slight overall decline is likely due to various seasonality factors.

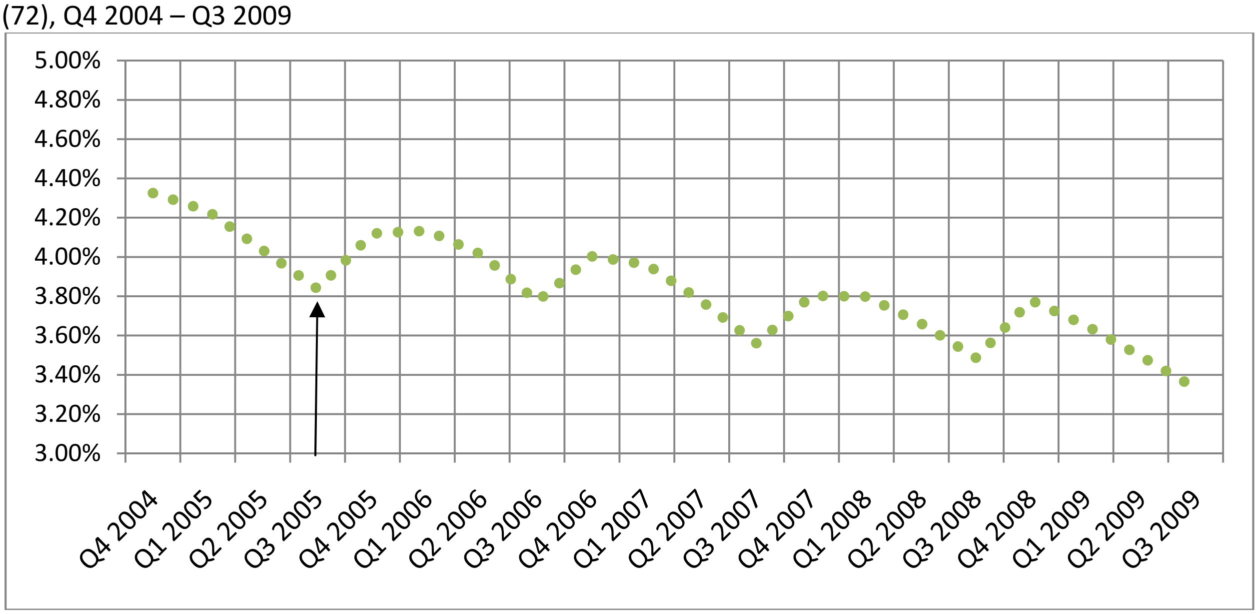
Table 4. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases, for Limited-service Restaurants (722211) in Grand Forks, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)	Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009
Limited-service Restaurants (722211)	Q4 2004 – Q1 2005 -12.76%	-2.46%

To confirm our conclusions, we can examine the vertical analysis procedures for quarterly comparisons of Grand Forks' Limited-service Restaurant subsectors contributions. Figure 7 is a chart of the contributions provided by the city of Grand Forks' Limited-service Restaurants as a percentage of North Dakota's Accommodation and Food Services sector (72).

While Figure 7 shows seemingly large fluctuations, the data tell us that Grand Forks has contributed from 4.32 percent (Q4 2004) to 3.33 percent (Q3 2009) of North Dakota's Accommodation and Food Services sector during the period of our study. The difference is less than one percentage point. The decline in this subsector appears to reflect macroeconomic changes in relation to the sector as a whole because Grand Forks taxable sales and purchases from Limited-service Restaurants have remained about the same while its contributions have not. The service sector taxable sales and purchases in the rest of the state during this time period indicate that Grand Forks is losing market share, something that is unlikely to be related to the statewide smoke-free law because all communities were subject to the law.

Figure 7. Taxable Sales and Purchases of Grand Forks' Limited-service Restaurants (722211) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009

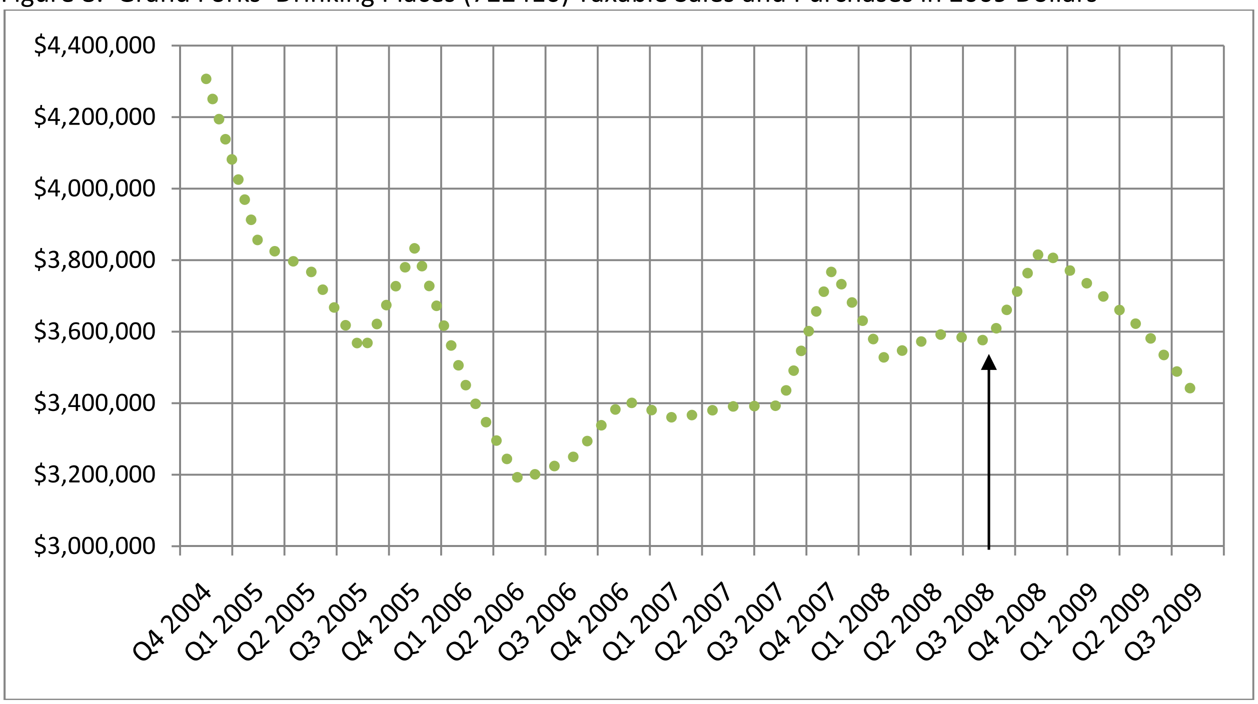


Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Drinking Places (722410)

Establishments listed under NAICS code 722410 are primarily known as bars, taverns, nightclubs, or drinking places engaged in preparing and serving alcoholic beverages for immediate consumption. In order to begin the analysis of this subsector we looked at seasonality trends in taxable sales and purchases. Figure 8 provides the seasonality trends of Drinking Places in the city of Grand Forks from the fourth quarter of 2004 through the third quarter of 2009. The city of Grand Forks had a sharp decline in taxable sales and purchases from Drinking Places from Q4 2004 through Q2 2006. The city shows consistency in its seasonality trends, especially with a recurring peak of taxable sales and purchases in the fourth quarter.

Figure 8. Grand Forks' Drinking Places (722410) Taxable Sales and Purchases in 2009 Dollars



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the Fargo and West Fargo smoking ban laws took effect.

Table 5 summarizes the greatest quarterly decrease in taxable sales and purchases for Drinking Places in Grand Forks and the percentage change in taxable sales and purchases which occurred in this subsector in our overall study period from Q4 2004 through Q3 2009.

We find that taxable sales and purchases from Drinking Places in Grand Forks also had a sharp decline which occurred in the same quarter as the two restaurant subsectors (Q4 2004 – Q1 2005). From the fourth quarter of 2004 through the third quarter of 2009, taxable sales and purchases for Drinking Places declined by 20.71 percent. Since Grand Forks does not have a smoking ban that encompasses its drinking places, we can assume this decline is not related to the smoke-free law.

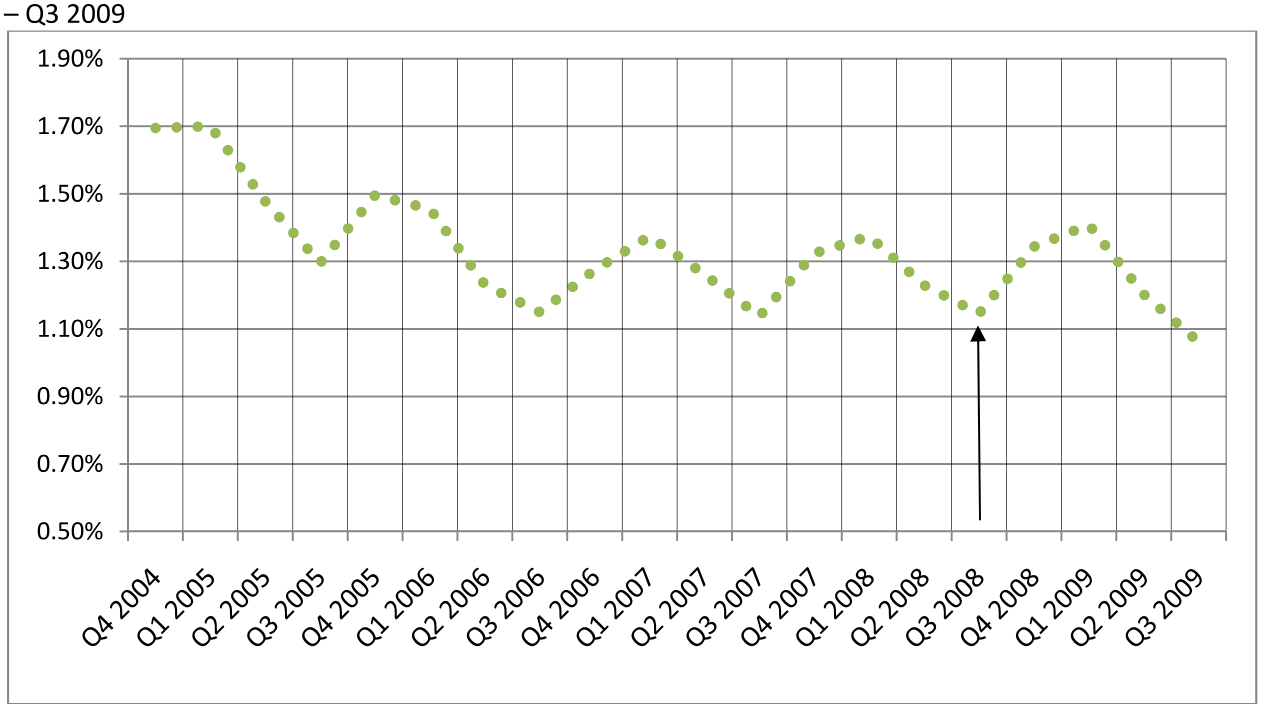
Table 5. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Drinking Places (722410) in Grand Forks, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)	Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009
Drinking Places (722410)	Q4 2004 – Q1 2005 -10.61%	-20.71%

The vertical analysis of Grand Forks' Drinking Places subsector will offer additional insight into the overall decline for this subsector. Figure 9 is a chart of the percentage of contributions provided by the city of Grand Forks' Drinking Places in relation to the North Dakota Accommodation and Food Services sector (72).

Overall, Grand Forks contributed between 1.70 percent (Q1 2005) and 1.06 percent (Q3 2009) of North Dakota's Accommodation and Food Services sector. There was a relatively consistent decline, controlling for seasonality, but the drop was only .64 percentage points. These data indicate that the contributions of the Drinking Places subsector in Grand Forks to North Dakota's overall Accommodation and Food Services sector has changed little from the end of 2004 through the third quarter of 2009, even though they have slightly declined.

Figure 9. Taxable Sales and Purchases of Grand Forks' Drinking Places (722410) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009



Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the Fargo and West Fargo smoking ban laws took effect.

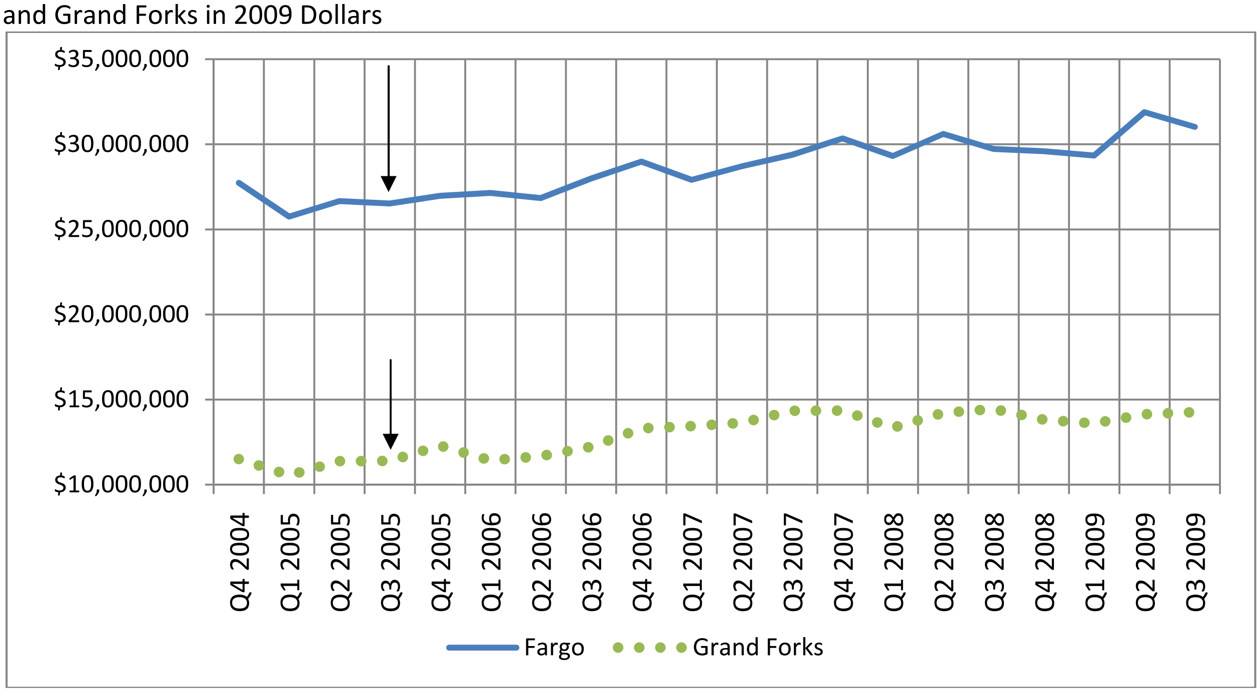
Fargo

Now that we have analyzed the city of Grand Forks as a benchmark for comparison purposes, we will look at one of the cities which is the focus of our study, Fargo. The important reference point to remember is the implementation of comprehensive smoking bans in Fargo and West Fargo which began in the third quarter of 2008. We are specifically interested in seeing if we can identify changes in economic patterns that differ in the Drinking Places subsector Fargo which can be directly linked with the passing of the comprehensive smoking bans relative to the other two subsectors.

Full-service Restaurants (722110)

Full-service Restaurants are primarily engaged in providing food services to patrons who order and are served while seated and pay after eating. To analyze this subsector, we will first take a look at seasonality trends in taxable sales and purchases in Fargo and Grand Forks. Figure 10 provides the seasonality trends of Full-service Restaurants in the cities of Fargo and Grand Forks from the fourth quarter of 2004 through the third quarter of 2009.

Figure 10. Comparison of Taxable Sales and Purchases for Full-service Restaurants (722110) in Fargo and Grand Forks in 2009 Dollars



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrows denote the time period in which the North Dakota smoke-free law took effect.

As we can see from Figure 10, taxable sales and purchases from the Full-service Restaurants subsector in Fargo increased during our study period (i.e., Q4 2004 through Q3 2009). The greatest decrease in Fargo's taxable sales and purchases in this subsector during our study period occurred from Q4 2004 through Q1 2005 (-7.16 percent) (see Table 6).

Fargo's largest quarterly decline in taxable sales and purchases for Full-service Restaurants was in the same quarter as Grand Forks (Q4 2004 – Q1 2005). However, it did not correspond to the implementation of the statewide smoke-free law in Q3 2005. We also find that taxable sales and purchases in Fargo increased from Q4 2004 through Q3 2009. Like Grand Forks, the tax data show that Fargo's Full-service Restaurants experienced no short-term economic impact from the smoke-free law and a long-term increase in this subsector during our study period, though by a smaller amount than Grand Forks (11.85 percent and 23.94 percent, respectively). Both cities also shared a correlation in the quarter of sharpest decline followed by steady growth since the point of largest decline. The commonality in trends suggests that Grand Forks and Fargo are reacting to similar macroeconomic events. We find no detrimental effects on Fargo's long-term taxable sales and purchases from Full-service Restaurants due to the North Dakota smoke-free law, just as in Grand Forks.

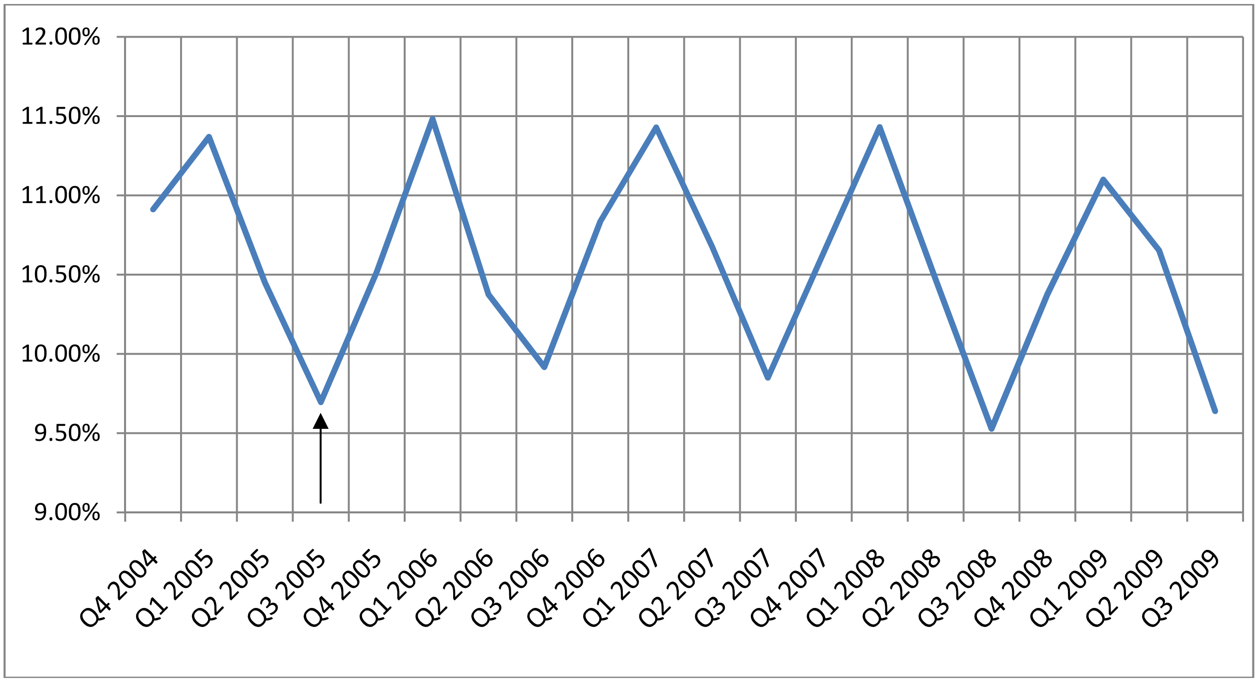
Table 6. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Full-service Restaurants (722110) in Fargo, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	**Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)**	**Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009**
Full-service Restaurants (722110)	Q4 2004 – Q1 2005 -7.16%	11.85%

Vertical analysis of Fargo's Full-service Restaurant contributions by quarter also confirms no detrimental economic impact as a result of the statewide smoke-free law. Figure 11 illustrates the contributions provided by the city of Fargo's Full-service Restaurant subsector to the North Dakota Accommodation and Food Services sector (72).

The seasonal fluctuation varied by as much as two percentage points. However, when controlling for seasonality, the overall change to Fargo's contributions from Full-service Restaurants as a percentage of North Dakota's Accommodation and Food Services taxable sales and purchases was modest from Q4 2004 through Q3 2009. The lack of any significant change in the trend line reinforces our confidence that the statewide smoke-free law did not create a noticeable impact on Fargo's Full-service Restaurant subsector.

