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SANTA FE, NEW MEXICO'S LIVING WAGE ORDINANCE AND ITS EFFECTS ON THE EMPLOYMENT AND WAGES OF WORKERS IN LOW-WAGE OCCUPATIONS'

Justin B. Hollis

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**SANTA FE, NEW MEXICO'S LIVING WAGE ORDINANCE AND ITS
EFFECTS ON THE EMPLOYMENT AND WAGES OF WORKERS IN
LOW-WAGE OCCUPATIONS**

BY

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B.S. ECONOMICS

THESIS

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By

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ABSTRACT

In June of 2004 the City of Santa Fe enacted a living wage ordinance requiring an \$8.50 minimum wage, the largest increase of a universal coverage municipal wage floor over its previous prevailing minimum of any municipal living wage law preceding it. Using occupational employment and wage estimates from the U.S. Bureau of Labor Statistics' Occupational Employment Statistics program, this paper analyzes the impact of Santa Fe's living wage on workers in low-wage occupations. Our estimates compare labor market outcomes for low-wage workers in Santa Fe and Albuquerque and show low-wage workers in Santa Fe experienced substantial hourly wage increases, and no discernible employment loss.

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Chapter 1

Introduction

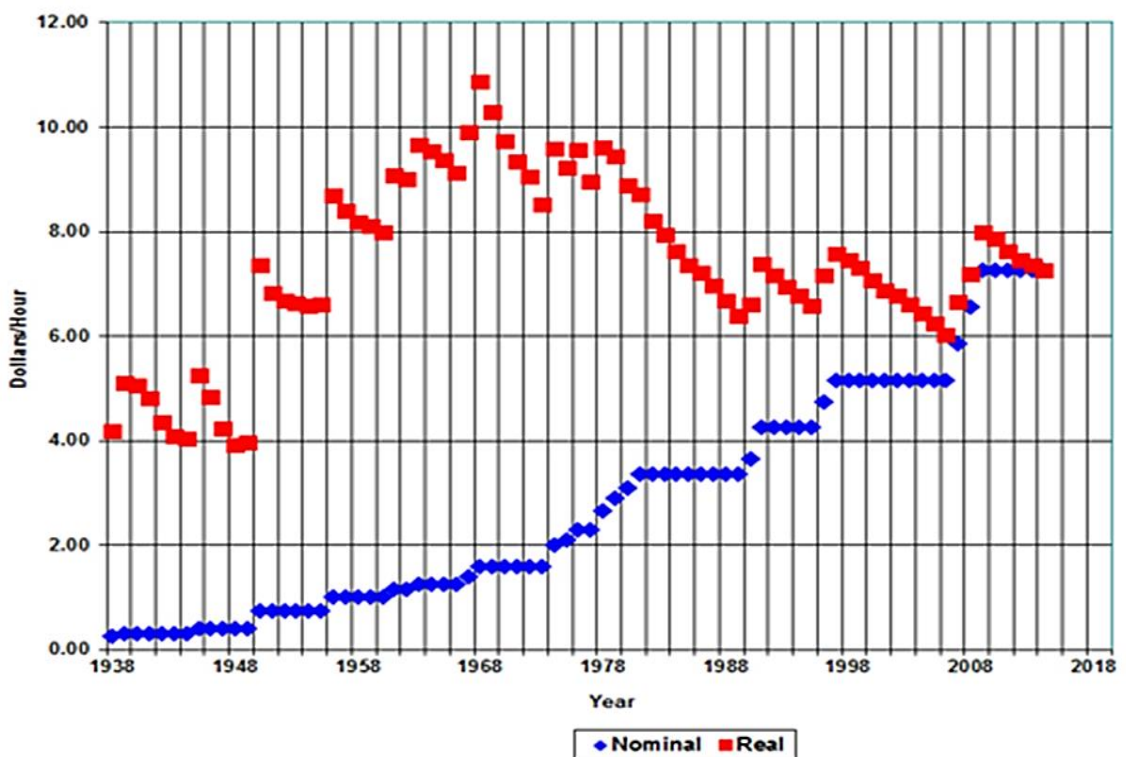
The City of Santa Fe implemented a citywide minimum wage on June 24, 2004, the nation's second municipal wage floor. Santa Fe's Living Wage Ordinance (LWO) initially covered all employees in private businesses with 25 or more employees operating within the city limits (Reynis *et al.*, 2007). Prior to Santa Fe's adoption of a citywide living wage ordinance, most municipal living wage ordinances applied only to city contractors (Pollin *et al.*, 2008; 11). Given the ordinance's broad coverage and that at \$8.50 the initial citywide minimum constituted a 65 percent increase over the previous \$5.15 federal minimum wage; Santa Fe's LWO represents a unique opportunity to evaluate the policy's effect on low-wage workers.