Figure 11. Taxable Sales and Purchases of Fargo's Full-service Restaurants (722110) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009

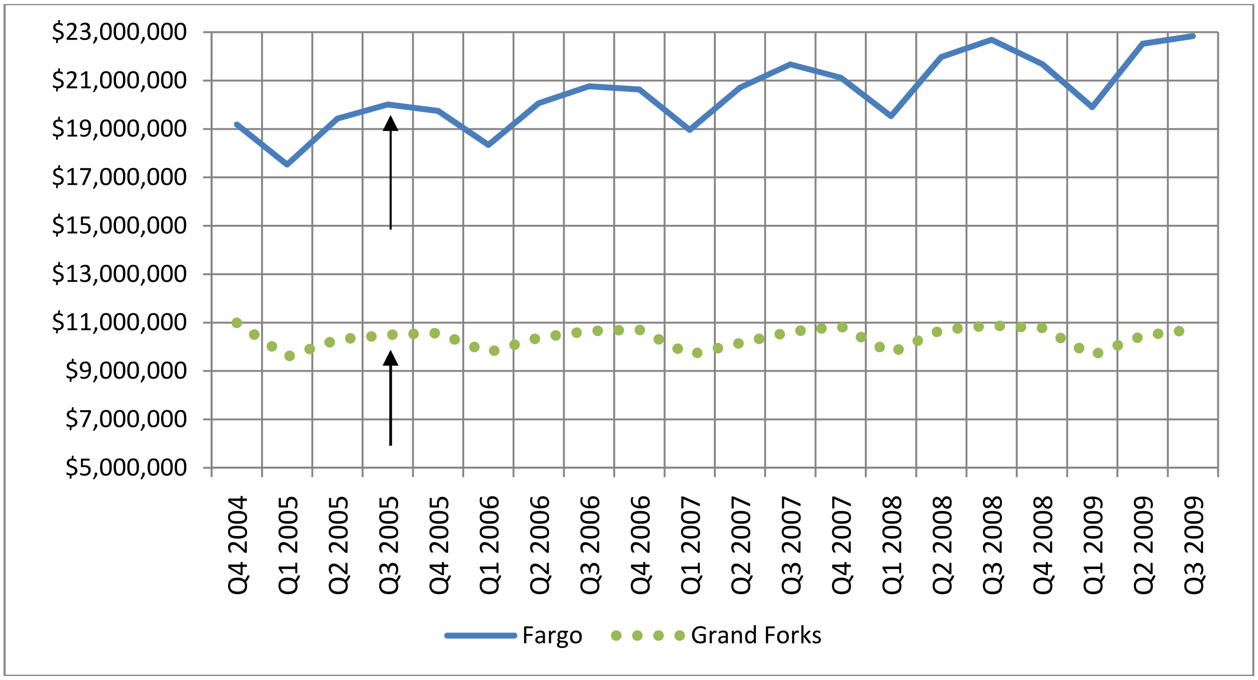


Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Limited-service Restaurants (722211)

Establishments listed under NAICS code 722211 are primarily engaged in providing food services where patrons generally order or select items and pay before eating and exclude snack and nonalcoholic beverage bars. Once again, we begin our analysis by looking at seasonality trends in taxable sales and purchases. Figure 12 provides the seasonality trends of Limited-service Restaurants in the cities of Fargo and Grand Forks from the fourth quarter of 2004 through the third quarter of 2009. We can see that the city of Fargo's Limited-service Restaurants subsector has been very consistent in its seasonality trends.

Figure 12. Comparison of Taxable Sales and Purchases for Limited-service Restaurants (722211) in Fargo and Grand Forks in 2009 Dollars



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrows denote the time period in which the North Dakota smoke-free law took effect.

Table 7 provides information on the greatest quarterly decrease in taxable sales and purchases for Limited-service Restaurants as well the percentage change in taxable sales and purchases for this subsector which occurred over the study period.

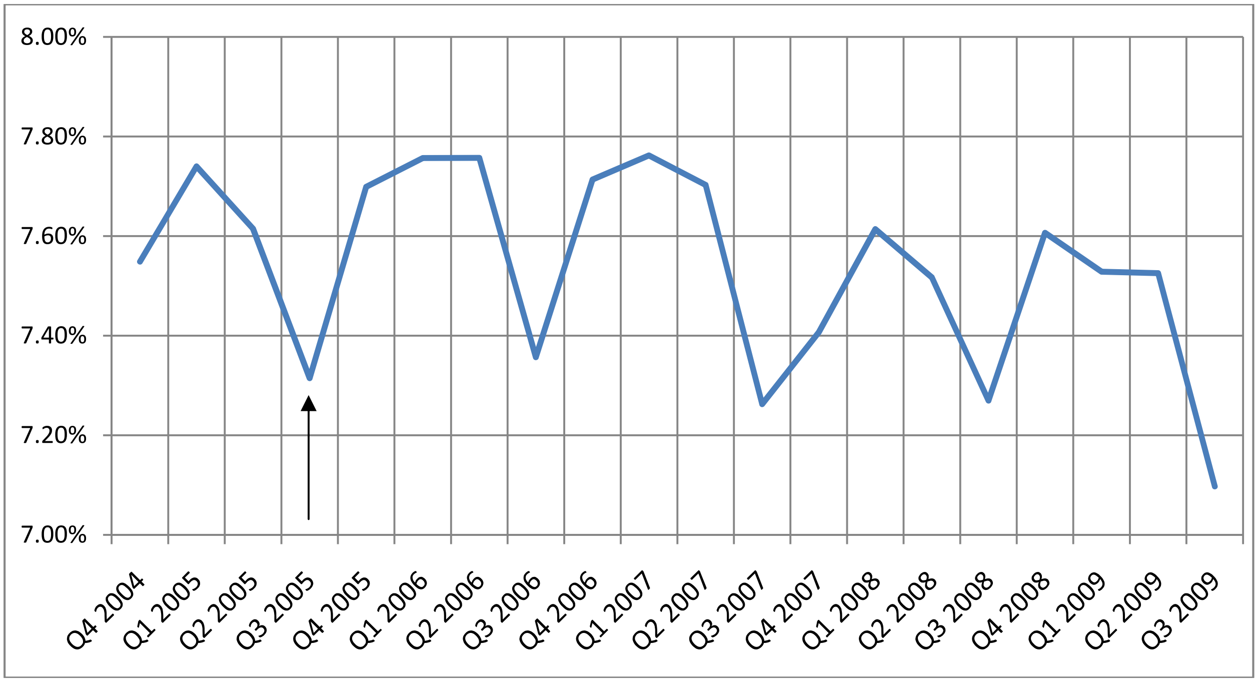
Fargo's greatest quarterly decline in taxable sales and purchases for Limited-service Restaurants (i.e., Q4 2004 – Q1 2005) did not occur in the quarter corresponding with the smoke-free law (Q3 2005). Moreover, we find that Fargo's taxable sales and purchases in the Limited-service Restaurant subsector increased 19.04 percent from Q4 2004 through Q3 2009. We can draw two conclusions based on this information: 1) the smoke-free law did not have a short-term economic impact on Limited-service Restaurants in Fargo and 2) there have been no long-term detrimental effects on Fargo's taxable sales and purchases from Limited-service Restaurants since the smoke-free law went into effect. It is noteworthy that taxable sales and purchases in this subsector are increasing in Fargo and slightly decreasing in Grand Forks.

Table 7. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Limited-service Restaurants (722211) in Fargo, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)	Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009
Limited-service Restaurants (722211)	Q4 2004 – Q1 2005 -8.63%	19.04%

The contributions provided by taxable sales and purchases from Limited-service Restaurants in the city of Fargo relative to the overall Accommodation and Food Services sector (72) in North Dakota are illustrated in Figure 13. Similar to the other subsectors, there is distinct seasonality in the Limited-service Restaurants subsector in Fargo. Overall, there was a slight downward trend in the market share captured by Fargo in this subsector, especially starting in the third quarter of 2007.

Figure 13. Taxable Sales and Purchases of Fargo's Limited-service Restaurants (722211) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009

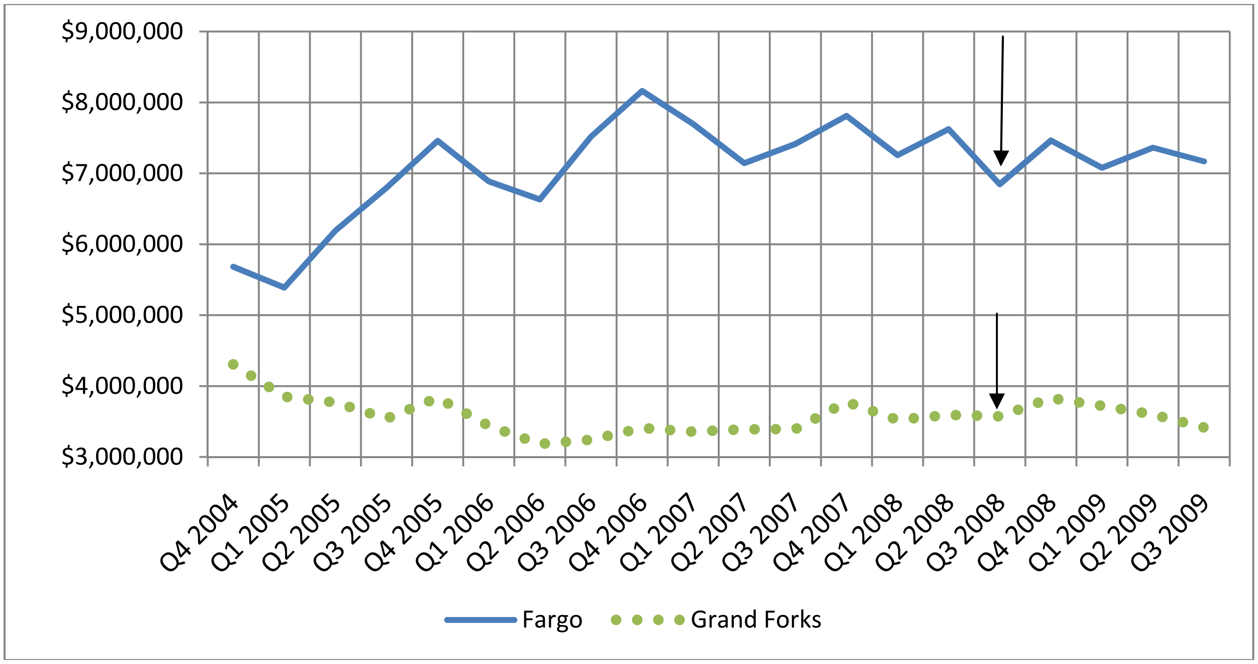


Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Drinking Places (722410)

Establishments listed under NAICS code 722410 are comprised of establishments known as bars, taverns, nightclubs, or drinking places primarily engaged in preparing and serving alcoholic beverages for immediate consumption. This is the first time in our analysis that our attention will shift more directly to the comprehensive smoking bans. The key date to remember is the third quarter of 2008 when implementation of the ordinances began. We will first begin our review with an assessment of seasonality trends in taxable sales and purchases. Figure 14 shows the seasonality trends of Drinking Places in the cities of Fargo and Grand Forks from the fourth quarter of 2004 through the third quarter of 2009.

Figure 14. Comparison of Taxable Sales and Purchases for Drinking Places (722410) in Fargo and Grand Forks in 2009 Dollars



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrows denote the time period in which the Fargo and West Fargo smoking ban laws took effect.

As we can see in Figure 14, the city of Fargo had a sharp increase in Drinking Places' taxable sales and purchases beginning in the first quarter of 2005 and another surge starting in the second quarter of 2006. What is notable is that the greatest quarterly decline (-10.2%) in taxable sales and purchases in Fargo from Q4 2004 through Q3 2009 corresponded with the implementation of the 2008 comprehensive smoking bans (see Table 8). Since a similar decline did not occur in Grand Forks, one can argue that the drop in sales is due to the ordinances. However, the impact was short-term since there was an offsetting increase in taxable sales in Fargo the very next quarter. Overall, Fargo's taxable sales and purchases increased by 26.15 percent in the Drinking Places subsector from Q4 2004 through Q3 2009.

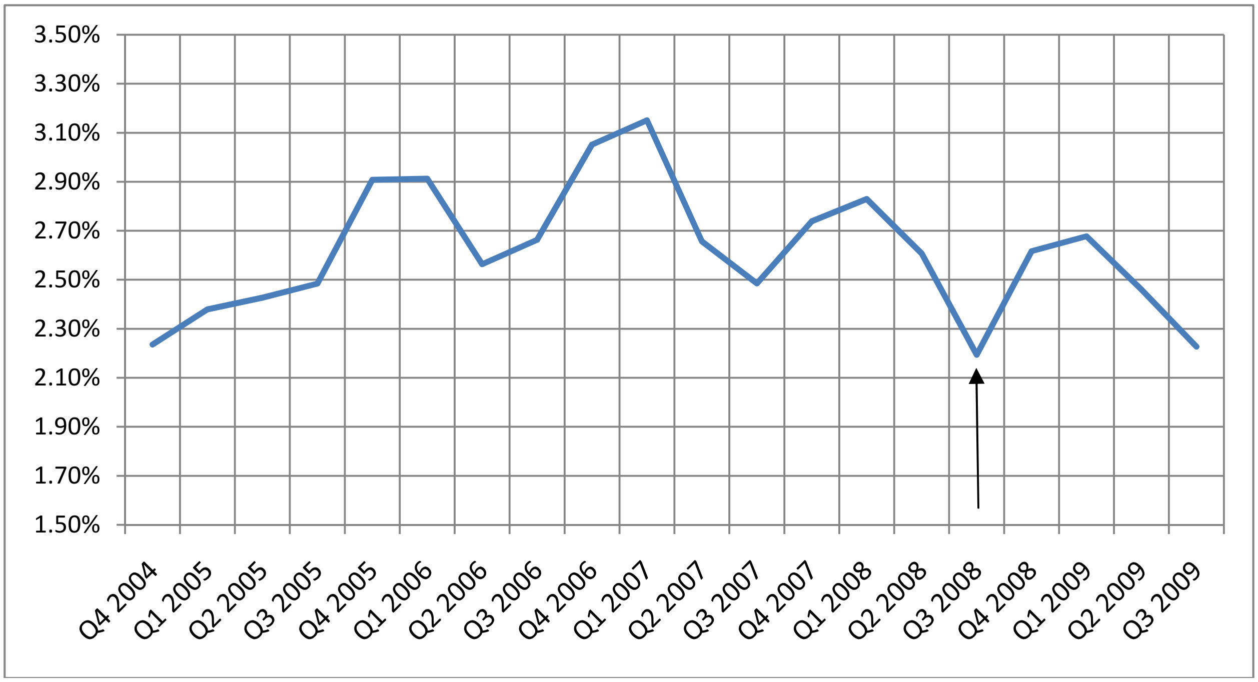
Table 8. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Drinking Places (722410) in Fargo, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	**Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)**	**Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009**
Drinking Places (722410)	Q2 2008 – Q3 2008 -10.20%	26.15%

Our review of the impact of the three smoking ordinances (i.e., the North Dakota smoke-free law in 2005 and the Fargo and West Fargo comprehensive smoking bans for bars in 2008) and their effect upon Fargo's restaurants and bars was mixed. We find that taxable sales and purchases in Fargo had a sharp decline in the first quarter of 2005 as they did in Grand Forks as well, suggesting a larger macroeconomic event which affected all service industries. However, this was prior to the statewide smoke-free law, so that law is unlikely to be the cause. In contrast, we find evidence that the Fargo and West Fargo comprehensive smoking bans had a short-term impact on taxable sales and purchases in Fargo bars but no demonstrable long-term impact. We found that the sharpest decline in taxable sales and purchases did occur during the time of the Fargo and West Fargo smoking bans and this did not occur in Grand Forks. In Grand Forks, the decrease was only .54 percent while Fargo declined 10.20 percent. If we find this exact same trend in West Fargo's analysis, we can be certain the majority of this downward trend was caused by the comprehensive smoking bans. In interpreting the economic impact of an ordinance, one must be mindful of context. In the case of Fargo, taxable sales and purchases from Drinking Places have increased by $321,103 since the third quarter of 2008. In contrast, Grand Forks' taxable sales and purchases have decreased by $159,352. Thus, the initial economic shock of the ordinances was short-term and the longer-term economic profile of Drinking Places in Fargo, after the implementation of the ordinance, outperformed the comparison city of Grand Forks, which still allows smoking in drinking places.

The vertical analysis of Fargo's quarterly Drinking Places contributions is shown in Figure 15. While Figure 15 shows seemingly large fluctuations, the data tell us that Fargo has consistently contributed no more than 3.15 percent (Q1 2007) and no less than 2.19 percent (Q3 2008) of North Dakota's Accommodation and Food Services sector from its Drinking Places subsector. The city of Fargo's contributions from Drinking Places as a percentage of North Dakota's Accommodation and Food Services sector taxable sales and purchases have been mixed since 2004. After accounting for the seasonality effects, one finds a general upward trend from the fourth quarter of 2004 until the first quarter of 2007. A gradual decline ensued, again after considering seasonality, with a sharp drop in the third quarter of 2008. As noted in the horizontal analysis, there was a quick rebound after the initial shock. The overall change in the proportion Fargo's Drinking Places subsector contributes to North Dakota's Accommodations and Food Service was less than 1 percentage point.

Figure 15. Taxable Sales and Purchases of Fargo's Drinking Places (722410) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009



Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the Fargo and West Fargo smoking ban laws took effect.

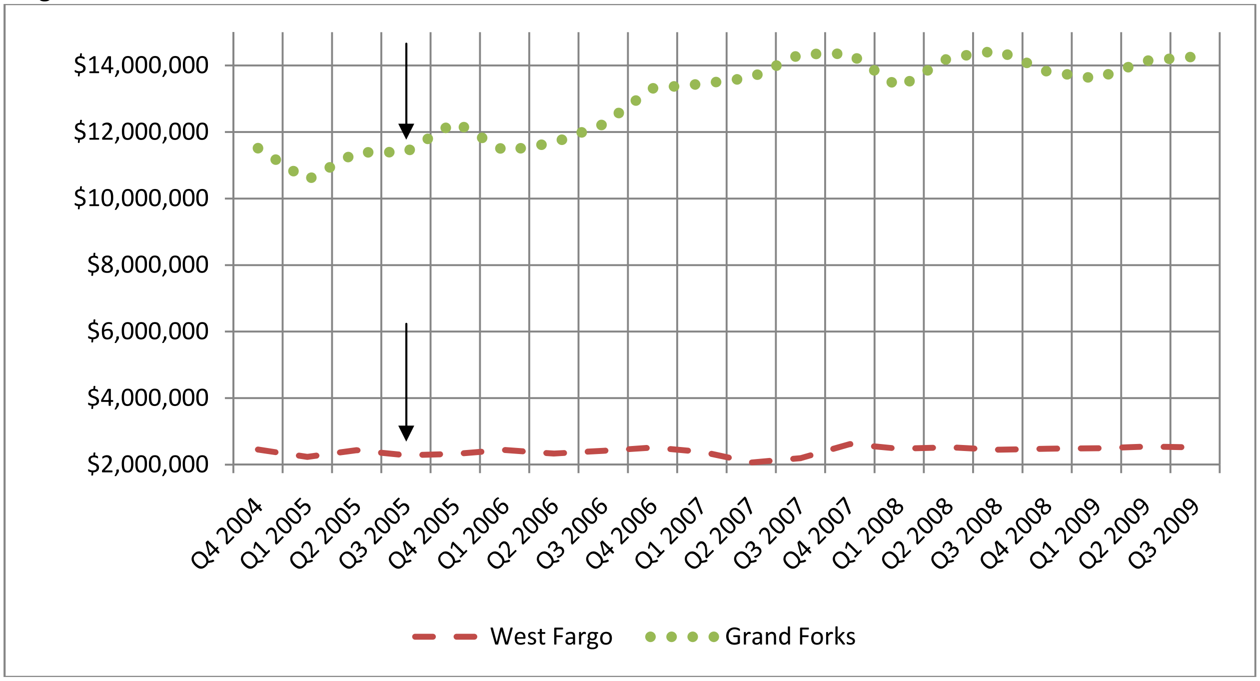
West Fargo

We now turn our attention to West Fargo. West Fargo also passed and began implementation of a comprehensive smoking ban in the third quarter of 2008. Similar to Fargo, our focus will be specifically on determining whether the trend lines in West Fargo differ from those of our benchmark city, Grand Forks, with regard to the Drinking Places subsector. However, we first look to provide context by examining restaurants for any potential signs of an impact from the statewide smoke-free law that began in the third quarter of 2005.

Full-service Restaurants (722110)

Full-service Restaurants are engaged in providing food services to patrons who order and are served while seated and pay after eating. To analyze this subsector we shall first take a look at seasonality trends in taxable sales and purchases in West Fargo and Grand Forks. Figure 16 shows the seasonality trends of Full-service Restaurants in the cities of West Fargo and Grand Forks from the fourth quarter of 2004 through the third quarter of 2009.

Figure 16. Comparison of Taxable Sales and Purchases for Full-service Restaurants (722110) in West Fargo and Grand Forks in 2009 Dollars



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrows denote the time period in which the North Dakota smoke-free law took effect.

As we can see from Figure 16, the city of West Fargo has remained steady in its taxable sales and purchases from its Full-service Restaurants subsector during our study period (i.e., Q4 2004 – Q3 2009). Table 9 provides information on the greatest quarterly decrease in taxable sales and purchases for Full-service Restaurants in West Fargo as well the overall percentage change in taxable sales and purchases which occurred in this subsector from Q4 2004 through Q3 2009.

Similar to Grand Forks and Fargo, taxable sales and purchases for Full-service Restaurants in West Fargo showed a quarterly decrease from Q4 2004 to Q1 2005 (9.05 percent). However, the greatest quarterly decline was from Q1 2007 to Q2 2007. In both cases, these two periods of decline do not correlate with the statewide law which began in Q3 2005. Thus, one can conclude that there is no direct evidence of an economic impact from the statewide law. Overall, we find that while taxable sales and purchases for Full-service Restaurants in West Fargo increased during our study period, they did so at a much slower rate than in Grand Forks and Fargo.