Background

The earliest minimum wages in the U.S. were a set of weak, state-specific laws designed to protect the most vulnerable members of the late nineteenth and early twentieth century U.S. labor force; women and children. In the years preceding the Fair Labor Standards Act (1938), as many as fifteen states had minimum wage laws. Minimum wage laws have their roots in the Progressive movement's belief that workers were entitled to a "living wage"; one which ensured workers a "decent standard of living" (Neumark and Wascher, 2008). Where a "minimum wage" refers to a standard which is in place, a "living wage" refers to an initiative that, when successful, results in a higher minimum wage. (Pollin *et al.*, 2008) Though Santa Fe's wage ordinance is referred to as its "Living Wage Ordinance", the law in fact is a minimum wage. Whether Santa Fe's minimum wage is a "living wage" is another debate. This thesis examines the impacts on labor market outcomes for workers most likely affected by a minimum wage; low-wage workers.

Modern municipal-level minimum wage laws came about, in part, as a response to a marked decline in the real value of the federal minimum wage since 1968. Figure 1 shows the federal minimum wage in nominal and real 2014 dollars. The overall downward trend in the purchasing power of the federal minimum wage prompted the District of Columbia to enact the nation's first municipal-level minimum wage in 1993. In the ensuing fifteen years, as many as 140 U.S. cities had minimum wage laws on their books.

Figure 1. Nominal vs Real Minimum Wage in 2014 dollars



Sources: U.S. Bureau of the Census; U.S. Department of Labor, Bureau of Labor Statistics; Statistical Abstract of the United States; and Survey of Current Business, <http://oregonstate.edu/instruct/anth484/minwage.html>, (date accessed, March 24, 2015)

San Francisco as of late has been the highest municipal minimum wage in the U.S., though Santa Fe competed for the highest municipal minimum wage briefly in 2013. San Francisco's minimum wage was a 26% increase over California's minimum

wage. Santa Fe's minimum wage, when initially adopted, was a 65% increase over the previous prevailing federal minimum wage, the largest increase over a previous prevailing wage of any municipal minimum wage law preceding it. All of the municipal minimum wage laws preceding Santa Fe limited their coverage to city workers, city contractors or large businesses. Santa Fe's minimum wage law is different. Though it initially exempted non-profit organizations providing home health care services with Medicaid reimbursement and businesses with fewer than 25 employees, by 2008 Santa Fe's minimum wage was the first to cover all employees of establishments operating within the city limits.

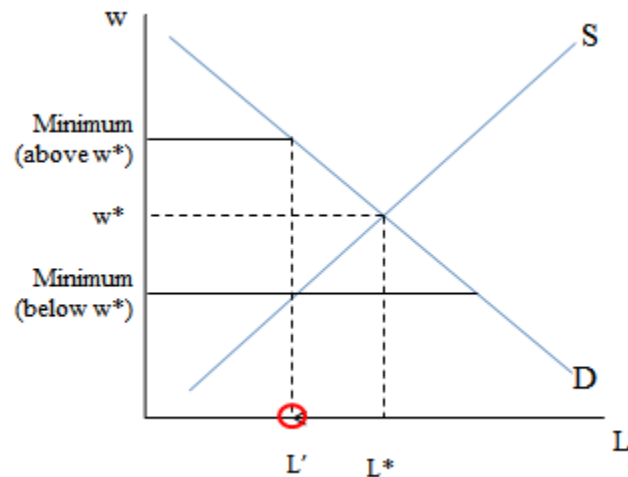
Since living wage ordinances are designed to lift the living standards of low-paid workers, evaluating how Santa Fe's LWO affected employment and wages among low-wage workers can yield important insights for policymakers. But who are low-wage workers? Most research defines and measures low-wage workers by demographic (e.g. teenagers) or industry (e.g. fast-food) characteristics. This thesis, however, defines low-wage workers by their occupation (e.g. laborers).