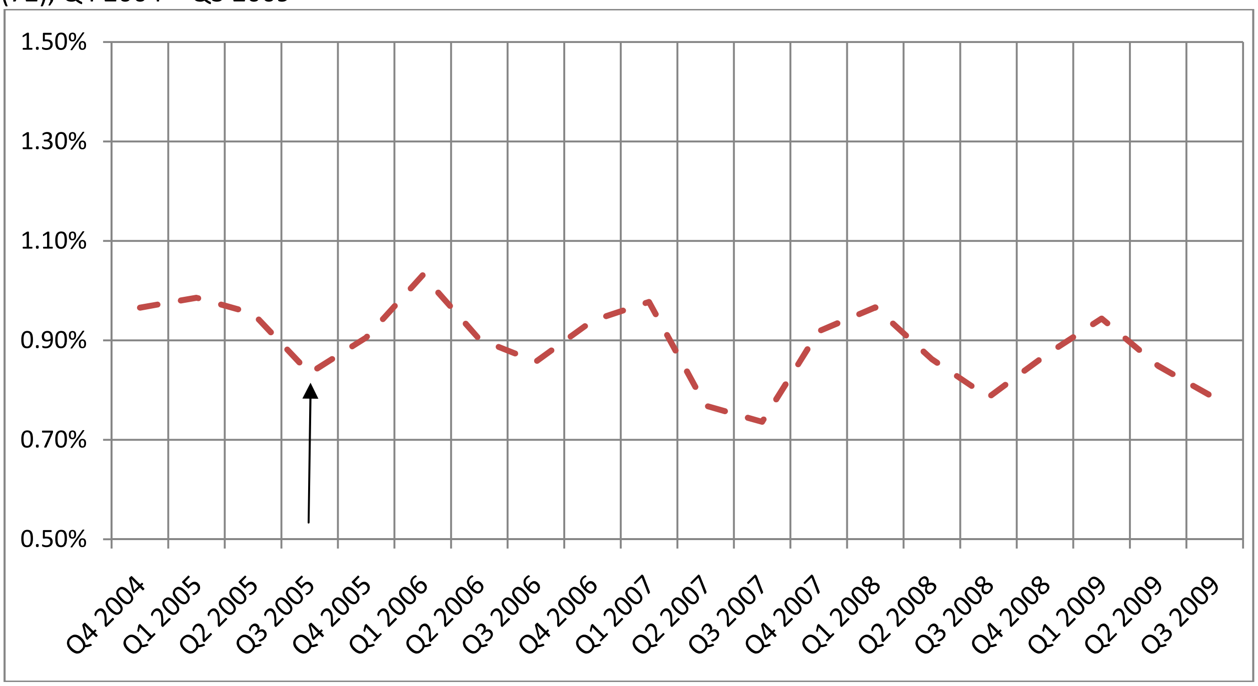
Table 9. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Full-service Restaurants (722110) in West Fargo, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	**Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)**	**Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009**
Full-service Restaurants (722110)	Q1 2007 – Q2 2007 -13.40%*	2.79%

* This is the sharpest quarterly decline during our study period. Since Q4 2004 is the start of study period, the change between Q3 2004 – Q4 2004 was not used. (Decline Q3 2004 – Q4 2004: -17.56%)

The vertical analysis of West Fargo's Full-service Restaurant contributions as a proportion of North Dakota's Accommodation and Food Services sector is shown in Figure 17. After accounting for seasonal shifts, the data indicate that West Fargo's contributions from Full-service Restaurants as a percentage of North Dakota's Accommodations and Food Service sector taxable sales and purchases have been relatively stable since the end of 2004 through the third quarter of 2009. The downward spike in the third quarter of 2005, the point at which the statewide smoking bans were implemented, is simply the continuation of a seasonal trend in third quarter declines.

Figure 17. Taxable Sales and Purchases of West Fargo's Full-service Restaurants (722110) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009

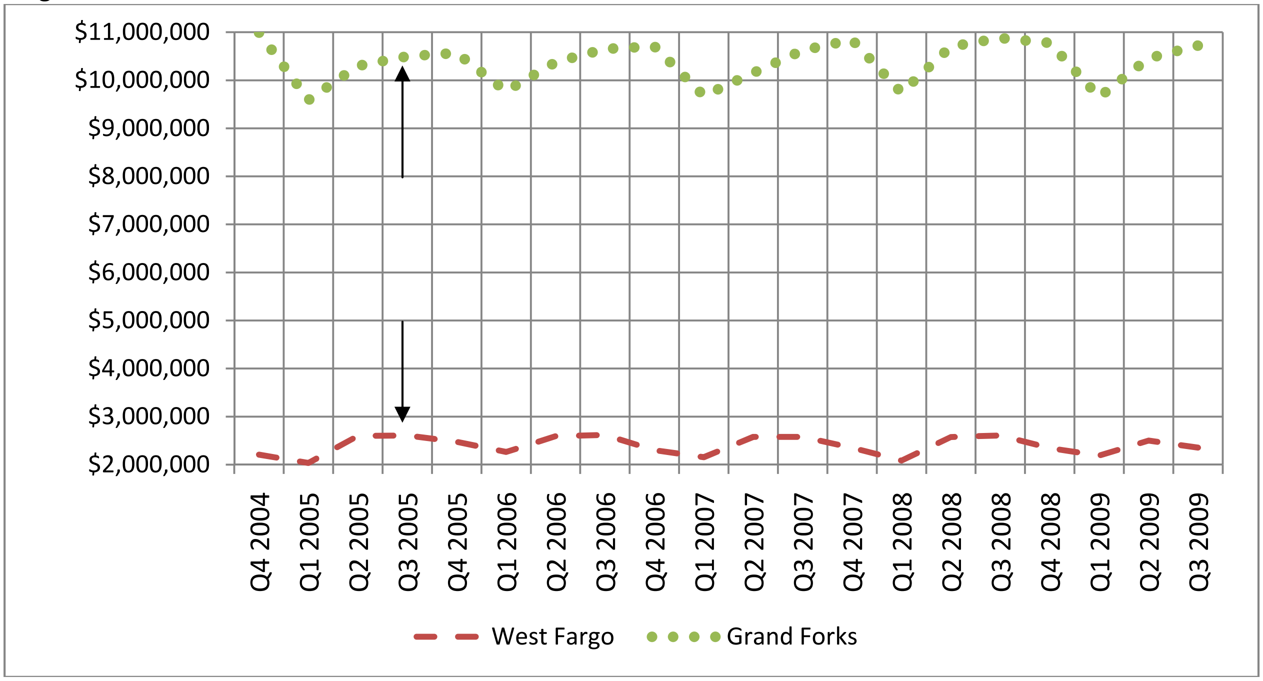


Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Limited-service Restaurants (722211)

Establishments listed under NAICS code 722211 are engaged in providing food services where patrons generally order or select items and pay before eating, excluding snack and nonalcoholic beverage bars. Figure 18 shows the seasonality trends of Limited-service Restaurants in the cities of West Fargo and Grand Forks from the fourth quarter of 2004 through the third quarter of 2009.

Figure 18. Comparison of Taxable Sales and Purchases for Limited-service Restaurants (722211) in West Fargo and Grand Forks in 2009 Dollars



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrows denote the time period in which the North Dakota smoke-free law took effect.

As we can see in Figure 18, the city of West Fargo has remained steady in its taxable sales and purchases over the study period and very consistent in its seasonality trends from the Limited-service Restaurants subsector. Its greatest quarterly decline was between the third and fourth quarter of 2006 (see Table 10).

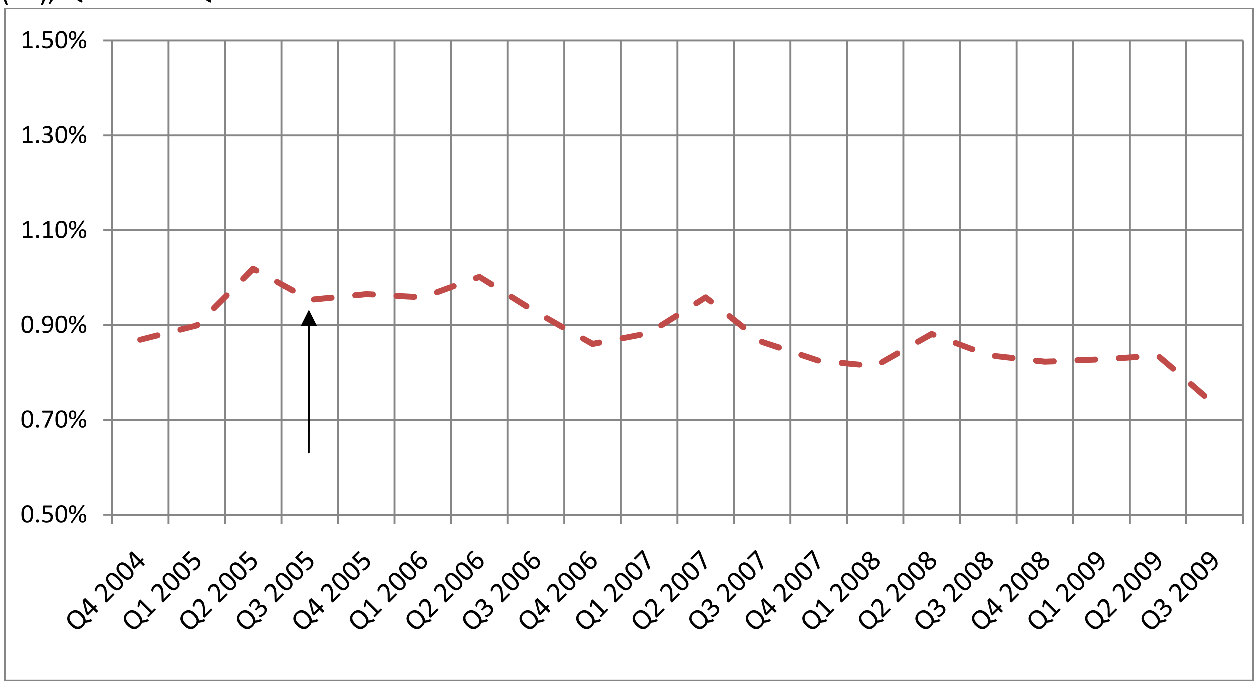
Overall, West Fargo increased its taxable sales and purchases in the Limited-service Restaurant subsector by nearly 7 percent from Q4 2004 through Q3 2009. The lack of any sharp decline in the third quarter of 2005 or a sustained loss suggests that the statewide smoke-free law had no short-term or long-term economic impact on West Fargo's Limited-service Restaurants.

Table 10. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Limited-service Restaurants (722211) in West Fargo, for Study Period Q4 2004 – Q3 2009

NAICS Subsector (Subsector Code)	Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)	Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009
Limited-service Restaurants (722211)	Q3 2006 – Q4 2006 -12.08%	6.64%

A review of the contribution of West Fargo's Limited-service Restaurants to North Dakota's Accommodation and Food Services sector reveals a continuous decline starting in the second quarter of 2007, after accounting for seasonality (see Figure 19). This is similar to the trend we found in Fargo but inconsistent with what we saw in Grand Forks. Nonetheless, the downward slide does not align with the statewide smoke-free law, thus we can conclude the 2005 ordinance did not have a demonstrable impact on this sector in West Fargo.

Figure 19. Taxable Sales and Purchases of West Fargo's Limited-service Restaurants (722211) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009

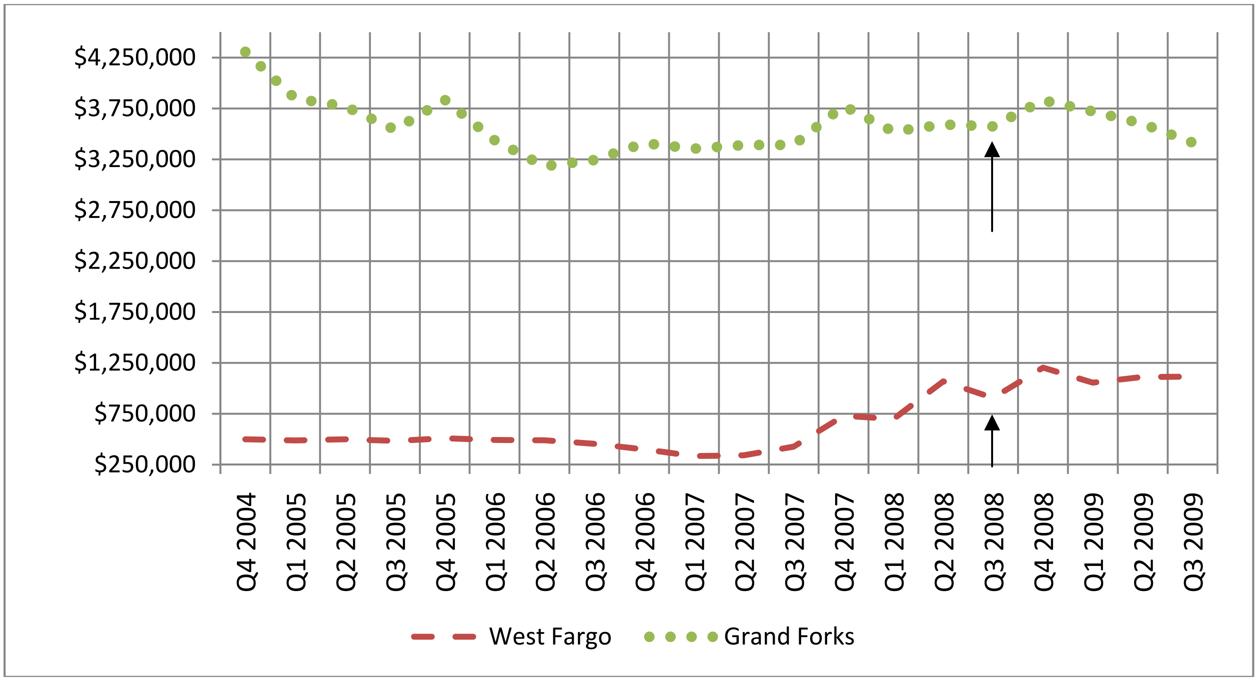


Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Drinking Places (722410)

NAICS code722410 comprises establishments known as bars, taverns, nightclubs, or drinking places primarily engaged in preparing and serving alcoholic beverages for immediate consumption. A review of the seasonality trends in taxable sales and purchases among Drinking Places in the cities of West Fargo and Grand Forks from the fourth quarter of 2004 through the third quarter of 2009 is shown in Figure 20.

Figure 20. Comparison of Taxable Sales and Purchases for Drinking Places (722410) in West Fargo and Grand Forks in 2009 Dollars



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrows denote the time period in which the Fargo and West Fargo smoking ban laws took effect.

The city of West Fargo has had a sharp increase in Drinking Places' taxable sales and purchases since the first quarter of 2007. To contrast West Fargo with Grand Forks, this subsector's taxable sales and purchases in Grand Forks started declining in the fourth quarter of 2008. Remarkably, West Fargo increased its taxable sales and purchases in this subsector by 123.02 percent over our study period from Q4 2004 through Q3 2009 (see Table 11). However, a noticeable dip in taxable sales and purchases did occur in the third quarter of 2008, consistent with the implementation of the comprehensive smoking bans. This decline was neither the greatest quarterly decline for this subsector in West Fargo nor was it long lasting. Nonetheless, the lack of a corresponding dip in Grand Forks' taxable sales and purchases in the third quarter of 2008 reinforces our opinion that the comprehensive smoking bans did have a short-term impact on West Fargo's Drinking Places' taxable sales and purchases, but no long-term impact.

Table 11. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for Drinking Places (722410) in West Fargo, for Study Period Q4 2004 – Q3 2009

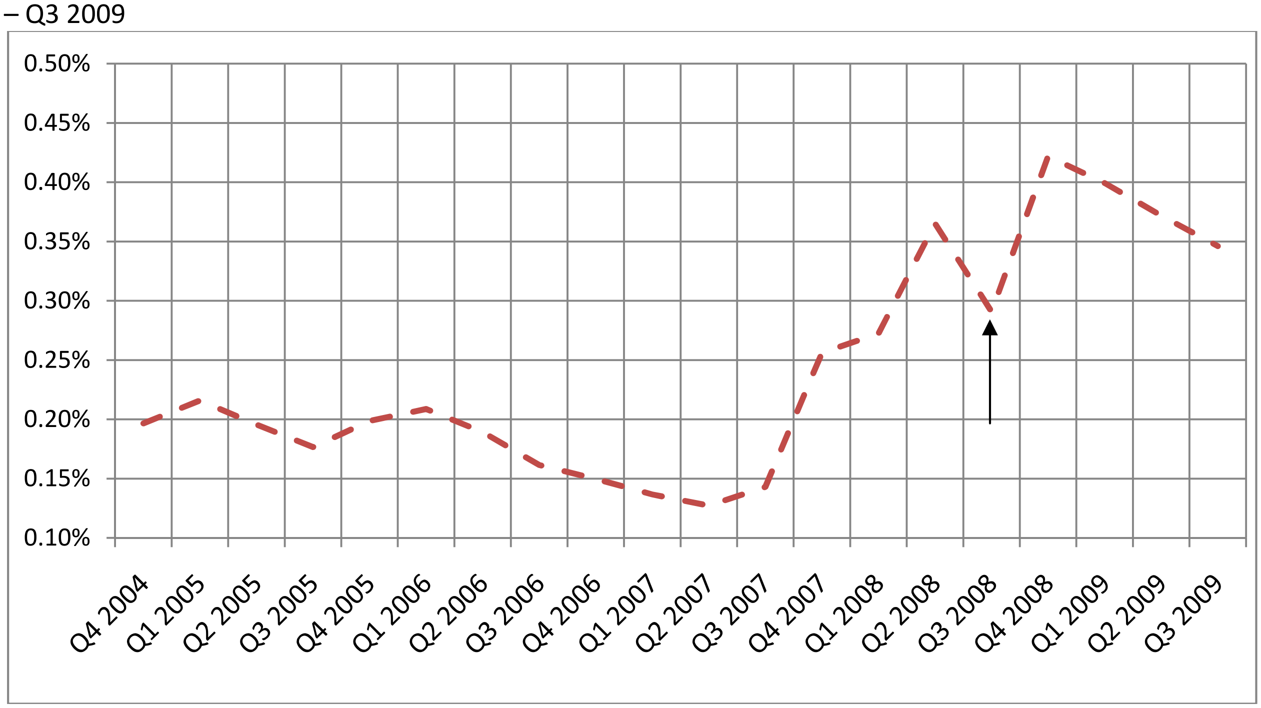
NAICS Subsector (Subsector Code)	Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)	Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009
Drinking Places (722410)	Q4 2006 – Q1 2007 -16.69%	123.02%

Over the long-term, West Fargo's growth in this subsector has been significant. For example: 1) since the third quarter of 2008, West Fargo's taxable sales and purchases from Drinking Places has increased by $206,696 (22.78 percent increase), 2) West Fargo has experienced one of its largest quarters of growth since the first quarter of 2002, an increase of 32.66 percent in Q4 2008, and 3) West Fargo has also had its largest quarter of taxable sales and purchases after the smoking bans were passed.

Figure 21 shows the percentage of contributions provided by the city of West Fargo's Drinking Places taxable sales and purchases in relation to North Dakota's Accommodation and Food Services sector's taxable sales and purchases (72).

West Fargo's contributions from Drinking Places as a percentage of North Dakota's Accommodation and Food Services sector have increased from the end of 2004 until the third quarter of 2009, even though West Fargo's taxable sales and purchases make up only a small fraction of North Dakota's Accommodation and Food Services sector. As noted earlier, a sharp decline in West Fargo's contributions from Drinking Places is apparent in the third quarter of 2008, which is similar to Fargo. This reinforces the claim that the smoking bans did have a short-term effect on West Fargo's Drinking Places.

Figure 21. Taxable Sales and Purchases of West Fargo's Drinking Places (722410) as a Percentage of Taxable Sales and Purchases of North Dakota's Accommodation and Food Services Sector (72), Q4 2004 – Q3 2009



Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the Fargo and West Fargo smoking ban laws took effect.

Macroeconomic Effects Analysis

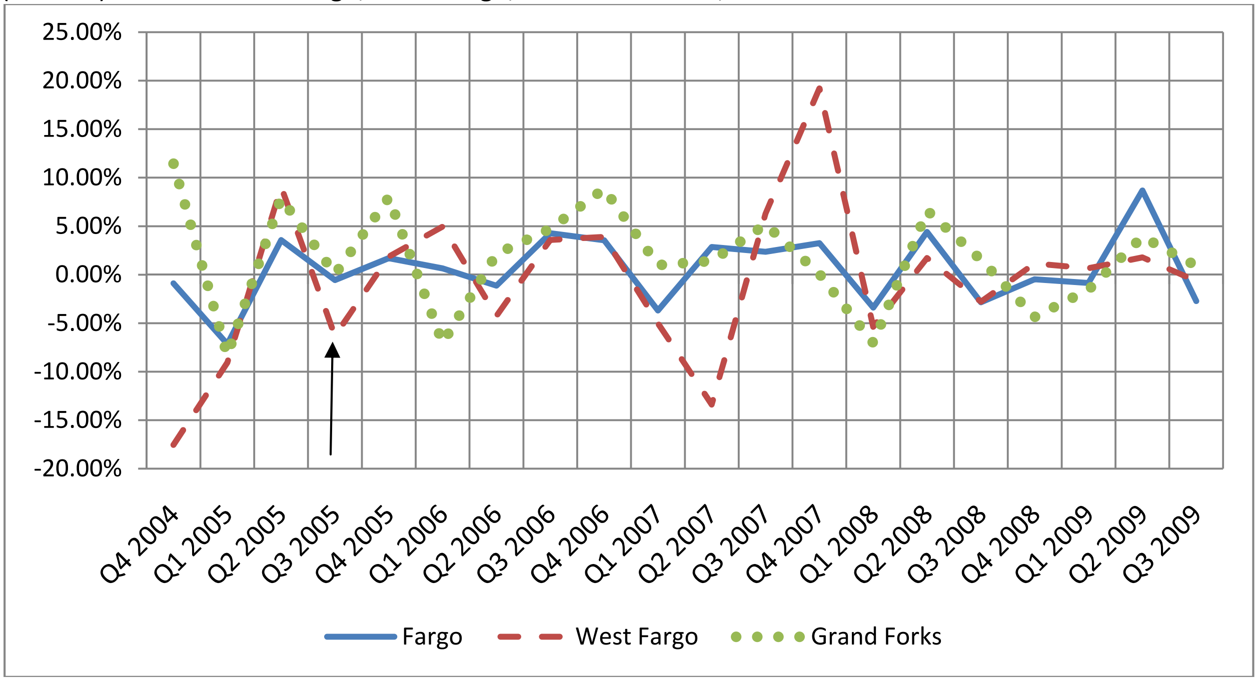
As explained in the methodology, this study utilizes horizontal and vertical analysis techniques in order to understand the seasonality trends faced by various service subsectors. For context, we present the trend lines for the three cities in one figure. Figures 22, 23, and 24 show seasonality trends for each of our NAICS code subsectors for Fargo, West Fargo, and Grand Forks.

Despite the fact that each city has vastly different dollar values of taxable sales and purchases, Figure 22 shows the similarities in the overall relative change in quarterly taxable sales and purchases experienced in the Full-service Restaurant subsector in each city. These trend lines demonstrate the same pattern of seasonality. For the most part, that pattern between cities is very consistent with the exception of West Fargo which has much greater volatility. Nonetheless, no distinct variation exists in the third quarter of 2005 which would indicate an economic impact from the statewide smoke-free law.

Figure 23 shows even greater similarities in the quarterly changes of the Limited-service Restaurant subsector than we found in the Full-service Restaurant subsector. Once again, no notable deviations are apparent in the third quarter of 2005 which would indicate the presence of an economic impact due to the statewide smoke-free law.

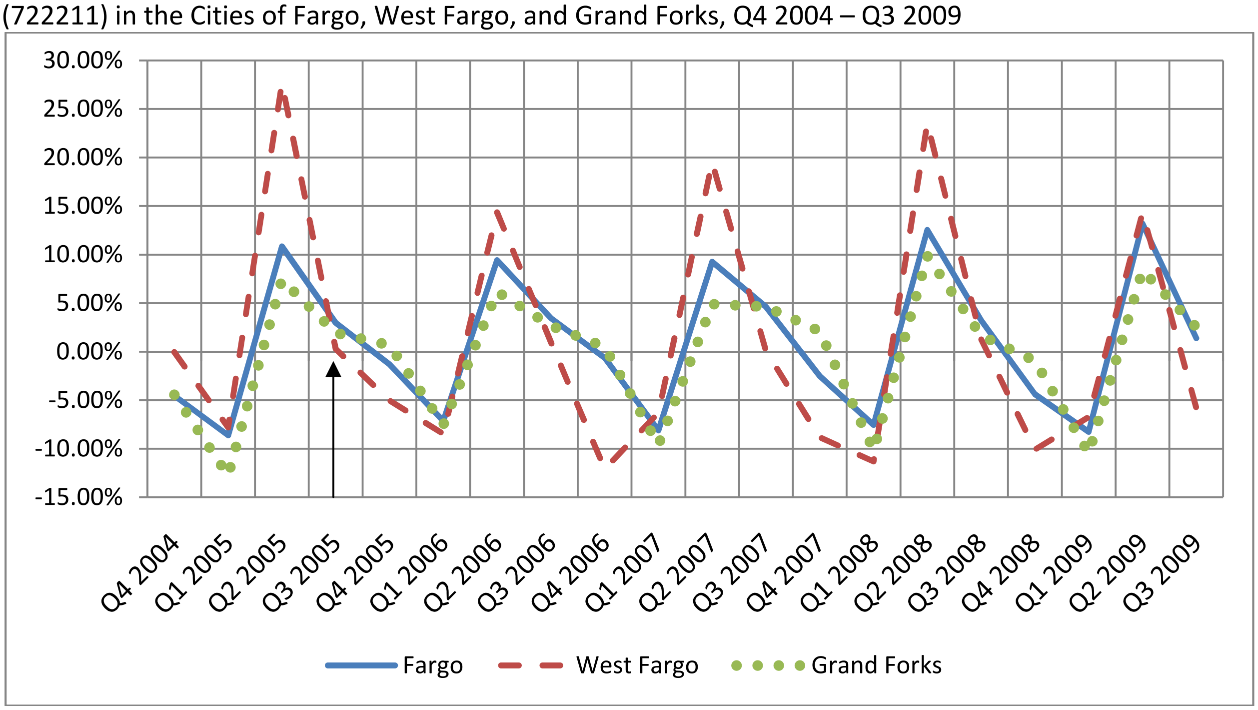
Figure 24 shows an overlay of the trend lines in the Drinking Places subsector for each of the cities under investigation. In general, the seasonality patterns are consistent among the three cities. What is most notable is the distinct wide variations in West Fargo particularly after the first quarter of 2007. However, our main concern is directed at the third quarter of 2008 when the comprehensive smoking bans were implemented. The taxable sales and purchases in Grand Forks slightly dips while Fargo and West Fargo have notable declines. This is a relatively clear indication of an economic impact due to the comprehensive smoking bans. However, the deviation of Fargo and West Fargo from the pattern demonstrated by Grand Forks quickly realigned following the third quarter of 2008. This is a clear indication that the economic impact of the comprehensive smoking bans was short-term and not long-lasting. Another anomaly observed since the smoking bans went into effect was in Q2 of 2009. This shows that Grand Forks was experiencing a negative microeconomic effect. Since Grand Forks had not passed a comprehensive smoking ban at of the time of this study, it would be difficult to state what was causing this anomaly without further investigation.

Figure 22. Quarterly Percentage Change in Taxable Sales and Purchases for *Full-service Restaurants* (722110) in the Cities of Fargo, West Fargo, and Grand Forks, Q4 2004 – Q3 2009



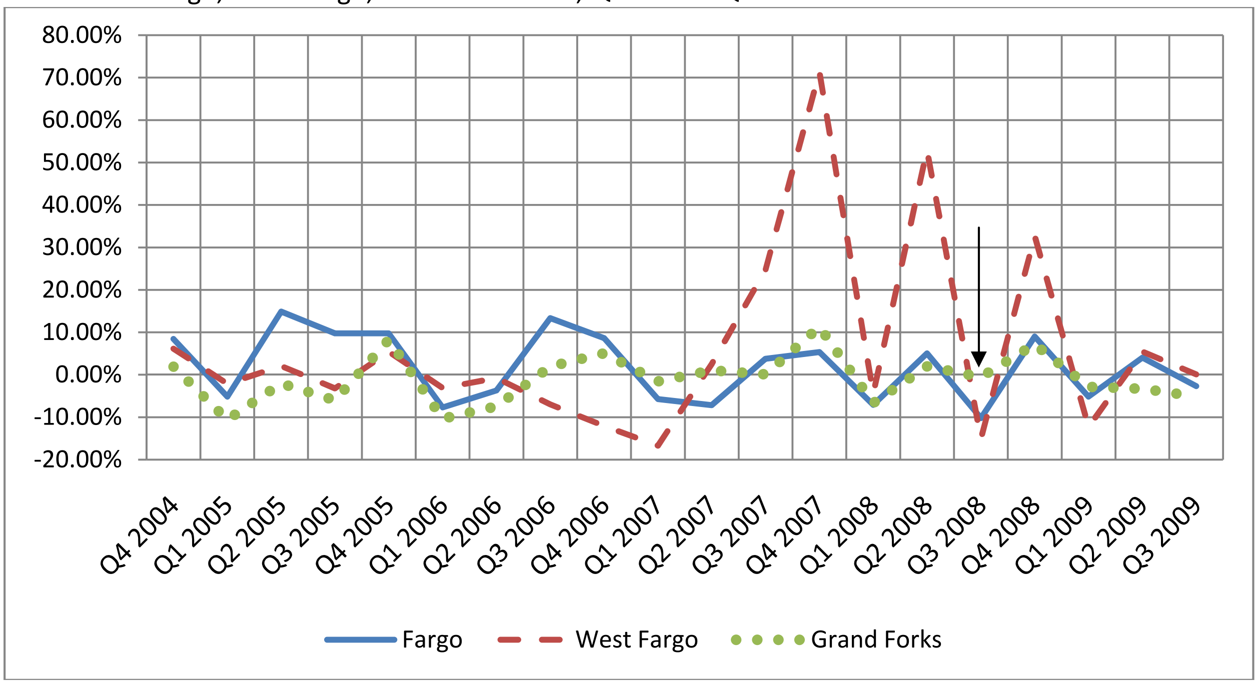
Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Figure 23. Quarterly Percentage Change in Taxable Sales and Purchases for *Limited-service restaurants* (722211) in the Cities of Fargo, West Fargo, and Grand Forks, Q4 2004 – Q3 2009



Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Figure 24. Quarterly Percentage Change in Taxable Sales and Purchases for *Drinking Places* (722410) in the Cities of Fargo, West Fargo, and Grand Forks, Q4 2004 – Q3 2009

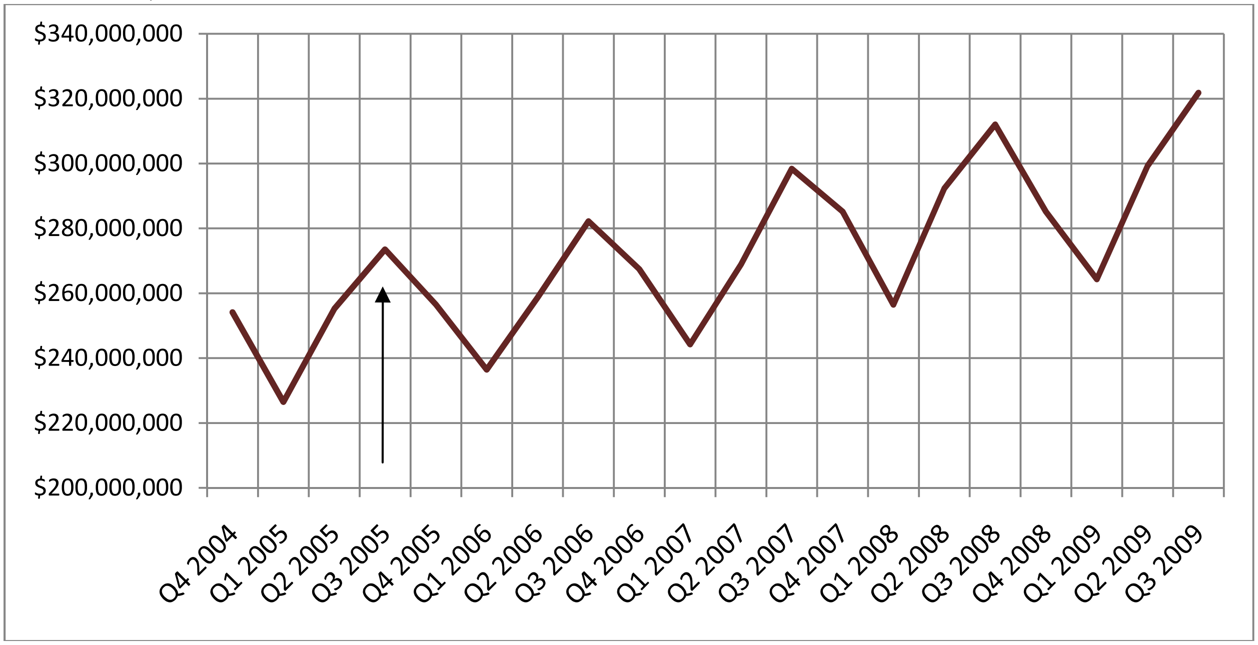


Note: This figure does not begin at 0 percent. It focuses on the highest and lowest contribution percentages provided during the period Q4 2004 through Q3 2009 in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the Fargo and West Fargo smoking ban laws took effect.

Finally, we reviewed the trend line in North Dakota's overall Accommodation and Food Services sector to offer some context to the larger statewide economic profile.

From Figure 25, we find that North Dakota's Accommodation and Food Services sector also is subject to seasonality trends. The first quarter of each year is typically the lowest point while the third quarter is typically the highest point. This reflects the impact of seasonal activities such as holidays and school. We found North Dakota's Accommodation and Food Services sector followed the normal trend in Q3 2005, which indicates that the North Dakota smoke-free law had no discernable effect upon the service sector. The trend line also shows that North Dakota's Accommodation and Food Services sector has been steadily increasing from the Q4 2004 through Q3 2009, which amounts to an increase of 26.62 percent.

Figure 25. Taxable Sales and Purchases for North Dakota's Accommodation and Food Services Sector in 2009 Dollars, Q4 2004 – Q3 2009



Note: This figure does not begin at a 0 dollar value. It focuses on the highest and lowest taxable sales and purchases dollar amount provided during the survey period in order to increase the level of detail in the peaks and valleys and provide more detailed information for the reader. The arrow denotes the time period in which the North Dakota smoke-free law took effect.

Table 12 provides information on the greatest quarterly decrease in taxable sales and purchases for North Dakota's Accommodation and Food Services sector as well as the overall percentage change in taxable sales and purchases which occurred in this sector from Q4 2004 through Q3 2009.

Table 12 confirms two of the earlier conclusions made in this study: 1) there was a major macroeconomic event which occurred between Q4 2004 and Q1 2005 which created the largest percentage decline observed between any two quarters during this study period and 2) North Dakota's Accommodation and Food Services sector has been increasing steadily during the period of our study (26.62 percent overall). This information also confirms that even if a service subsector within a city is increasing but the rate of increase is lower than the overall service sector itself, the city's contribution will decrease.

Table 12. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for North Dakota's Accommodation and Food Services Sector (72), for Study Period Q4 2004 – Q3 2009

NAICS Sector (Sector Code)	Sharpest Decline in Taxable Sales and Purchases (Period of Occurrence and Percentage)	Change in Taxable Sales and Purchases for Study Period Q4 2004 – Q3 2009
Accommodation and Food Services (72)	Q4 2004 – Q1 2005 -10.89%	26.62%

SUMMARY

The Accommodation and Food Services sector is an important and growing industry in North Dakota and made up over 9 percent of North Dakota's taxable sales and purchases in 2008. The purpose of this research was to explore how laws such as smoking bans would affect this sector and, more directly, how the Fargo and West Fargo comprehensive smoking bans affected Drinking Places, a subsector of the Accommodation and Food Services sector. We approached this task by segregating the information so that only data pertaining to the bar industry, and not other industries unrelated to the smoking bans, would be analyzed. We also addressed the impact of inflation upon our data so that if there were increases in taxable sales and purchases we would know that they were caused by sales and not by the cost of goods (i.e., inflation).

Our analytical approach follows that of *The Impact of North Dakota's Smoke-Free Law on Restaurant and Bar Taxable Sales* study with some alterations. This Minot study segregated industrial information comparing specific NAICS code subsectors, namely NAICS 722110 (Full-service Restaurants), 722211 (Limited-service Restaurants), and 722410 (Drinking Places – Alcoholic Beverages) as a percentage of NAICS 44-45 (Retail Trade sector). Our study differed slightly in the sector used for vertical analysis. Our study used the same NAICS subsectors, but the subsectors were measured instead as a percentage of the NAICS 72 (Accommodation and Food Services sector) in which these subsectors resided. The key in both studies for segregating the information to be analyzed was the use of specific NAICS codes related to service industries.

We used a variety of methods to address Siegel's criteria for a quality study, making us confident that the information would provide an accurate portrayal of the economic impacts of the 2008 comprehensive smoking bans passed by Fargo and West Fargo on Drinking Places in these cities.

- We chose to analyze the NAICS code subsectors related to restaurants because they would provide us with two key pieces of information related to Drinking Places. First, North Dakota passed its statewide smoke-free law in 2005 which banned smoking in restaurants. Thus, the restaurant subsectors served as historical baselines of how smoking bans have affected other service subsectors in North Dakota. Second, by analyzing the restaurant subsectors, we also gained information on seasonality trends which occur in North Dakota's service subsectors and how these correlated with other service subsectors such as Drinking Places. In order to gather information on these various NAICS codes, we used taxable sales and purchases data from the Accommodation and Food Services sector (72) and the various NAICS subsectors made available to us by the North Dakota Office of State Tax Commissioner.

- Taxable sales and purchases information was available for Fargo, West Fargo, Grand Forks, Grand Forks County, and Cass County from the first quarter of 2002 through the third quarter of 2009. In order to utilize comparable state-level data, most of our analysis is restricted to quarterly data beginning in the fourth quarter of 2004.

- The taxable sales and purchase information obtained from the North Dakota Office of State Tax Commissioner was then converted into 2009 dollars using Consumer Pricing Index (CPI) tables in order to allow us to compare information over an extended period of time without the data being skewed by dollar value.

- At the time of this study, the city of Grand Forks did not have a comprehensive smoking ban, except on the University of North Dakota campus. Therefore, Grand Forks' primary role in this study was as a benchmark as a city in North Dakota which still allowed smoking in bars and truck stops and had similar characteristics to the cities in our study (e.g., location, economic diversity, and a large educational community). In addition, the city of Grand Forks comprises the majority of taxable sales and purchases in the county in which it resides, Grand Forks County.

- We analyzed Grand Forks using the same criteria which we used in our analyses of Fargo and West Fargo. Our approach was to analyze the NAICS code subsectors of Full-service Restaurants (722110), Limited-service Restaurants (722211), and Drinking Places (722410) as a percentage of the overall NAICS code sector in which they resided, Sector 72 (Accommodation and Food Services). We also looked for quarterly changes and trends which existed in the taxable sales and purchases related to these service subsectors.

The results of our analysis for Full-service Restaurants, Limited-service Restaurants, and Drinking Places for our benchmark city Grand Forks, and for the cities which are the focus of our study – Fargo and West Fargo – is next, followed by our overall conclusions.

Full-service Restaurants (722110)

- **Grand Forks** – Full-service Restaurants have steadily increased in taxable sales and purchases. The greatest quarterly decrease in taxable sales and purchases occurred in Q4 2004 through Q1 2005, which corresponded with Fargo's sharpest quarterly decline. This decline, however, did not correspond to the passing of North Dakota's smoke-free law. In addition, taxable sales and purchases in Grand Forks have increased by 23.94 percent from Q4 2004 through Q3 2009. These findings offer objective evidence that the statewide smoke-free law had no demonstrable economic effect on Grand Forks' long-term taxable sales and purchases from Full-service Restaurants. We used vertical analysis procedures to examine Grand Forks' contributions from Full-service Restaurants as a percentage of North Dakota's Accommodation and Food Services sector. Our findings indicate that the relative contribution has not changed greatly from the end of 2004 until the end of 2009. Since Grand Forks' taxable sales and purchases have increased, yet contributions as a percentage of North Dakota's Accommodation and Food Services sector have remained relatively steady, we know that the service sector as a whole has been increasing. Since the North Dakota smoke-free law would affect this subsector equally throughout the state, yet this subsector is still increasing even after the banning of smoking in Full-service Restaurants, we are confident concluding that the 2005 smoke-free law has had no long-term economic effects on the Full-service Restaurants subsector in Grand Forks.

- **Fargo** – In Fargo, just as in our benchmark city of Grand Forks, we found that the quarter of sharpest decline in taxable sales and purchase occurred from the fourth quarter of 2004 through the first quarter of 2005, which did not correspond with the passing of the North Dakota smoke-free law. We also found this subsector to be increasing in taxable sales and purchases just as in Grand Forks, and it remained very steady in its contributions as a portion of North Dakota's Accommodation and Food Services sector. Similar to Grand Forks, Fargo did not experience an economic impact that could be attributed to the statewide smoke-free law. Instead, its taxable sales and purchases for Full-service Restaurants steadily increased in the years following the implementation of the smoke-free law.

- **West Fargo** – We were surprised to learn that the sharpest decline in taxable sales and purchases from Full-service Restaurants in West Fargo occurred in a quarter which did not correspond with the other cities we analyzed. West Fargo experienced the least growth in this subsector of the three cities we analyzed. West Fargo has also declined in this subsector as a portion of North Dakota's Accommodation and Food Services sector. This suggests that the sector overall has been increasing at a quicker rate than taxable sales and purchases for West Fargo's Full-service Restaurants taxable sales and purchases have. Nonetheless, the declines did not correspond to the statewide smoke-free law. Therefore, we concluded that there was no demonstrable economic impact in West Fargo due to the statewide law.

Limited-service Restaurants (722211)

- **Grand Forks** – Limited-service Restaurants in the city of Grand Forks have slightly decreased in taxable sales and purchases. The greatest decrease in taxable sales and purchases from one quarter to the next occurred in Q4 2004 through Q1 2005, which did not correspond with the passing of North Dakota's smoke-free law. The smoke-free law had no demonstrable effects on Grand Forks' long-term taxable sales and purchases from Limited-service Restaurants. We conclude this due to the fact that Grand Forks has only had a small decline in its taxable sales and purchases related to the Limited-service Restaurant subsector and this decline is due more to seasonality trends than to a steady decline in this subsector. This subsector has failed to maintain the rate of growth of the Accommodation and Food Services sector in North Dakota but has not declined, except for seasonal trends, since the passing of the smoke-free law.

- **Fargo** – Fargo's sharpest quarterly decline in taxable sales and purchases in the Limited-service Restaurants sector was in Q4 2004 through Q1 2005, similar to Grand Forks. This does not correspond to the 2005 statewide smoke-free law, thus no direct impact of this law is evident. Unlike Grand Forks, this subsector is growing in Fargo. However, similar to Grand Forks, it has declined in the percentage of contributions provided by this subsector to North Dakota's overall Accommodation and Food Services sector. Thus, while the Limited-service Restaurant subsector is growing in Fargo, it is growing at a slower rate than the rest of the service sector statewide.

- **West Fargo** – Like Full-service Restaurants, the sharpest decline in taxable sales and purchases did not correspond with the other two cities. Even as the Limited-service Restaurant subsector in West Fargo was growing, its proportion of North Dakota's Accommodation and Food Services sector has declined. This once again lends credence to the notion that this subsector is not increasing at the same rate as the rest of the service sector. What is of specific interest, however, is that no evidence was found that the statewide smoke-free law had an impact on West Fargo's Limited-service Restaurants.

Drinking Places (722410)

Drinking Places was the key subsector for our study. Our analysis was based on the assumption that if the Fargo and West Fargo smoking bans had an economic impact on the Drinking Places subsector in these cities, their trend lines would diverge from Grand Forks. This is exactly what we found.