Using data from the Bureau of Labor Statistics' (BLS) Occupational Employment Statistics (OES), we assess how employment and wages for workers in low-wage occupations were affected by Santa Fe's LWO. Estimates from our triple difference model comparing differences in labor market outcomes between: (1) low-wage and higher wage workers (2) in Santa Fe and Albuquerque (3) before and after Santa Fe's LWO confirm results from other research suggesting no employment loss and large wage increases due to Santa Fe enacting a higher citywide minimum wage than surrounding areas.

Theory

We consider the competitive model of labor markets to frame what we might expect a minimum wage to do in the market for low-wage labor. Figure 2 shows how a competitive market for low-wage labor would adjust given a wage floor. A minimum wage set below the market wage for low-wage labor should not affect the level of employment or the wages received by low-wage workers since firms are able to pay, and workers are willing to work at the intersection of w^*, L^* . This minimum wage is said to be *non-binding*. However, binding minimum wages are set somewhere above where firms are willing to pay for low-wage labor. This model suggests that, given the downward sloping demand for low-wage labor, a binding minimum wage would result in unequivocal job loss for affected workers.

Figure 2. Competitive Labor Market Model with Minimum Wages



Chapter 2

Review of Related Literature

Studies of the labor market effects of a minimum wage have a long history beginning with Obenauer and Nienburg (1915) and their pioneering of the difference-in-differences approach to evaluate changes in the employment and wages of women and men workers in Oregon retailers following minimum wage laws for women passed there in 1913 and 1914 (Obenauer and Nienburg, 1915). Obenauer and Nienburg concluded that there was no employment loss for women attributable to the minimum wage law.

Card and Krueger (1995) used the difference-in-differences method to compare labor market outcomes between fast-food workers across the New Jersey and Pennsylvania state borders following New Jersey's adoption of a minimum wage. Their use of the fast-food industry has been replicated in many minimum wage studies and their approach of exploiting variation in minimum wage policy across adjacent geographies has become more feasible given the proliferation of more localized minimum wage laws.

Dube *et al.* (2010) bridge the gap between localized minimum wage studies and national minimum wage studies by examining all pairs of U.S. counties divided by a state border in which there was some variation in minimum wage policy.

Most minimum wage studies have found no overall or systematic effect on employment. The majority of minimum wage research unsurprisingly find increases in the hourly wages of likely affected workers, but some research also finds reductions in the number of worker hours such that the overall effect on annual wage earnings have been mixed. Minimum wage studies that examine how businesses employing large numbers of low-wage workers adjust have shown increases in prices among firms and within industries with lots of low-paid labor.

Studies of Santa Fe's LWO have been concerned with the estimated cost of the minimum wage for businesses, employment and wage effects for affected workers and the minimum wage's effects on Santa Fe's economy at large. Santa Fe's LWO set a wage floor of \$8.50 for all employees of establishments located in the city with more than 25 workers. Since the policy was implemented in June 2004, researchers have attempted to exploit the minimum wage differential between Santa Fe and the surrounding areas in order to assess the LWO's impact.

Pollin and Brenner (2008)

Pollin and Brenner (2008), in a study on the business impact of Santa Fe's initial \$8.50 minimum, used data from both the Bureau of Labor Statistics' (BLS) Current Population Survey (CPS) and from plaintiffs in a lawsuit contesting the wage ordinance in order to assess changes in economic conditions resulting from adoption of an increased citywide minimum. The CPS is a monthly household survey which contains data on employment, unemployment, labor force participation, hours of work, earnings and worker demographics (e.g. age, gender, race and educational attainment). Pollin and Brenner find that the 7,404 full-time equivalent workers they estimate were covered by the ordinance and that, on average, each would receive a mandated \$1.59 hourly wage increase.¹

¹ Based on the authors' sample of 5,685 full-time and 3,565 part-time workers with an average workweek of 33.3 hours and working 50 weeks a year. "If we convert all these workers to full-time, 40-hour per week equivalence, ...the number of full-time equivalent (FTE) workers earning below \$8.50 per hour is 7,404." (Pollin and Brenner, 2008; 74). Sources cited by authors are: 2001 County and Business Patterns, U.S. Census Bureau; Current Population Survey Outgoing Rotation Group 2001-2003 files, Bureau of Labor Statistics, U.S. Department of Labor.