- **Grand Forks** – The quarter of largest decline in Grand Forks for Drinking Places was the Q4 2004 through Q1 2005. The timing of this decline corresponded with the sharpest decline of the other service subsectors, pointing to some macroeconomic effect happening during this time which affected all of the North Dakota service subsectors we examined. More importantly, we found only a modest decline in Grand Forks' taxable sales and purchases in its Drinking Places subsector from Q2 2008 through Q3 2008. This is the period when the comprehensive smoking bans in Fargo and West Fargo took place. In addition, Grand Forks' contributions as a percentage of North Dakota's Accommodation and Food Services sector did not change greatly from normal seasonality trends during this quarter; this trend diverged from that of Fargo and West Fargo. We also found Grand Forks' taxable sales and purchases related to Drinking Places have been declining since 2004 as have the percentage these contributions make up of North Dakota's Accommodation and Food Services sector.

- **Fargo** – The focus of this study was on the economic impact of the Fargo and West Fargo comprehensive smoking bans. Unlike the Full-service and Limited-service Restaurant subsectors, which did not show a demonstrable impact from the 2005 statewide smoke-free law when that was implemented, Fargo's Drinking Places' did incur a short-term economic impact from the implementation of the 2008 city comprehensive smoking bans. The sharpest decline in Fargo's taxable sales and purchases from Drinking Places corresponded with the comprehensive smoking bans that were passed (i.e., Q2 2008 – Q3 2008). In contrast, no corresponding significant decline in Drinking Places was found in Grand Forks. This indicates an economic impact did occur due to the ordinances in this subsector. However, the impact was short-term since the subsector has seen growth following the passing of the smoking bans.

- **West Fargo** – When we analyzed West Fargo's Drinking Places' taxable sales and purchases, we found the same general pattern shown by Fargo's data. While the data revealed that West Fargo's sharpest decline in taxable sales and purchases did not corresponded with the passing of the comprehensive smoking bans, there was a significant decline corresponding to the implementation. This suggests that West Fargo bars also incurred a negative economic impact as a result of the comprehensive smoking bans. Surprisingly, West Fargo experienced its largest quarter of taxable sales and purchases after the comprehensive smoking bans were implemented, so we can conclude that the impact of the smoking bans was short-lived.

Conclusions

West Fargo's results were consistent with Fargo's results. While Grand Forks experienced a small decline in taxable sales and purchases for Drinking Places from Q2 2008 – Q3 2008, West Fargo experienced a sharp decline. West Fargo also had a larger change in the percentage of contributions of North Dakota's Accommodation and Food Services sector than experienced by Grand Forks. Based on our analysis, we can conclude that the sharper decline in taxable sales and purchases experienced by Fargo and West Fargo was caused by the passing of the comprehensive smoking bans. We also know that the effect was short-term and that the growth West Fargo was experiencing prior to the passing of the smoking bans has resumed.

Table 13 provides data for the sharpest quarterly decline and overall changes in taxable sales and purchases for the cities, state, sector, and subsectors we analyzed in this study.

Table 13. Sharpest Quarterly Decline in Taxable Sales and Purchases and Overall Change in Taxable Sales and Purchases for all Subsectors and Geographies, for Study Period Q4 2004 – Q3 2009

Geography		NAICS Sector or Subsector (NAICS Code)	Percentage Change in Taxable Sales and Purchases: Sharpest Quarterly Decline (Period of Occurrence)	Percentage Change in Taxable Sales and Purchases: Short-Term Change Corresponding to Implementation of City Smoking Bans (Q2 2008 – Q3 2008)	Percentage Change in Taxable Sales and Purchases: Change for Study Period (Q4 2004 – Q3 2009)
North Dakota		Accommodation and Food Services Sector (72)	-10.89% (Q4 2004 – Q1 2005)	6.74%	26.62%
Grand Forks	Subsector	Full-service Restaurants (722110)	-8.32% (Q4 2004 – Q1 2005)	1.55%	23.94%
		Limited-service Restaurants (722210)	-12.76% (Q4 2004 – Q1 2005)	1.65%	-2.46%
		Drinking Places (722410)	-10.61% (Q4 2004 – Q1 2005)	-0.54%	-20.71%
Fargo	Subsector	Full-service Restaurants (722110)	-7.16% (Q4 2004 – Q1 2005)	-2.86%	11.85%
		Limited-service Restaurants (722210)	-8.63% (Q4 2004 – Q1 2005)	3.23%	19.04%
		Drinking Places (722410)	-10.20% (Q2 2008 – Q3 2008)	-10.20%	26.15%
West Fargo	Subsector	Full-service Restaurants (722110)	-13.40%* (Q1 2007 – Q2 2007)	-2.78%	2.79%
		Limited-service Restaurants (722210)	-12.08% (Q3 2006 – Q4 2006)	1.28%	6.64%
		Drinking Places (722410)	-16.69% (Q4 2006 – Q1 2007)	-15.04%	123.02%

*This is the sharpest quarterly decline during our study period for the Full-service Restaurant subsector in West Fargo. The Q3 2004 – Q4 2004 decline (-17.56%) was greater, but since Q4 2004 is the start of our study period, the change between Q3 2004 – Q4 2004 was not used.

Section 2: Regression Analysis of Tax Data

METHODOLOGY

In Section 2: Regression Analysis of Tax Data, we analyzed Fargo and West Fargo looking for the effect which our primary variable, the Fargo and West Fargo comprehensive smoking bans, had upon the Drinking Places subsector within these two cities. Section 2 utilizes the taxable sales and purchases data obtained from the North Dakota Office of State Tax Commissioner, as did Section 1, and are organized by their North American Industry Classification System (NAICS) code. These data were filed by Full-service Restaurants (NAICS code 722110), Limited-service Restaurants (NAICS code 722211), and Drinking Places (NAICS code 722410) in the city of Fargo, the city of West Fargo, Cass County, and the state of North Dakota. Data from the Accommodation and Food Services sector (NAICS code 72) were also used. In this section we drew from another Minot economic study, *The Economic Impact of Minot's Smoke-Free Restaurant Ordinance*, released May 2003.

We chose regression analysis as another means for examining the tax data because it directly met Siegel's third criteria for a quality study (i.e., use of statistical methods that control for time trends and random events). Regression analysis is a statistical technique that investigates the relationship between variables. The primary advantage of using regression analysis is that it allows users to measure the effect that one variable has upon another, whether a positive or negative effect, or an extreme or minor effect. Regression analysis provides an understanding of the relationship between variables as well as the degree of confidence in the relationship between those variables (*Simple linear regression analysis*, 2008). In this study, regression analysis was used to measure the effect that the smoking bans had on taxable sales and purchases in the Restaurant and Drinking Places subsectors.

Regression provides us the ability to control for alternative explanations. However, regression is not as robust of a measure in this study because we have only 20 data points (i.e., quarters). Nonetheless, regression provides us the ability to assess causal analysis and control for alternative explanations such as market share. We were concerned with significant changes over time so the regression analysis measured the significance of the comprehensive smoking bans based on the change between the periods of Q4 2004 – Q2 2008 and when the smoking bans were in effect from Q3 2008 – Q3 2009.

Our dependent variable was the proportion that the taxable sales and purchases for NAICS subsectors 722110, 722211, or 722410 in Fargo or West Fargo was of the overall statewide Accommodation and Food Services sector (NAICS 72). Our dependent variable controls for underlying economic conditions and looks at the relative strength of taxable sales and purchases in our areas of study relative to the state overall. For example, changes in large-scale patterns of buying may have had an impact on the bars, thus we needed to control for this possibility. Regression analysis offers a statistical procedure to control for these alternative possibilities.

Our independent variables included quarters (to control for issues of seasonality), time (20 data points represented the annual rate of change in the dependent variable each quarter), and whether the ordinances were in place (0 is no ordinances and 1 is the ordinances). An additional variable was also analyzed representing market share (Fargo's and West Fargo's quarterly share of Cass County's taxable sales and purchases, for each subsector).

REGRESSION ANALYSIS OF TAX DATA

In our regression analysis, we tested each model for significance; all of the models showed significance using ANOVA $p < .05$. We also ran three independent tests of multicolinearity. Multicolinearity is when two or more independent variables are highly correlated. This is a concern in regression analysis because it may affect calculations within the regression model. Our first test was inter-correlations between the independent variables. All of the inter-correlations except for one were below .8, which is the typical threshold for multicolinearity. The other two standard tests of multicolinearity were tolerance and variance inflation factor (VIF); the threshold for multicolinearity using tolerance is less than .1 and the threshold for multicolinearity for VIF is 10. Our data did not exceed those thresholds; our coefficients for tolerance were all .1 or greater and VIFs were all below 10. Therefore, based on these three tests, we conclude no multicolinearity existed in our regression models. In the case where the inter-correlation was above .8, the more robust measures of tolerance and VIF failed to show multicolinearity, so we are confident that there was not multicolinearity in that model either.

Fargo

- **Full-service Restaurants** – The ordinances did not have a significant impact on the proportion of taxable sales and purchases for Fargo's Full-service Restaurants relative to the overall statewide Accommodation and Food Services sector, $b = -.002$, $t(19) = -1.874$, $p = .082$.
- **Limited-service Restaurants** – The ordinances did not have a significant impact on the proportion of taxable sales and purchases for Fargo's Limited-service Restaurants relative to the overall statewide Accommodation and Food Services sector, $b = -.009$, $t(19) = -.055$, $p = .957$.
- **Drinking Places** – The ordinances showed a significant impact on the proportion of taxable sales and purchases for Fargo's Drinking Places, $b = -.784$, $t(19) = -2.955$, $p = .010$. However, when we included the variable on market share, the variable no longer was significant, $b = .885$, $t(19) = .428$, $p = .675$. Thus, the trend in market share was viewed by the model as more important than the existence of the ordinances. In the absence of market share, it appeared that the ordinances were explaining the difference. However, when controlling for market share, the impact of the ordinances disappeared.

West Fargo

- **Full-service Restaurants** – The ordinances did not have a significant impact on the proportion of taxable sales and purchases for West Fargo's Full-service Restaurants relative to the overall statewide Accommodation and Food Services sector, $b = .088$, $t(19) = .502$, $p = .624$.
- **Limited-service Restaurants** – The ordinances did not have a significant impact on the proportion of taxable sales and purchases for West Fargo's Limited-service Restaurants relative to the overall statewide Accommodation and Food Services sector, $b = -.010$, $t(19) = -.051$, $p = .960$.
- **Drinking Places** – The ordinances showed a significant impact on the proportion of taxable sales and purchases for West Fargo's Drinking Places, $b = .616$, $t(19) = 2.841$, $p = .013$. However, when we included the variable on market share, the variable no longer was significant, $b = -.070$, $t(19) = -.725$, $p = .481$. Thus, the trend in market share was viewed by the model as more important than the existence of the ordinances. In the absence of market share, it appeared that the ordinances were explaining the difference. However, when controlling for market share, the impact of the ordinances disappeared.

Market share points to the idea that competition was occurring for bar customers concurrent with the implementation of the ordinance. The shifting market share between the two cities is illustrated in Table 14. While Fargo's proportion of drinking places' taxable sales and purchases within Cass County has decreased, it had been decreasing since before the comprehensive smoking bans. In addition, Fargo's proportion began decreasing when West Fargo's Drinking Places' taxable sales and purchases proportion began increasing. In the absence of controlling for shifting market share between Fargo and West Fargo, the regression analysis found a significant impact in each city due to the comprehensive smoking bans. However, if one takes into consideration the trend in shifting market share between the two cities, the impact represented by the downward spike in taxable sales on Fargo's Drinking Places is likely due to West Fargo drawing business away from Fargo and not an impact of the ordinances.

Table 14. Market Share: Fargo and West Fargo's Taxable Sales and Purchases for Drinking Places (722410) as a Proportion of Cass County's Taxable Sales and Purchases for Drinking Places, Q4 2004 – Q3 2009

Quarter	Market Share (Proportion of Cass County's Taxable Sales and Purchases for Drinking Places)		
	Fargo and West Fargo Combined	Fargo Alone	West Fargo Alone
Q4 2004	86.93%	79.90%	7.02%
Q1 2005	87.91%	80.59%	7.31%
Q2 2005	88.04%	81.47%	6.57%
Q3 2005	89.33%	83.40%	5.93%
Q4 2005	89.88%	84.14%	5.74%
Q1 2006	90.36%	84.32%	6.04%
Q2 2006	89.93%	83.75%	6.18%
Q3 2006	90.32%	85.16%	5.16%
Q4 2006	90.74%	86.49%	4.24%
Q1 2007	90.90%	87.13%	3.78%
Q2 2007	90.11%	85.99%	4.12%
Q3 2007	90.44%	85.52%	4.92%
Q4 2007	90.63%	82.88%	7.75%
Q1 2008	90.54%	82.59%	7.95%
Q2 2008	90.76%	79.61%	11.15%
Q3 2008*	88.57%	78.21%	10.36%
Q4 2008	89.69%	77.23%	12.45%
Q1 2009	89.24%	77.66%	11.58%
Q2 2009	89.93%	78.12%	11.81%
Q3 2009	89.52%	77.48%	12.04%

*The Fargo and West Fargo comprehensive smoking bans became effective July 1, 2008 (Q3 2008).

There are some important limitations with regression analysis. The most important concern in our case is the relatively small number of data points after the implementation of the ordinances. This paucity of data is compounded by the relatively fast rebound in taxable sales and purchases in both cities. The regression modeling procedure, therefore, is attempting to make sense of a short-term trend after the implementation of the ordinances (i.e., only 5 quarterly data points) which includes a possible one quarter correction (or impact). Nonetheless, the findings appear to be consistent with an explanation of shifting market share. For example, prior to introducing market share as an independent variable in the regression equation, the beta weight for the ordinances in Fargo was negative (b = -.784) which means that with the implementation of the ordinances, the trend in Fargo's taxable sales was downward. In contrast, the beta weight for the ordinances in West Fargo's regression equation was positive (b = .616) which means that with the implementation of the ordinances, the trend in West Fargo's taxable sales was upward.

The apparent contradiction between conclusions reached by the regression analysis once the variable on market share is included (i.e., that the ordinances had no impact) and those from the previous section regarding horizontal and vertical analysis (i.e., that there was a short-term economic impact of quarterly taxable sales and purchases data with an immediate recovery the next quarter for both cities) are intriguing. The horizontal and vertical analysis of the taxable sales and purchases data is unable to control for shifting market share between Fargo and West Fargo (i.e., that competition was occurring for bar customers concurrent with the implementation of the ordinance). However, it is more able to discern a very short-term impact. In contrast, regression analysis is less sensitive to short-term impacts and is, instead, capturing the longer-term trend.

SUMMARY

The regression analysis indicates that a significant shift in market share between Fargo and West Fargo may account for the downward trend in taxable sales and purchases found in the analysis. To confirm this, we looked at contributions from both cities to Cass County's Drinking Places. We found that the proportion of contributions provided by the two cities together has not altered significantly since the passing of the comprehensive smoking bans. This means that Fargo and West Fargo combined contributed roughly the same proportion of Drinking Places' taxable sales and purchases to Cass County before and after the smoking bans. However, Table 14 confirms our analysis that West Fargo's proportion of Cass County's Drinking Places' taxable sales and purchases has been increasing since the second quarter of 2008 and Fargo's proportion has been decreasing since then. This accounts for the significant regression analysis correlation between Fargo, West Fargo, and the comprehensive smoking bans when we only used the initial variables of quarters, time, and whether the ordinances were in place. When market share was controlled (i.e., entered into the equation as an independent variable,) the impact of the ordinances were no longer significant. However, one needs to keep in mind that the regression analysis is not very sensitive to a very short-term impact.

Section 3: Survey of Bar Employees

INTRODUCTION

This survey is the third component of a larger project aimed at analyzing the economic impact of the comprehensive smoking bans implemented in Fargo and West Fargo on July 1, 2008. The purpose of this survey was to examine perceived shifts within businesses that may have occurred as a result of the ordinances. These include such things as changes in advertising, promotions, or possible internal adjustments (e.g., salary or wage changes) that were made to increase revenues.

The strength of Section 3 is that the survey uses employees within establishments to offer insight regarding changes that occurred in the last two years in the respondent's establishment. This timeframe corresponds to the comprehensive smoking bans taking effect. It also reflects a recessionary economic period. We did not ask respondents what they think is the cause of changes; we wanted the data to speak to the changes without introducing potential bias based on respondent's perceptions of the cause of those changes. In addition, we do not know if the employees' perceptions match the financial realities of the establishment.

METHODOLOGY

A list of liquor establishments in Fargo and West Fargo was obtained from Fargo-Cass Public Health. We then implemented a four-stage stratified sample for this study. First, establishments were stratified by city (i.e., Fargo and West Fargo). Next, we stratified by size of establishment (i.e., number of employees). Establishments with 20 or more employees in Fargo and 15 or more employees in West Fargo were categorized as large. Establishments with fewer employees were categorized as small. We then stratified by time of day (i.e., day versus evening) and by day of the week (i.e., weekday versus weekend). Randomly selected establishments were then selected based on the four stratifications. Data collection took place from April 7 – April 30, 2010.

Staff from the North Dakota State Data Center (NDSDC) met with managers from each of the selected establishments (based on stratification criteria), asked for permission to survey employees, and when possible, hand-delivered survey packets to each of the employees on that specific shift. Employees were given a brief explanation of the project and instructed to complete the survey on their own time. The survey packet included the survey, a cover letter, and a postage-paid, self-addressed return envelope. A total of 324 surveys were delivered; 105 to small establishments (i.e., fewer than 20 employees in Fargo or 15 employees in West Fargo) and 219 to large establishments. A total of 38 surveys were returned from small establishments for a response rate of 36 percent. Among large establishments, 51 were returned for a response rate of 23 percent. The overall response rate was 27 percent. This response rate ensures that we can be 90 percent confident the error is no more than 7.5 percent.

In our analysis of the survey data, we looked at frequency distributions and means. We also conducted significance testing, which tests to see whether the distribution of responses differs from what normally should be expected. Chi-square tests and t-tests were run as appropriate on each of the survey questions by whether or not the respondent was a smoker and size of respondent's establishment. The distributions that revealed statistically significant differences at the $p<.05$ level are discussed in the narrative associated with each figure and reported in the appendix tables.

SURVEY RESULTS

Respondents were asked to indicate the level of change (if any) that had occurred within their establishment over the past two years (see Figure 26, Appendix Table 9).

- Overall, the majority of respondents indicated there was little or no change over the past two years with respect to their hourly wage/monthly salary (61.8 percent) and their scheduled number of hours per week (53.9 percent).

- Nearly half of respondents indicated little or no change in full-time employees (46.1 percent) over the past two years.

- However, nearly half of respondents indicated that tips decreased over the past two years (49.5 percent).

Significant findings (Appendix Table 9)

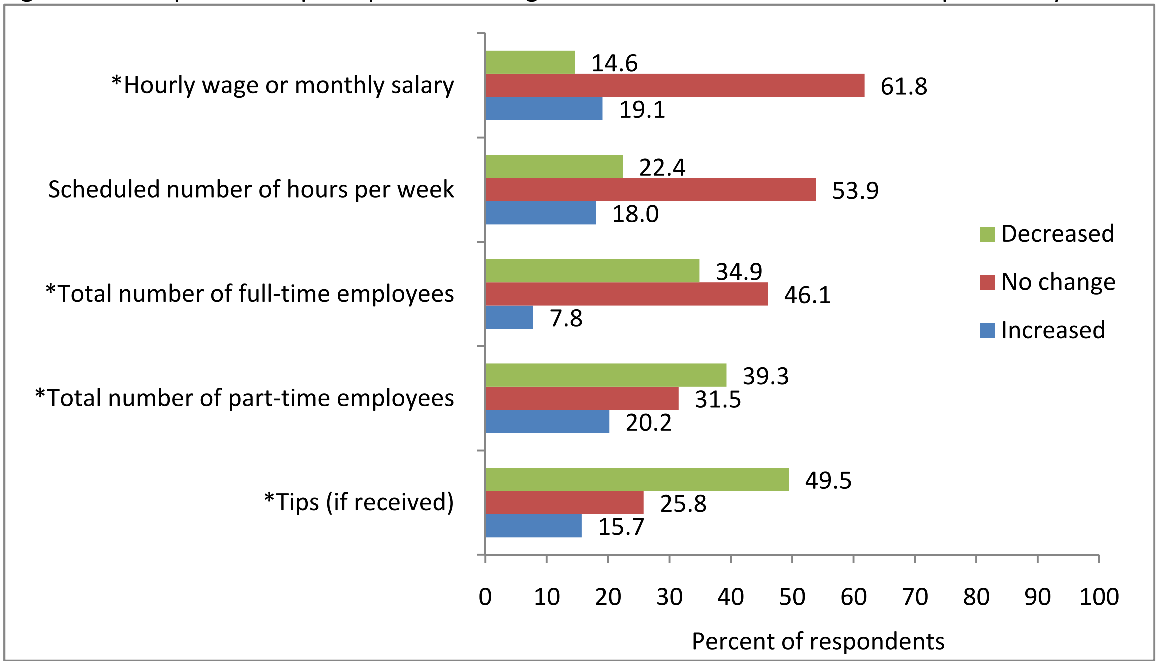
- Hourly wage or monthly salary – Respondents in small establishments were more likely than respondents in large establishments to say their hourly wage or monthly salary had greatly decreased (18.4 percent and 3.9 percent, respectively).

- Total number of part-time employees – Respondents in small establishments were more likely than respondents in large establishments to say the total number of part-time employees in their establishment had greatly decreased (28.9 percent and 5.9 percent, respectively).

- Total number of full-time employees – Respondents in small establishments were more likely than respondents in large establishments to say the total number of full-time employees in their establishment had greatly decreased (18.4 percent and 0.0 percent, respectively).

- Tips – Respondents in small establishments were more likely than respondents in large establishments to say their tips had greatly decreased (50.0 percent and 9.8 percent, respectively).

Figure 26. Respondents' perception of change within their establishment over past two years



N=89
*Significant at p<.05 level.

Respondents were asked if their establishment had adjusted various strategies (i.e. quality of product, menu offerings, advertising, and promotional marketing strategies) over the past two years (see Figure 27, Appendix Table 10).

- Overall, the vast majority of respondents said there was no change in the quality of product in their establishment over the past two years (77.9 percent); 12.8 percent said the quality of product decreased.

- Overall, the majority of respondents said menu offerings in their establishment did not change over the past two years (56.8 percent); 23.9 percent said menu offerings increased.

- Overall, nearly half of respondents said there was no change in advertising over the past two years (47.7 percent); 30.2 percent said advertising had increased.

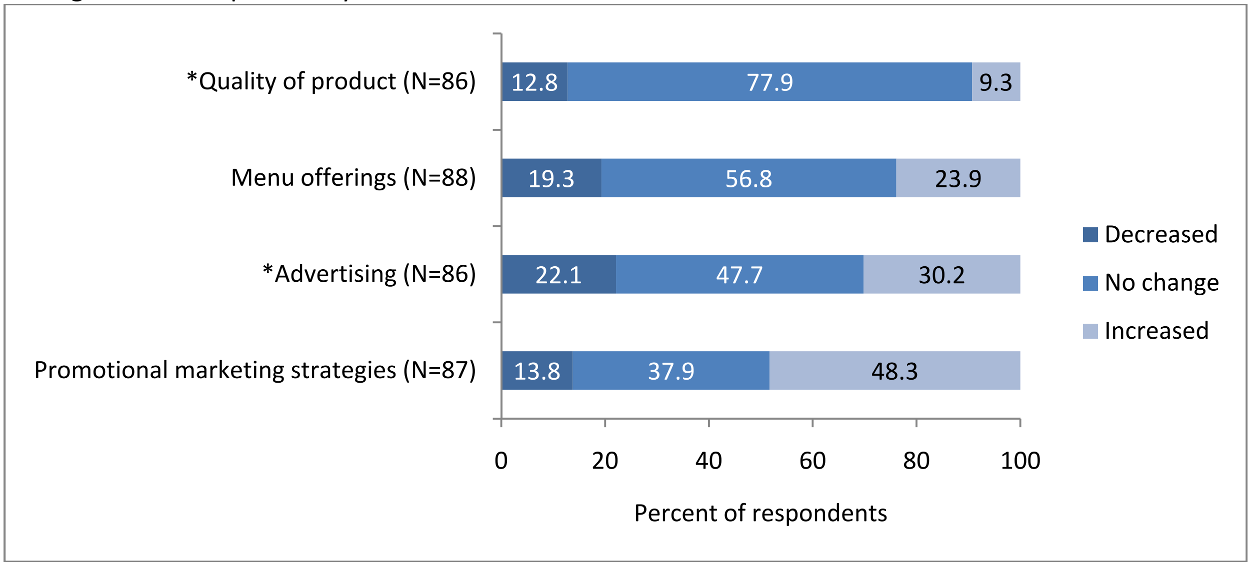
- Overall, nearly half of respondents said their establishment had increased promotional marketing strategies over the past two years (48.3 percent); 37.9 percent indicated there was no change.

Significant findings (Appendix Table 10)

- Quality of product – Respondents in small establishments were more likely than respondents in large establishments to say their establishment had decreased the quality of product (23.7 percent and 4.2 percent, respectively).

- Advertising – Respondents who were smokers were more likely than nonsmokers to say their establishment had not changed advertising strategies (62.2 percent and 31.7percent, respectively). Nonsmokers were more likely than smokers to say their establishment had increased advertising (43.9 percent and 17.8 percent, respectively).

Figure 27. Respondents' perception regarding whether there were changes in various business strategies over the past two years



*Significant at p<.05 level.
Note: In some cases, respondents indicated decreases, no change, and increases in "other" strategies on their survey, but did not specify what the strategies were.

Respondents were asked to offer their opinions of what changes, if any, had occurred with the clientele that have frequented their establishments over the past two years (see Figure 28, Appendix Table 11).

- The majority of respondents perceived a loss of patrons over the past two years (61.8 percent).

- Respondents perceived that the largest losses were among the working class and "regulars." Half of respondents indicated a decrease in the number of working class (50.6 percent) and 44.9 percent indicated a decrease in local regulars.

- The majority of respondents said there was no change in professional patrons over the past two years (53.9 percent).

Significant findings (Appendix Table 11)

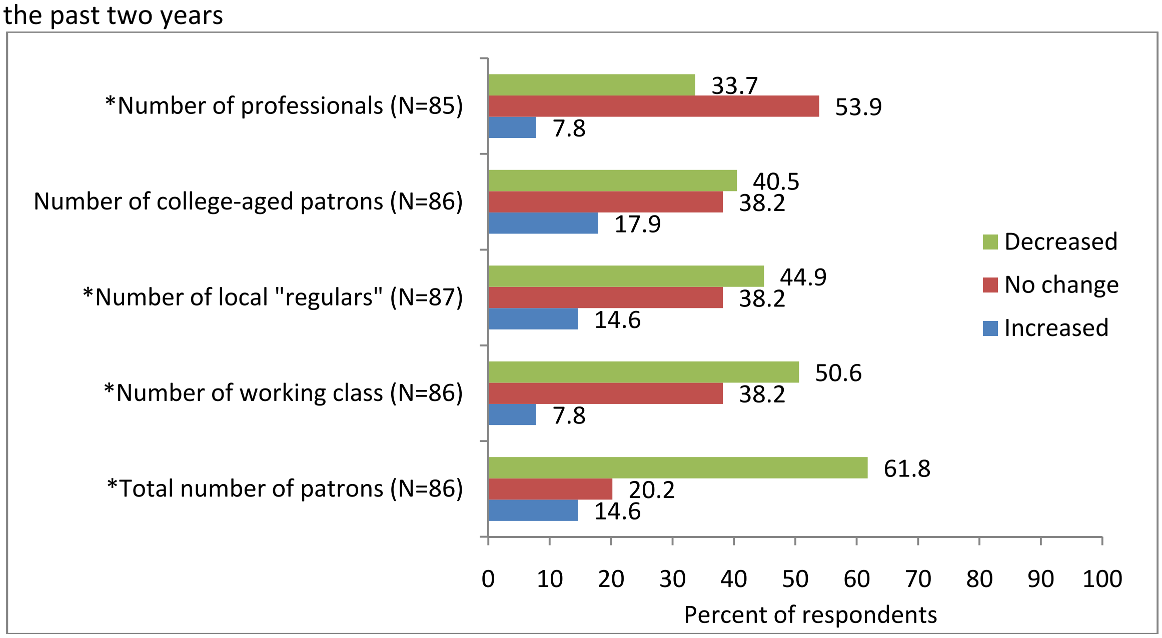
- Number of professionals – Respondents in small establishments were more likely than respondents in large establishments to say the number of professionals in their establishment had greatly decreased (26.3 percent and 2.0 percent, respectively).

- Number of local regulars – Respondents in small establishments were more likely than respondents in large establishments to say the number of local “regulars” in their establishment had greatly decreased (36.8 percent and 7.8 percent, respectively). Respondents who were smokers were more likely than nonsmokers to say the number of local “regulars” had greatly decreased (28.3 percent and 12.2 percent, respectively).

- Number of working class – Respondents in small establishments were more likely than respondents in large establishments to say the number of working class in their establishment had greatly decreased (50.0 percent and 9.8 percent, respectively).

- Total number of patrons – Respondents in small establishments were more likely than respondents in large establishments to say the total number of patrons in their establishment had greatly decreased (52.6 percent and 9.8 percent, respectively).

Figure 28. Respondent’s perception of whether there were changes in the number of clientele over the past two years



*Significant at p<.05 level.

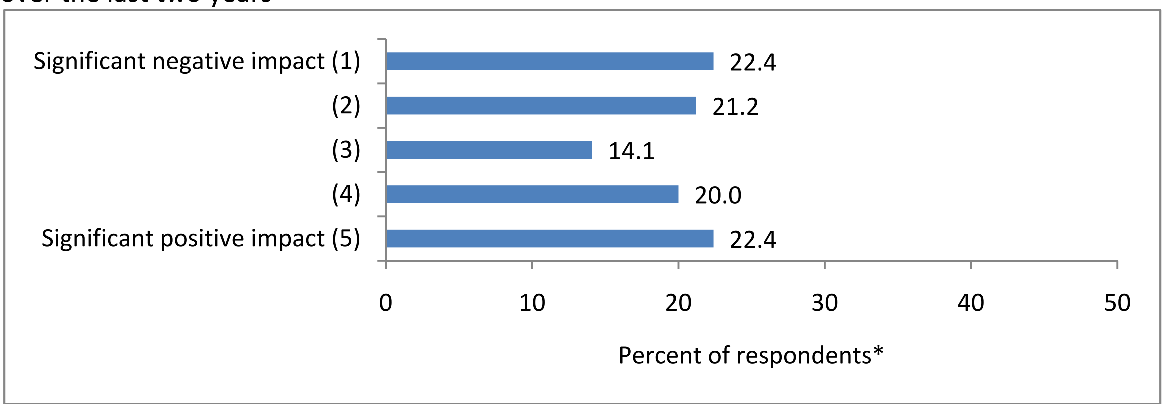
Respondents were asked to indicate whether or not they thought the smoking ordinances had an impact on the working environment within their establishment over the last two years (see Figure 29, Appendix Table 12).

- Similar proportions of respondents indicated a negative and positive impact on their working environment over the past two years (43.6 percent and 42.4 percent, respectively).

Significant findings (Appendix Table 12)

- Respondents in smaller establishments were more likely than respondents in large establishments to say the smoking ordinances had a significant negative impact on the working environment in their establishment over the past two years (45.9 percent and 4.2 percent, respectively). Respondents who were nonsmokers were more likely than smokers to say there had been a significant positive impact on the working environment over the past two years (34.1 percent and 11.4 percent, respectively).

Figure 29. Respondents' perception of impact of smoking ordinances on their working environment over the last two years



N=85
*Significant at p<.05 level.
Note: Mean=2.99 and was based on a one to five scale, with one being "significant negative impact" and five being "significant positive impact."

Respondents were asked about their support of the smoke-free ordinances when they took effect (July 1, 2008) and now, at this time (see Figure 30, Appendix Table 13). Means are based on a one to five scale with one being "not at all supportive" and five being "very supportive."

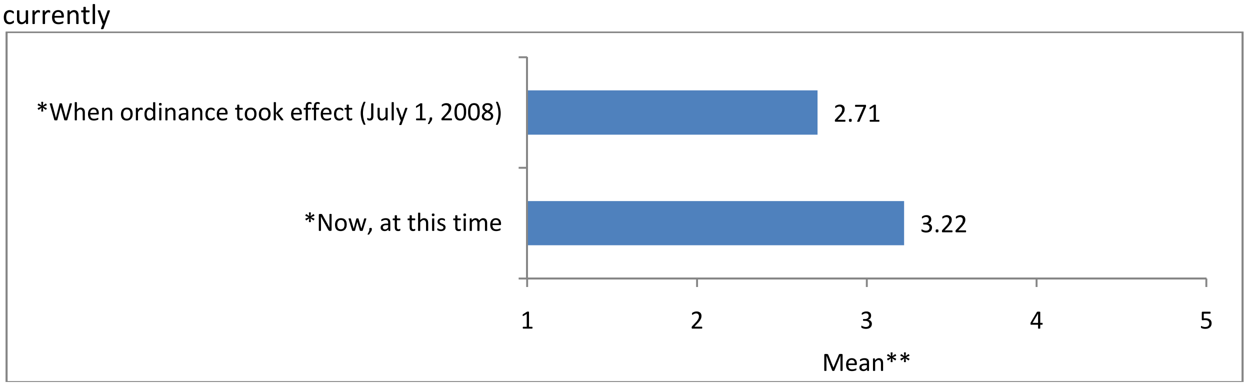
- Overall, respondents were more supportive of the smoke-free ordinances now than when they took effect on July 1, 2008 (mean=3.22 and mean=2.71, respectively).

Significant findings (Appendix Table 13)

- When the smoke-free ordinances took effect (July 1, 2008) – Respondents in small establishments were more likely than respondents in large establishments to say they were not at all supportive of the smoke-free ordinances (65.8 percent and 27.5 percent, respectively). Respondents who were nonsmokers were more likely than smokers to say they were very supportive of the ordinances when they took effect (41.9 percent and 17.4 percent, respectively). Conversely, smokers were more likely than nonsmokers to say were not at all supportive (54.3 percent and 32.6 percent, respectively).

- Now, at this time – Respondents in small establishments were more likely than respondents in large establishments to say they were not at all supportive of the ordinances (52.6 percent and 11.8 percent, respectively). It is worth noting that there were not significant differences in respondents' support of the ordinances based on smoking status at the time of the survey.

Figure 30. Respondents' support of smoke-free ordinances when they took effect on July 1, 2008, and currently



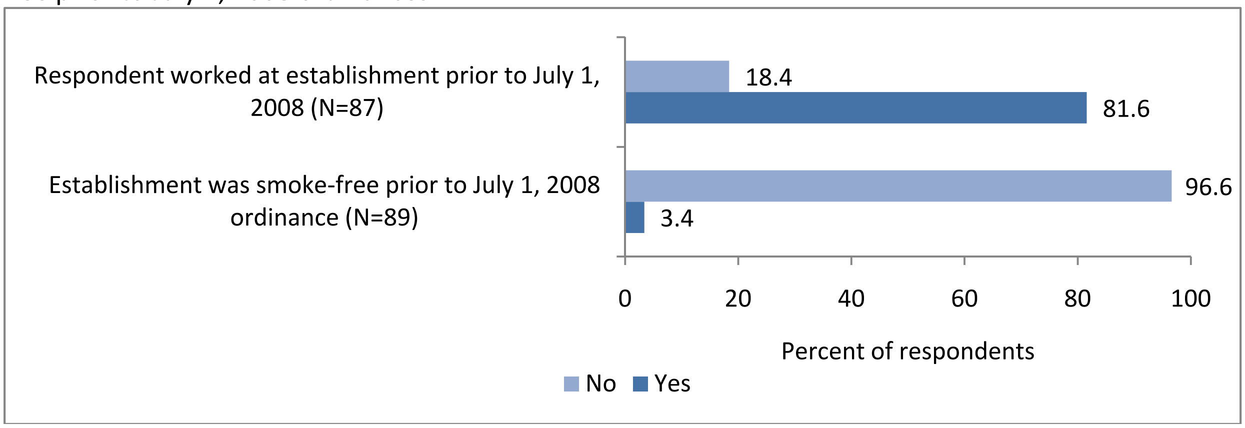
N=89
*Significant at p<.05 level.
**Means are based on a one to five scale, with one being "not at all supportive" and five being "very supportive."

Respondents were asked if they worked at their establishment prior to July 1, 2008 and if their establishment was smoke-free prior to the July 1, 2008 ordinances (see Figure 31, Appendix Table 14).

- Overall, the vast majority of respondents said they worked at their establishment prior to July 1, 2008 (81.6 percent).

- Overall, an overwhelming majority of respondents said their establishment was not smoke-free prior to the July 1, 2008 ordinances (96.6 percent).

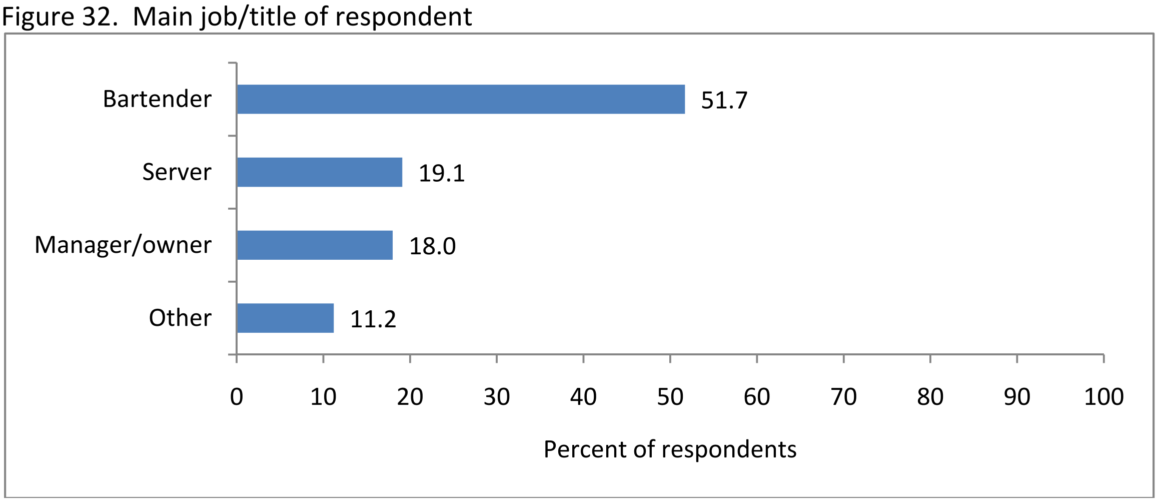
Figure 31. Whether respondent worked at their establishment and whether establishment was smoke-free prior to July 1, 2008 ordinances



Respondents were asked to indicate their main job/title (see Figure 32, Appendix Tables 15 and 15a).

- Overall, most respondents said their main job/title was bartender (51.7 percent); 19.1 percent said they were a server. See Appendix Table 7 for a list of "other".

Figure 32. Main job/title of respondent

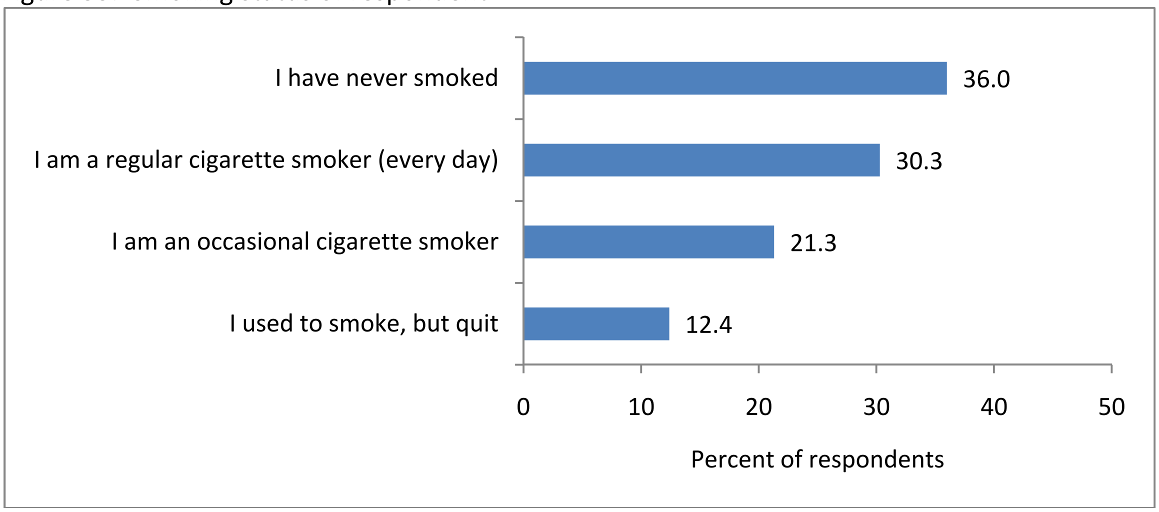


N=89

Respondents were asked to describe their smoking status (see Figure 33, Appendix Table 16).

- Overall, one in three respondents said they have never smoked (36.0 percent); 1 in 10 said they used to smoke, but quit (12.4 percent).
- Overall, most respondents said they are a cigarette smoker (51.6 percent); 30.3 percent said they smoke every day.

Figure 33. Smoking status of respondent



N=89

Comments

Respondents were given the opportunity on the survey to provide additional comments, which are organized by size of establishment. More respondents from small establishments chose to provide comments; these comments are divided into those that are in support of the comprehensive smoking bans and those that are not (see Table 15). Comments from respondents from large establishments were more positive or mixed (see Table 16).

Table 15. Comments by respondents in small establishments

Small establishments
Comments in support of ordinances
Being a musician I used to be "forced" to DJ, sing and play in smoky bars and inhale the dangerous toxins. I appreciate being healthy and being able to pursue my talents/craft. Smoking affects musicians!
I do enjoy working in a smoke-free environment, but our sales have dramatically decreased.
It's great to have the bar smoke free. I do not want to breathe it. If it's that big of a deal they can go outside. It has slowed down by probably 50% though.
Comments against ordinances
No other cities in N.D. have followed suit. Are we so much smarter than they are? No wonder the rest of the state hates Fargo.
It hurt the ones of us that had (have) no exterior area for an outdoor patio - no options for us. Should have been the whole state, so it wouldn't have impacted us in West Fargo & Fargo as much - unfair. Outside area bars flourished, we suffered.
I have worked in the same bar for 18 years in Fargo and it was my choice to work in a smoking environment. I cannot believe that this "city ordinance" passed. Unreal! If you don't like smoking - stay home – it should have been up the individual owner to decide.
I don't understand why a non-smoker cannot stay away from a smoking bar! It's like having exotic dancing in your establishment...how can you regulate someone else's livelihood...is it not the choice of a patron to enter an establishment such as a dancing club or a smoking bar? Then the law wants to control where the smokers can go to smoke, such as a cold shelter outside the bar. Why do they care where the smokers go as long as it's not in the public establishment itself?!
Employee's have the choice whether or not to work at the bar. No one is forcing them into it, so if they don't like the smoke they should work elsewhere. I don't know many bar employee's who are happy with the smoking ban.
Due to this smoking ordinance, my tips have reduced to half of what they were prior to the ban. I bartend for a living, am full time (40hours/5nights) and that's huge. Need a second part-time job, for the first time in the years doing this! (7years)
Does anyone realize that this ordinance only affects 22 businesses? Reason being is that all the others allow children and serve food so only establishments like the veteran clubs and "Blue collar" bars are affected. You have to be 21 to enter these premises and if the "patron" does not want to be exposed to smoke they have the choice to not enter.

Table 16. Comments by respondents in large establishments

Large establishments
Becoming smoke free at this job allowed me to continue working. Otherwise I would have soon begun looking for smoke free employment.
If smoking were allowed again I would not be in the bar business. Working in a restaurant that had a smoking section gave me asthma and ruined my clothes, hair and swimming career.
In addition to the smoking ban, the economy has played a major part in slower business. Patrons are going out later or happy hour regulars don't stay as long as they use to.
Money has decreased but I like the health benefit. All in all a good choice. Money isn't everything.
Thought the non smoking was going to hurt us, but don't think it has too much. I love it!!
We have not turned a profit since the smoking [ban] took effect. Don't know how much longer we can survive! We would not have survived this long had we not saved but we are eating up our savings.
[Regarding the impact on the working environment since the ordinance] Impacted more in winter - colder w/ door opening & shutting when people go to smoke.
I come to work to make money and if people are not coming because of not being able to smoke in our bar then I want something in the bar but I do like working in a smoke free environment. I think it should also be up to the owner of the bar because we are not forcing anybody into our establishment.

SUMMARY

1. Most respondents indicated that there were no changes in their salary and their scheduled number of hours over the past two years.
    - However, approximately half of respondents said there was a decrease in tips.
2. Most respondents said that there were no changes in the quality of product offered, menu offerings, and advertising within their establishments over the past two years.
    - However, nearly half of respondents indicated there was an increase in promotional marketing strategies.
3. The majority of respondents perceived a decline in the total number of patrons over the past two years.
    - Respondents perceived the largest losses in patrons to be among working class and "regulars."
    - The majority of respondents said there was no change among professionals.
4. Similar proportions of respondents perceived a positive and negative impact on their working environment since the comprehensive smoking bans took effect.
5. Respondents are more supportive of the comprehensive smoking bans now than when they took effect on July 1, 2008.
6. The vast majority of respondents reported they were working in their establishment prior to the time the ordinances took effect (July 1, 2008).
7. Most respondents said their main job/title was bartender.
8. Half of respondents said they are a cigarette smoker.

Overall, when viewing combined responses from all bar employees, the survey findings indicate there was very little or no perceived effect on establishments after the comprehensive smoking bans were implemented on July 1, 2008. However, when one looks at the findings by size of establishment, a different story emerges. The data tell us that employees in small establishments did perceive significant negative changes in the past two years. Significant differences in responses based on respondents' smoking status are also worth noting.

Compared to respondents in large establishments, **respondents in small establishments** were:

- More likely to say their hourly wage or monthly salary had *greatly decreased* in the past two years.
- More likely to say the total number of part-time and full-time employees in their establishment had *greatly decreased*.
- More likely to say their tips had *greatly decreased*.
- More likely to say their establishment had *decreased* the quality of product.
- More likely to say the total number of patrons, professionals, local "regulars", and working class in their establishment had *greatly decreased*.
- More likely to say there was a *significant negative impact* on the working environment of their establishment.
- More likely to say they were *not at all supportive* of the comprehensive smoking bans when they took effect on July 1, 2008 and of the comprehensive smoking bans now.

Compared to respondents who were nonsmokers, **smokers** were:

- More likely to say there was *no change* in advertising strategies.
- More likely to say the number of local "regulars" had *greatly decreased*.
- Less likely to say there was a *significant positive impact* on the working environment of their establishment.
- More likely to say they were *not at all supportive* of the comprehensive smoking bans when they took effect on July 1, 2008.

Survey results also suggest that resistance from employees in the bar industry has declined, even among those who were most resistant – smokers and those in small establishments. Prior to the ordinances, smokers were significantly less supportive of the legislation. Now, there is no longer a significant difference in support by smoking status. On average, levels of support for the ordinances have increased among bar employees.

Conclusions and Recommendations

CONCLUSIONS

In Section 1, we analyzed tax data pertaining to the cities of Fargo, West Fargo, and Grand Forks, as well as the counties of Cass and Grand Forks in North Dakota. We used horizontal and vertical analysis techniques in order to provide insight into any economic effects experienced by Fargo and West Fargo which could be directly linked to the passing of the comprehensive smoking bans that went into effect in these cities on July 1, 2008. Based on this approach we concluded that the comprehensive smoking bans had a short-term economic impact on the Drinking Places subsector but did not have long-term economic impacts.

In Section 2, we used regression analysis techniques in order to provide further insight into whether the passing of the comprehensive smoking bans in Fargo and West Fargo had a significant impact upon these cities. We did so by analyzing tax data and the following independent variables: quarters, time, whether the ordinances were in place, and market share. Based on this approach we concluded that, overall, the smoking bans had no significant long-term effect upon Fargo and West Fargo's Drinking Places. The regression analysis confirms our findings from Section 1's horizontal and vertical analysis.

In Section 3, we used a survey instrument in order to provide personal insight regarding the economic impact of the comprehensive smoking bans. When viewing the combined responses from all bar employees as a whole, survey findings indicate there was very little or no perceived changes in their establishments in the last two years. However, when one looks at the findings by size of establishment, the data tell us that employees in small establishments did indeed perceive significant negative changes in the past two years.

Survey results also suggest that resistance from employees in the bar industry has declined, even among those who were most resistant – smokers and those in small establishments. Prior to the ordinances, smokers were significantly less supportive of the legislation. Now, there is no longer a significant difference in support by smoking status. On average, levels of support for the ordinances have increased among bar employees.

The comprehensive smoking bans appear to be good public policy because they address an important public health issue (see Callinan et al., 2010) and our study has determined that, overall, the bans do not have a long-term negative economic consequence. Our conclusion echoes those formed by the vast majority of studies which have been conducted throughout the nation as well as with the Minot studies of the service subsectors.

We feel confident making this conclusion because we met all of Siegel's criteria for judging a quality study and our analysis reached the same conclusion the Minot studies reached in 2003 and 2007. Throughout our study's methodology, we tried to address any limitations which may have existed when using tax data. However, a few limitations still existed in this study.

Limitations Associated With This Study

Limitations associated with our study include reliance on tax data which only allowed us to analyze macroeconomic effects, conducting an economic study during a recession, and a short time frame for data (i.e., 20 data points).

- **Only Using Objective Data** – While objective tax data avoid personal feelings which may skew results and are based on observable facts, they fail to capture what is happening on a smaller scale. So while taxable sales and purchases have not been affected on a macroeconomic level, these data fail on a microeconomic level to measure changes such as wages, sales for specific bars, and other small-scale effects for individual businesses and employees. The objective data tell us that service industries will still thrive with smoking bans in effect, but they do not tell us which individual businesses may have less sales and which may have greater sales due to the implementation of smoking bans. We conducted a survey of bar employees in order to address the limitations of the tax data.

- **Conducting an Economic Study During a Recession** – Choosing a city with similar characteristics was the best means to control for this issue. With Grand Forks as a benchmark in this study, we can assume that any impacts from the recession on Fargo and West Fargo would be observed in Grand Forks' data. However, this assumption is not 100 percent accurate. There was no means to control for the differences in the recession's impacts on individual cities and local businesses.

- **Measuring Long-Term Economic Impact Based on One Year of Data** – Because this study analyzed three subsectors, two of which were subject to a previous smoke-free law passed nearly five years prior that did not generate an economic impact, we felt assured in our conclusion of the lack of a long-term economic impact in Fargo and West Fargo due to the comprehensive smoking bans.

RECOMMENDATIONS

Our horizontal, vertical, and regression analysis showed that the comprehensive smoking bans passed in Fargo and West Fargo did not have a significant long-term impact upon the cities. In addition, our survey data indicate that, when viewing the combined responses from all bar employees as a whole, there was very little or no perceived changes in their establishments in the last two years. We view these results as opportunities for change in an industry which felt it could not thrive without allowing smoking in its establishments. We offer the following recommendations for consideration.

1. Research should be undertaken to get a better understanding of how smoking bans affect different styles of bars so that individual bars with decreases in sales linked with smoking bans (which our study suggests is small bars) can identify changes that may be necessary for them to thrive in the new environment. We can infer that the majority of Drinking Places continue to thrive under smoke-free environments since the lack of a negative economic impact from smoking bans is found in the vast majority of studies conducted in city after city all around the nation (see Scollo et al., 2003). The key for individual businesses that are struggling is to help them understand and adapt to the new environment.

2. A research effort should be undertaken and data gathered to grasp the economic impact of the recession which began in December 2007 on the state of North Dakota. This information should be provided to communities so that they can use the data to understand the impact of the recession on different sectors in their communities (e.g., the economic impact of the recession on NAICS subsectors such as Drinking Places).

3. Studies similar to this one should be conducted at predetermined intervals in order to further understand long-term economic effects from smoking bans, which may in fact be positive. It would be recommended to revisit this study at 5 and 10 years out from the passing of the smoking bans so that analysis of this information can also be conducted during a non-recessionary period and long after people have adjusted to the change in regulations.

4. Further studies should also be conducted on other variables which can have an impact on Drinking Places such as city population increases/decreases, unemployment rates, market fluctuations, psychological feelings of wealth, etc., so that a better understanding of the complex environment in which Drinking Places operate can be fully understood.

Appendices

APPENDIX TABLES

Section 1: Horizontal and Vertical Analysis of Tax Data

Appendix Table 1. Consumer Price Index – All Urban Consumers

Year	Annual Average	2009 CPI Inflator*
1990	130.7	1.6414
1991	136.2	1.5752
1992	140.3	1.5291
1993	144.5	1.4847
1994	148.2	1.4476
1995	152.4	1.4077
1996	156.9	1.3673
1997	160.5	1.3367
1998	163.0	1.3162
1999	166.6	1.2877
2000	172.2	1.2459
2001	177.1	1.2114
2002	179.9	1.1925
2003	184.0	1.1660
2004	188.9	1.1357
2005	195.3	1.0985
2006	201.6	1.0642
2007	207.3	1.0347
2008	215.3	0.9964
2009	214.5	1.0000

Source: Bureau of Labor Statistics
*The CPI and its components were used to adjust U.S. dollar values from previous years, dating back to 1913, and to translate these historic dollar values into inflation-free dollars for the year desired. In this study we adjusted dollar values ranging from 2002 – 2008 and adjusted them to inflation-free 2009 dollar values.

Appendix Table 2. North Dakota's Accommodation and Food Services Sector Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009

Quarter	North Dakota Accommodation and Food Services Sector Taxable Sales and Purchases, 2009 Dollars
Q4 2004	$254,156,354
Q1 2005	$226,478,004
Q2 2005	$255,163,547
Q3 2005	$273,548,762
Q4 2005	$256,503,810
Q1 2006	$236,419,356
Q2 2006	$258,684,452
Q3 2006	$282,228,858
Q4 2006	$267,463,142
Q1 2007	$244,248,478
Q2 2007	$268,898,967
Q3 2007	$298,371,745
Q4 2007	$285,167,726
Q1 2008	$256,449,471
Q2 2008	$292,342,273
Q3 2008	$312,053,719
Q4 2008	$285,169,849
Q1 2009	$264,325,562
Q2 2009	$299,303,956
Q3 2009	$321,805,728

Source: North Dakota Office of State Tax Commissioner

Appendix Table 3. Cass County's Full-service Restaurants, Limited-service Restaurants, and Drinking Places Subsectors Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009

	Taxable Sales and Purchases, 2009 Dollars					
	Cass County's Full-service Restaurants		Cass County's Limited-service Restaurants		Cass County's Drinking Places	
Quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter
Q4 2004	$30,785,094	-2.46%	$22,002,249	-4.23%	$7,110,463	8.54%
Q1 2005	$28,490,039	-7.46%	$20,029,686	-8.97%	$6,686,237	-5.97%
Q2 2005	$29,668,690	4.14%	$22,457,573	12.12%	$7,599,798	13.66%
Q3 2005	$29,394,267	-0.92%	$23,095,421	2.84%	$8,148,962	7.23%
Q4 2005	$29,931,198	1.83%	$22,649,136	-1.93%	$8,866,321	8.80%
Q1 2006	$30,190,638	0.87%	$20,936,998	-7.56%	$8,166,688	-7.89%
Q2 2006	$29,806,698	-1.27%	$23,092,882	10.30%	$7,918,751	-3.04%
Q3 2006	$31,032,994	4.11%	$23,834,664	3.21%	$8,825,304	11.45%
Q4 2006	$32,120,798	3.51%	$23,347,953	-2.04%	$9,437,686	6.94%
Q1 2007	$30,880,434	-3.86%	$21,443,359	-8.16%	$8,833,205	-6.40%
Q2 2007	$31,441,254	1.82%	$23,711,790	10.58%	$8,308,505	-5.94%
Q3 2007	$32,271,286	2.64%	$24,703,906	4.18%	$8,668,682	4.34%
Q4 2007	$33,687,435	4.39%	$23,866,866	-3.39%	$9,424,954	8.72%
Q1 2008	$32,421,226	-3.76%	$21,909,864	-8.20%	$8,786,004	-6.78%
Q2 2008	$33,817,273	4.31%	$25,000,125	14.10%	$9,576,282	8.99%
Q3 2008	$32,946,620	-2.57%	$25,749,975	3.00%	$8,753,726	-8.59%
Q4 2008	$32,744,814	-0.61%	$24,465,582	-4.99%	$9,663,084	10.39%
Q1 2009	$32,471,159	-0.84%	$22,402,258	-8.43%	$9,113,884	-5.68%
Q2 2009	$35,129,748	8.19%	$25,384,255	13.31%	$9,424,890	3.41%
Q3 2009	$34,207,606	-2.62%	$25,559,793	0.69%	$9,250,594	-1.85%

Source: North Dakota Office of State Tax Commissioner

Appendix Table 4. Grand Forks County's Full-service Restaurants, Limited-service Restaurants, and Drinking Places Subsectors Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009

	Taxable Sales and Purchases, 2009 Dollars					
	Grand Forks County's Full-service Restaurants		Grand Forks County's Limited-service Restaurants		Grand Forks County's Drinking Places	
Quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter
Q4 2004	$11,704,503	10.83%	$11,441,685	-3.54%	$4,918,527	1.83%
Q1 2005	$10,715,468	-8.45%	$9,923,645	-13.27%	$4,369,367	-11.17%
Q2 2005	$11,558,903	7.87%	$10,671,877	7.54%	$4,381,388	0.28%
Q3 2005	$11,505,392	-0.46%	$10,808,375	1.28%	$4,208,257	-3.95%
Q4 2005	$12,405,486	7.82%	$10,982,565	1.61%	$4,428,296	5.23%
Q1 2006	$11,537,347	-7.00%	$10,077,508	-8.24%	$3,973,258	-10.28%
Q2 2006	$11,799,689	2.27%	$10,794,294	7.11%	$3,755,132	-5.49%
Q3 2006	$12,397,450	5.07%	$11,032,471	2.21%	$3,872,161	3.12%
Q4 2006	$13,460,026	8.57%	$10,996,574	-0.33%	$3,963,784	2.37%
Q1 2007	$13,594,837	1.00%	$9,937,116	-9.63%	$3,883,945	-2.01%
Q2 2007	$13,792,757	1.46%	$10,532,428	5.99%	$3,943,271	1.53%
Q3 2007	$14,528,251	5.33%	$11,025,983	4.69%	$4,003,852	1.54%
Q4 2007	$14,513,168	-0.10%	$11,211,033	1.68%	$4,388,918	9.62%
Q1 2008	$13,466,536	-7.21%	$10,063,106	-10.24%	$4,044,040	-7.86%
Q2 2008	$14,360,911	6.64%	$11,128,457	10.59%	$4,170,888	3.14%
Q3 2008	$14,620,727	1.81%	$11,298,660	1.53%	$4,201,721	0.74%
Q4 2008	$13,947,394	-4.61%	$11,148,881	-1.33%	$4,430,421	5.44%
Q1 2009	$13,724,543	-1.60%	$9,926,260	-10.97%	$4,289,296	-3.19%
Q2 2009	$14,270,302	3.98%	$10,836,329	9.17%	$4,192,927	-2.25%
Q3 2009	$14,397,461	0.89%	$11,105,206	2.48%	$3,994,208	-4.74%

Source: North Dakota Office of State Tax Commissioner

Appendix Table 5. Fargo's Full-service Restaurants, Limited-service Restaurants, and Drinking Places Subsectors Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009

	Taxable Sales and Purchases, 2009 Dollars					
	Fargo's Full-service Restaurants		Fargo's Limited-service Restaurants		Fargo's Drinking Places	
Quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter
Q4 2004	$27,733,031	-0.89%	$19,185,447	-4.53%	$5,681,435	8.43%
Q1 2005	$25,747,676	-7.16%	$17,529,739	-8.63%	$5,388,686	-5.15%
Q2 2005	$26,667,131	3.57%	$19,430,779	10.84%	$6,191,705	14.90%
Q3 2005	$26,520,454	-0.55%	$20,009,259	2.98%	$6,796,133	9.76%
Q4 2005	$26,972,708	1.71%	$19,747,958	-1.31%	$7,460,042	9.77%
Q1 2006	$27,146,551	0.64%	$18,338,963	-7.13%	$6,886,225	-7.69%
Q2 2006	$26,839,466	-1.13%	$20,066,282	9.42%	$6,631,591	-3.70%
Q3 2006	$27,986,942	4.28%	$20,763,296	3.47%	$7,515,398	13.33%
Q4 2006	$28,981,726	3.55%	$20,630,499	-0.64%	$8,162,856	8.62%
Q1 2007	$27,913,602	-3.69%	$18,958,531	-8.10%	$7,696,056	-5.72%
Q2 2007	$28,710,900	2.86%	$20,712,425	9.25%	$7,144,317	-7.17%
Q3 2007	$29,388,060	2.36%	$21,669,720	4.62%	$7,413,411	3.77%
Q4 2007	$30,344,232	3.25%	$21,122,123	-2.53%	$7,810,999	5.36%
Q1 2008	$29,314,566	-3.39%	$19,526,423	-7.55%	$7,256,539	-7.10%
Q2 2008	$30,604,304	4.40%	$21,976,120	12.55%	$7,623,625	5.06%
Q3 2008	$29,729,659	-2.86%	$22,685,644	3.23%	$6,846,086	-10.20%
Q4 2008	$29,590,510	-0.47%	$21,692,044	-4.38%	$7,463,203	9.01%
Q1 2009	$29,338,854	-0.85%	$19,899,930	-8.26%	$7,077,437	-5.17%
Q2 2009	$31,884,609	8.68%	$22,524,182	13.19%	$7,363,010	4.03%
Q3 2009	$31,018,632	-2.72%	$22,839,195	1.40%	$7,167,189	-2.66%

Source: North Dakota Office of State Tax Commissioner

Appendix Table 6. City of Grand Forks Full-service Restaurants, Limited-service Restaurants, and Drinking Places Subsectors Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009

	Taxable Sales and Purchases, 2009 Dollars					
	Grand Forks Full-service Restaurants		Grand Forks Limited-service Restaurants		Grand Forks Drinking Places	
Quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter
Q4 2004	$11,511,714	11.45%	$10,991,863	-4.44%	$4,306,899	1.89%
Q1 2005	$10,554,512	-8.32%	$9,588,919	-12.76%	$3,849,926	-10.61%
Q2 2005	$11,387,413	7.89%	$10,298,422	7.40%	$3,770,451	-2.06%
Q3 2005	$11,392,734	0.05%	$10,496,965	1.93%	$3,543,009	-6.03%
Q4 2005	$12,299,685	7.96%	$10,568,052	0.68%	$3,835,952	8.27%
Q1 2006	$11,433,208	-7.04%	$9,771,543	-7.54%	$3,439,488	-10.34%
Q2 2006	$11,678,762	2.15%	$10,375,017	6.18%	$3,182,750	-7.46%
Q3 2006	$12,230,924	4.73%	$10,652,057	2.67%	$3,244,677	1.95%
Q4 2006	$13,313,946	8.85%	$10,705,799	0.50%	$3,409,205	5.07%
Q1 2007	$13,445,835	0.99%	$9,676,691	-9.61%	$3,356,346	-1.55%
Q2 2007	$13,636,252	1.42%	$10,150,204	4.89%	$3,390,732	1.02%
Q3 2007	$14,342,600	5.18%	$10,620,326	4.63%	$3,393,505	0.08%
Q4 2007	$14,354,440	0.08%	$10,843,355	2.10%	$3,776,059	11.27%
Q1 2008	$13,343,731	-7.04%	$9,741,929	-10.16%	$3,524,249	-6.67%
Q2 2008	$14,226,360	6.61%	$10,702,155	9.86%	$3,593,577	1.97%
Q3 2008	$14,447,166	1.55%	$10,878,724	1.65%	$3,574,088	-0.54%
Q4 2008	$13,817,987	-4.36%	$10,778,042	-0.93%	$3,831,186	7.19%
Q1 2009	$13,606,122	-1.53%	$9,649,557	-10.47%	$3,721,705	-2.86%
Q2 2009	$14,137,652	3.91%	$10,457,615	8.37%	$3,599,121	-3.29%
Q3 2009	$14,267,084	0.92%	$10,721,282	2.52%	$3,414,736	-5.12%

Source: North Dakota Office of State Tax Commissioner

Appendix Table 7. West Fargo Full-service Restaurants, Limited-service Restaurants, and Drinking Places Subsectors Taxable Sales and Purchases in 2009 Dollars, Q4 2004 – Q3 2009

	Taxable Sales and Purchases, 2009 Dollars					
	West Fargo Full-service Restaurants		West Fargo Limited-service Restaurants		West Fargo Drinking Places	
Quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter	2009 Dollars	% Chg from previous quarter
Q4 2004	$2,454,863	-17.56%	$2,208,888	-0.05%	$499,461	6.14%
Q1 2005	$2,232,595	-9.05%	$2,036,349	-7.81%	$488,989	-2.10%
Q2 2005	$2,435,232	9.08%	$2,599,358	27.65%	$499,102	2.07%
Q3 2005	$2,281,296	-6.32%	$2,606,778	0.29%	$483,016	-3.22%
Q4 2005	$2,323,429	1.85%	$2,475,802	-5.02%	$509,293	5.44%
Q1 2006	$2,438,525	4.95%	$2,265,959	-8.48%	$493,343	-3.13%
Q2 2006	$2,334,803	-4.25%	$2,591,100	14.35%	$489,655	-0.75%
Q3 2006	$2,418,573	3.59%	$2,617,089	1.00%	$455,587	-6.96%
Q4 2006	$2,512,832	3.90%	$2,300,946	-12.08%	$400,565	-12.08%
Q1 2007	$2,386,920	-5.01%	$2,156,214	-6.29%	$333,711	-16.69%
Q2 2007	$2,067,107	-13.40%*	$2,576,882	19.51%	$342,124	2.52%
Q3 2007	$2,196,988	6.28%	$2,579,153	0.09%	$426,693	24.72%
Q4 2007	$2,619,049	19.21%	$2,351,596	-8.82%	$730,848	71.28%
Q1 2008	$2,478,276	-5.37%	$2,085,506	-11.32%	$698,377	-4.44%
Q2 2008	$2,520,751	1.71%	$2,576,182	23.53%	$1,067,799	52.90%
Q3 2008	$2,450,682	-2.78%	$2,609,107	1.28%	$907,206	-15.04%
Q4 2008	$2,478,918	1.15%	$2,345,903	-10.09%	$1,203,457	32.66%
Q1 2009	$2,495,367	0.66%	$2,187,888	-6.74%	$1,055,623	-12.28%
Q2 2009	$2,540,058	1.79%	$2,500,854	14.30%	$1,113,202	5.45%
Q3 2009	$2,523,569	-0.65%	$2,355,776	-5.80%	$1,113,902	0.06%

*This is the sharpest quarterly decline during our study period. Since Q4 2004 is the start of study period, the change between Q3 2004 – Q4 2004 was not used (i.e., 17.56 percent).
Source: North Dakota Office of State Tax Commissioner

Appendix Table 8. Taxable Sales and Purchases for Full-service Restaurants, Limited-service Restaurants, and Drinking Places Subsectors in Cass County, Grand Forks County, Fargo, Grand Forks, and West Fargo as a Proportion of North Dakota's Accommodation and Food Services Sector, Q4 2004 – Q3 2009

	Proportion of North Dakota Accommodation and Food Services Sector														
	Full-service Restaurants					Limited-service Restaurants					Drinking Places				
Quarter	Cass Co.	Grand Forks Co.	Fargo	West Fargo	Grand Forks city	Cass Co.	Grand Forks Co.	Fargo	West Fargo	Grand Forks city	Cass Co.	Grand Forks Co.	Fargo	West Fargo	Grand Forks city
Q4 2004	12.11%	4.61%	10.91%	0.97%	4.53%	8.66%	4.50%	7.55%	0.87%	4.32%	2.80%	1.94%	2.24%	0.20%	1.69%
Q1 2005	12.58%	4.73%	11.37%	0.99%	4.66%	8.84%	4.38%	7.74%	0.90%	4.23%	2.95%	1.93%	2.38%	0.22%	1.70%
Q2 2005	11.63%	4.53%	10.45%	0.95%	4.46%	8.80%	4.18%	7.62%	1.02%	4.04%	2.98%	1.72%	2.43%	0.20%	1.48%
Q3 2005	10.75%	4.21%	9.69%	0.83%	4.16%	8.44%	3.95%	7.31%	0.95%	3.84%	2.98%	1.54%	2.48%	0.18%	1.30%
Q4 2005	11.67%	4.84%	10.52%	0.91%	4.80%	8.83%	4.28%	7.70%	0.97%	4.12%	3.46%	1.73%	2.91%	0.20%	1.50%
Q1 2006	12.77%	4.88%	11.48%	1.03%	4.84%	8.86%	4.26%	7.76%	0.96%	4.13%	3.45%	1.68%	2.91%	0.21%	1.45%
Q2 2006	11.52%	4.56%	10.38%	0.90%	4.51%	8.93%	4.17%	7.76%	1.00%	4.01%	3.06%	1.45%	2.56%	0.19%	1.23%
Q3 2006	11.00%	4.39%	9.92%	0.86%	4.33%	8.45%	3.91%	7.36%	0.93%	3.77%	3.13%	1.37%	2.66%	0.16%	1.15%
Q4 2006	12.01%	5.03%	10.84%	0.94%	4.98%	8.73%	4.11%	7.71%	0.86%	4.00%	3.53%	1.48%	3.05%	0.15%	1.27%
Q1 2007	12.64%	5.57%	11.43%	0.98%	5.50%	8.78%	4.07%	7.76%	0.88%	3.96%	3.62%	1.59%	3.15%	0.14%	1.37%
Q2 2007	11.69%	5.13%	10.68%	0.77%	5.07%	8.82%	3.92%	7.70%	0.96%	3.77%	3.09%	1.47%	2.66%	0.13%	1.26%
Q3 2007	10.82%	4.87%	9.85%	0.74%	4.81%	8.28%	3.70%	7.26%	0.86%	3.56%	2.91%	1.34%	2.48%	0.14%	1.14%
Q4 2007	11.81%	5.09%	10.64%	0.92%	5.03%	8.37%	3.93%	7.41%	0.82%	3.80%	3.31%	1.54%	2.74%	0.26%	1.32%
Q1 2008	12.64%	5.25%	11.43%	0.97%	5.20%	8.54%	3.92%	7.61%	0.81%	3.80%	3.43%	1.58%	2.83%	0.27%	1.37%
Q2 2008	11.57%	4.91%	10.47%	0.86%	4.87%	8.55%	3.81%	7.52%	0.88%	3.66%	3.28%	1.43%	2.61%	0.37%	1.23%
Q3 2008	10.56%	4.69%	9.53%	0.79%	4.63%	8.25%	3.62%	7.27%	0.84%	3.49%	2.81%	1.35%	2.19%	0.29%	1.15%
Q4 2008	11.48%	4.89%	10.38%	0.87%	4.85%	8.58%	3.91%	7.61%	0.82%	3.78%	3.39%	1.55%	2.62%	0.42%	1.34%
Q1 2009	12.28%	5.19%	11.10%	0.94%	5.15%	8.48%	3.76%	7.53%	0.83%	3.65%	3.45%	1.62%	2.68%	0.40%	1.41%
Q2 2009	11.74%	4.77%	10.65%	0.85%	4.72%	8.48%	3.62%	7.53%	0.84%	3.49%	3.15%	1.40%	2.46%	0.37%	1.20%
Q3 2009	10.63%	4.47%	9.64%	0.78%	4.43%	7.94%	3.45%	7.10%	0.73%	3.33%	2.87%	1.24%	2.23%	0.35%	1.06%

Section 3: Survey of Bar Employees

Appendix Table 9. Respondents' perception of change within their establishment in past two years

Areas of potential change	Percent of respondents							
	Mean**	Greatly decreased (1)	(2)	(3)	(4)	Greatly increased (5)	Do not know / missing	Total
Your scheduled number of hours per week								
OVERALL (N=89)	2.94	6.7	15.7	53.9	12.4	5.6	5.6	99.9
Large establishments (N=51)	3.06	3.9	9.8	58.8	15.7	3.9	7.8	99.9
Small establishments (N=38)	2.78	10.5	23.7	47.4	7.9	7.9	2.6	100.0
Your hourly wage or monthly salary*								
OVERALL (N=89)	2.98	10.1	4.5	61.8	15.7	3.4	4.5	100.0
Large establishments (N=51)	3.23	3.9	2.0	62.7	19.6	5.9	5.9	100.0
Small establishments (N=38)	2.65	18.4	7.9	60.5	10.5	0.0	2.6	99.9
Your tips (if you receive them)*								
OVERALL (N=89)	2.35	27.0	22.5	25.8	14.6	1.1	9.0	100.0
Large establishments (N=51)	2.82	9.8	21.6	33.3	21.6	2.0	5.9	100.0
Small establishments (N=38)	1.75	50.0	23.7	15.8	5.3	0.0	5.3	100.1
The total number of full-time employees*								
OVERALL (N=89)	2.62	7.9	27.0	46.1	6.7	1.1	11.2	100.0
Large establishments (N=51)	2.88	0.0	23.5	49.0	9.8	2.0	15.7	100.0
Small establishments (N=38)	2.31	18.4	31.6	42.1	2.6	0.0	5.3	100.0
The total number of part-time employees*								
OVERALL (N=89)	2.63	15.7	23.6	31.5	19.1	1.1	9.0	100.0
Large establishments (N=51)	3.00	5.9	15.7	37.3	27.5	0.0	13.7	100.0
Small establishments (N=38)	2.19	28.9	34.2	23.7	7.9	2.6	2.6	99.9

*Significant at p<.05 level.
**Means are based on a one to five scale, with one being "greatly decreased" and five being "greatly increased." "Do not know/missing" was excluded from the mean.

Appendix Table 10. Respondents' perception regarding whether there were changes in various business strategies over the past two years

Strategies	Percent of respondents			
	Decreased	No change	Increased	Total
Quality of product (bottom-shelf vs top-shelf liquor)*				
OVERALL (N=86)	12.8	77.9	9.3	100.0
Large establishments (N=48)	4.2	81.3	14.6	100.0
Small establishments (N=38)	23.7	73.7	2.6	100.0
Menu offerings				
OVERALL (N=88)	19.3	56.8	23.9	100.0
Large establishments (N=50)	26.0	48.0	26.0	100.0
Small establishments (N=38)	10.5	68.4	21.1	100.0
Advertising				
OVERALL (N=86)	22.1	47.7	30.2	100.0
Large establishments (N=48)	18.8	54.2	27.1	100.0
Small establishments (N=38)	26.3	39.5	34.2	100.0
Nonsmokers (N=41)	24.4	31.7	43.9	100.0
Smokers (N=45)	20.0	62.2	17.8	100.0
Promotional marketing strategies (e.g., live entertainment, drink specials, etc.)				
OVERALL (N=87)	13.8	37.9	48.3	100.0
Large establishments (N=49)	12.2	46.9	40.8	100.0
Small establishments (N=38)	15.8	26.3	57.9	100.0

*Significant at p<.05 level.

Note: Respondents indicated decreases, no change, and increases in "other" strategies on their survey but did not specify what the strategies were.

Appendix Table 11. Respondents' perception of whether there were changes in the number of clientele in the past two years

Types of clientele	Percent of respondents							
	Mean**	Greatly decreased (1)	(2)	(3)	(4)	Greatly increased (5)	Do not know	Total
Total number of patrons*								
OVERALL (N=89)	2.27	28.1	33.7	20.2	10.1	4.5	3.4	100.0
Large establishments (N=51)	2.71	9.8	35.3	29.4	15.7	5.9	3.9	100.0
Small establishments (N=37)	1.68	52.6	31.6	7.9	2.6	2.6	2.6	99.9
Number of college-aged patrons								
OVERALL (N=89)	2.65	13.5	27.0	38.2	15.7	2.2	3.4	100.0
Large establishments (N=51)	2.82	9.8	21.6	43.1	19.6	2.0	3.9	100.0
Small establishments (N=37)	2.43	18.4	34.2	31.6	10.5	2.6	2.6	99.9
Number of working class*								
OVERALL (N=89)	2.30	27.0	23.6	38.2	5.6	2.2	3.4	100.0
Large establishments (N=51)	2.69	9.8	23.5	52.9	5.9	3.9	3.9	100.0
Small establishments (N=37)	1.78	50.0	23.7	18.4	5.3	0.0	2.6	100.0
Number of professionals*								
OVERALL (N=89)	2.62	12.4	21.3	53.9	5.6	2.2	4.5	99.9
Large establishments (N=51)	2.96	2.0	13.7	68.6	9.8	2.0	3.9	99.9
Small establishments (N=37)	2.17	26.3	31.6	34.2	0.0	2.6	5.3	100.0
Number of local "regulars"*								
OVERALL (N=89)	2.51	20.2	24.7	38.2	12.4	2.2	2.2	99.9
Large establishments (N=51)	2.88	7.8	19.6	49.0	15.7	3.9	3.9	99.9
Small establishments (N=37)	2.03	36.8	31.6	23.7	7.9	0.0	0.0	100.0
Nonsmokers (N=41)	2.78	12.2	24.4	41.5	17.1	4.9	0.0	100.1
Smokers (N=46)	2.26	28.3	26.1	37.0	8.7	0.0	0.0	100.1

*Significant at p<.05 level.
**Means are based on a one to five scale, with one being "greatly decreased" and five being "greatly increased." "Do not know" was excluded from the mean.
Note: Respondents specified "other" clientele on the survey. "Other" responses include: a decrease in the "after work crowd (5pm), nurses (3rd shift), over 50, and regulars." One respondent said there was an increase in "elderly."

Appendix Table 12. Respondents' perception of impact of smoking ordinance on their working environment

Establishment*	Percent of respondents						
	Mean**	Significant negative impact (1)	(2)	(3)	(4)	Significant positive impact (5)	Total
OVERALL (N=85)	2.99	22.4	21.2	14.1	20.0	22.4	99.9
Large establishments (N=48)	3.58	4.2	22.9	18.8	18.8	35.4	100.1
Small establishments (N=37)	2.22	45.9	18.9	8.1	21.6	5.4	99.9
Nonsmokers (N=41)	3.41	17.1	12.2	17.1	19.5	34.1	100.0
Smokers (N=44)	2.59	27.3	29.5	11.4	20.5	11.4	100.1

*Significant at p<.05 level.
**Means are based on a one to five scale, with one being "significant negative impact" and five being "significant positive impact."

Appendix Table 13. Respondents' support of the smoke-free ordinance when it took effect on July 1, 2008, and currently

Support for ordinance	Percent of respondents						
	Mean**	Not at all supportive (1)	(2)	(3)	(4)	Very supportive (5)	Total
When ordinance took effect (July 1, 2008)*							
OVERALL (N=89)	2.71	43.8	7.9	11.2	7.9	29.2	100.0
Large establishments (N=51)	3.33	27.5	7.8	9.8	13.7	41.2	100.0
Small establishments (N=38)	1.87	65.8	7.9	13.2	0.0	13.2	100.1
Nonsmokers (N=43)	3.16	32.6	9.3	9.3	7.0	41.9	100.1
Smokers (N=46)	2.28	54.3	6.5	13.0	8.7	17.4	99.9
Now, at this time							
OVERALL (N=89)	3.22	29.2	5.6	15.7	12.4	37.1	100.0
Large establishments (N=51) *	3.90	11.8	3.9	17.6	15.7	51.0	100.0
Small establishments (N=38) *	2.32	52.6	7.9	13.2	7.9	18.4	100.0
Nonsmokers (N=43)	3.56	23.3	7.0	14.0	2.3	53.5	100.1
Smokers (N=46)	2.91	34.8	4.3	17.4	21.7	21.7	99.9

*Significant at p<.05 level.
**Means are based on a one to five scale, with one being "not at all supportive" and five being "very supportive."

Appendix Table 14. Whether respondent worked at their establishment and whether establishment was smoke-free prior to July 1, 2008 ordinance

	Percent of respondents		
	Yes	No	Total
Did you work at this establishment prior to July 1, 2008?*			
OVERALL (N=87)	81.6	18.4	100.0
Large establishments (N=50)	80.0	20.0	100.0
Small establishments (N=37)	83.8	16.2	100.0
Was your establishment smoke-free prior to the July 1, 2008 ordinance?*			
OVERALL (N=89)	3.4	96.6	100.0
Large establishments (N=51)	3.9	96.1	100.0
Small establishments (N=38)	2.6	97.4	100.0

*Significant at p<.05 level.

Appendix Table 15. Main job/title of respondent

	Percent of respondents				
	Manager / Owner	Bartender	Server	Other	Total
OVERALL (N=89)*	18.0	51.7	19.1	11.2	100.0
Large establishments (N=51)	19.6	51.0	21.6	7.8	100.0
Small establishments (N=38)	15.8	52.6	15.8	15.8	100.0

*Significant at p<.05 level.

Appendix Table 15a. "Other" job/title of respondent

Main job/title	Number of responses
Bartender and server	3
Owner	2
DJ/singer	1
Manager and bartender	1
Manager and owner	1
Manager and security	1
Manager, bartender, and server	1
Manager and kitchen manager	1
Security	1
Total "other" responses	12

Appendix Table 16. Smoking status of respondent

	Percent of respondents				
	I am a regular cigarette smoker (every day)	I am an occasional cigarette smoker	I used to smoke, but quit	I have never smoked	Total
OVERALL (N=89)	30.3	21.3	12.4	36.0	100.0
Large establishments (N=51)	27.5	23.5	15.7	33.3	100.0
Small establishments (N=38)	34.2	18.4	7.9	39.5	100.0

SURVEY COVER LETTER

NDSU **NORTH DAKOTA STATE UNIVERSITY**
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April 7, 2010

Dear Madam/Sir:

We are conducting a research study about the potential economic impact of the smoke-free ordinances on bars in Fargo and West Fargo since the ordinances took effect. The study includes a survey which gathers opinions about the impact of the smoking ordinances on individual employees and bars. In addition to the survey, we are conducting an analysis of tax data from the Office of the State Tax Commissioner. By looking at these tax data in combination with the survey results, we hope to provide a comprehensive look at the overall economic impacts of the smoking ordinances. The study is sponsored by Fargo Cass Public Health.

You are invited to participate in this research study. The survey is voluntary and should take you about 5 minutes to complete. The information you provide is strictly confidential – please do not make any identifying marks on the survey. Your answers will be combined with those of other employees and reported in aggregate form.

If you choose to participate, you may return your survey to us using the postage-paid, self-addressed envelope. In order to be included in the analyses, it is important that we have your survey returned to us by **April 30, 2010**.

If you have questions about this research study, you may call Dr. Richard Rathge at 701-231-8621 or Bette Deede at 701-476-4148. If you have questions about your rights as a research participant or to report a problem about this research, you may call the NDSU Human Research Protection Program at 701-231-8908.

Thank you for assisting us with this important study.
Sincerely,

Richard W Rathge, Director
North Dakota State Data Center
North Dakota State University
PO Box 6050, Dept. 8000
Fargo, North Dakota 58108-6050

SURVEY INSTRUMENT

Economic Impact Study of a Smoke-free Ordinance in the Bar Industry

This survey is part of a larger project aimed at analyzing the economic impact of the smoke-free ordinances established in Fargo and West Fargo on July 1, 2008. The survey gathers information on the impact of the ordinances on individual employees and bars. Your participation is voluntary and greatly appreciated. Individual responses are confidential and vital to providing a complete picture of the overall economic impact of the ordinances.

The survey should take approximately 5 minutes to complete. Please do not leave any identifying marks. If you have questions regarding this survey, you may call Richard Rathge at 701-231-8621 (North Dakota State Data Center) or Betty Deede at 701-476-4148 (Fargo Cass Public Health). If you have questions about the rights of human research subjects, please call the NDSU Institutional Review Board at 701-231-8908. Thank you for your participation in this important study.

Q1. Did you work at this establishment prior to July 1, 2008? __Yes __No

Q2. What is your main job/title? (check one)

__Manager
__Bartender
__Server
__Other____________________

Q3. Using a one to five scale, with one being "greatly decreased" and five being "greatly increased," please indicate the extent to which each of the following has changed (or not) in your establishment over the past two years. (Circle your response)

	Greatly decreased (1)	(2)	No change (3)	(4)	Greatly increased (5)	Do not know (6)
a. Your scheduled number of hours per week	1	2	3	4	5	6
b. Your hourly wage or monthly salary	1	2	3	4	5	6
c. Your tips (if you receive them)	1	2	3	4	5	6
d. The total number of full-time employees	1	2	3	4	5	6
e. The total number of part-time employees	1	2	3	4	5	6

Q4. To your knowledge, has your establishment adjusted (i.e., decreased or increased) any of the following strategies over the past two years? (Check all that apply)

Strategy	Decreased	No change	Increased
a. Quality of product (bottom-shelf vs top-shelf liquor)	☐	☐	☐
b. Menu offerings	☐	☐	☐
c. Advertising	☐	☐	☐
d. Promotional marketing strategies (e.g., live entertainment, drink specials, etc.)	☐	☐	☐
e. Other strategies (specify)_______________________________________	☐	☐	☐

Q5. Using a scale from one to five, with one being "greatly decreased" and five being "greatly increased," please offer your opinion of what changes, if any, have occurred with the clientele that have frequented your establishment over the past two years? (Circle your responses)

Clientele	Greatly decreased (1)	(2)	No change (3)	(4)	Greatly increased (5)	Do not know (6)
Total number of patrons	1	2	3	4	5	6
Number of college-age patrons	1	2	3	4	5	6
Number of working class	1	2	3	4	5	6
Number of professionals	1	2	3	4	5	6
Number of local "regulars"	1	2	3	4	5	6
Other:________________________	1	2	3	4	5	6

Q6. Was your establishment smoke-free prior to the July 1, 2008 ordinance? (Check your response)

___Yes (Skip to Q8.)
___No

Q7. Using a scale from one to five, with one being "significant negative impact" and five being "significant positive impact," please tell us whether or not you think the smoking ordinance has had an impact on the **working environment** within your establishment over the last two years. (Circle your response)

	Significant negative impact (1)	(2)	No impact (3)	(4)	Significant positive impact (5)
Impact on **working environment** within your establishment over last two years	1	2	3	4	5

Q8. Which of the following statements describe you? (Check all that apply)

__I am a regular cigarette smoker (every day)
__I am an occasional cigarette smoker
__I used to smoke, but quit
__I have never smoked

Q9. Using a one to five scale, with one being "not at all supportive" and five being "very supportive," please indicate your level of support of the smoke-free ordinance now, and back when it took effect. (Circle your response)

	Not at all supportive (1)	(2)	Neutral (3)	(4)	Very supportive (5)
When ordinance took effect (July 1, 2008)	1	2	3	4	5
Now, at this time	1	2	3	4	5

Please feel free to provide us with additional comments.

Thank you helping us with this important study.

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