Yelowitz (2005)

Yelowitz (2005) used data from the CPS in the study he conducted on behalf of the plaintiffs in the case challenging Santa Fe's implementation of its minimum wage to estimate the labor market effects of the increased citywide minimum wage. Yelowitz examined the likelihood of being unemployed in a given month using a probit model and evaluated changes in the number of hours worked by those remaining employed after the ordinance's enactment using ordinary least squares regression. The CPS data allowed Yelowitz to present results broken down by educational attainment.

Using the individual-level data, the author's basic model estimates the equation:

$$y_{ict} = \beta_0 + \beta_1 LWO_{ict} + \beta_2 X_{ict} + \beta_3 D_{it} + \beta_4 D_{ic} + \varepsilon_{ict}$$

where y_{ict} is either unemployment or usual hours of work for individual, i , in location, c , for the month and year, t . Locations included the Santa Fe metropolitan statistical area (MSA), the Las Cruces MSA, Albuquerque MSA and the rest of the state. The variable LWO_{ict} indicated whether individual, i , in location, c , for the month and year, t was subject to Santa Fe's wage ordinance. X_{ict} represented a vector of individual characteristics affecting work behavior including household size, whether the individual was working age (17 to 64, with individuals aged 16 omitted), marital status, head of household status, gender, educational attainment, race, ethnicity and veteran status. D_{it} and D_{ic} were dummy variables for time and location fixed effects. With LWO_{ict} , D_{it} and D_{ic} all included in the model, Yelowitz interpreted β_1 as estimating the "difference-in-difference" indicating the pure policy impact of Santa Fe's wage ordinance. Yelowitz, comparing workers with fewer than 12 years of educational attainment between Santa Fe

and Albuquerque found that for Santa Fe workers without high school diplomas, the minimum wage ordinance resulted in reduced usual hours of work per week by 3.6 hours (Yelowitz, 2005; 4,5,8 and 11).

Yelowitz also found a 0.69 percentage point increase in Santa Fe's unemployment rate due to its adoption of the \$8.50 citywide minimum. According to the author, the results can be expressed in terms of employment loss by calculating job loss by using Santa Fe's total labor force at the time.² Yelowitz calculated that 539 workers previously employed and subject to the wage ordinance (working in Santa Fe for establishments employing 25 or more workers) lost their jobs because of Santa Fe's LWO (relative to Albuquerque MSA) (Yelowitz, 2005; 5,7). Pollin and Luce (1998), however, remind us of the important distinction between employment loss and the unemployment rate stating that "the unemployment rate can also rise because low-income people who are out of the labor market might begin seeking jobs after the minimum wage has risen" (Pollin and Luce, 1998; 32).

Pollin and Wicks-Lim (2008)

Pollin and Wicks-Lim (2008) offer a refutation of Yelowitz's results by extending their analysis to account for the increase in the labor force participation rate. By including the 3.3 percent increase in the labor force participation of jobseekers with less than a high school diploma, as Yelowitz focuses on, Pollin and Wicks-Lim show virtually no decline in the number of jobs resulting from Santa Fe's LWO. Pollin and Wicks-Lim further their rebuttal of Yelowitz's results by offering that even if workers with less than

² Santa Fe's labor force in May of 2005 was 78,145. Yelowitz (2005) takes 0.69 percent of 78,145 in order to get at an approximation of the number of jobs lost due to the ordinance.

a high school diploma worked 3.5 fewer hours per week – as Yelowitz contends – the \$1.59 increase in their hourly wages coupled with the average 33 hours per week and 50 weeks per year worked by these workers still resulted in a net increase in annual earnings of \$2,647. Pollin and Wicks-Lim calculate a 10 percent increase in annual wage earnings for workers with less than a high school diploma even with the reduction in weekly work hours suggested by Yelowitz (Pollin and Wicks-Lim, 2005).

Bureau of Business and Economic Research (2007)

The University of New Mexico's (UNM) Bureau of Business and Economic Research (BBER) conducted a two-part analysis of Santa Fe's LWO and its impact on Santa Fe's economy. In the first report, Reynis *et al.* (2007) assess how initial implementation of Santa Fe's citywide minimum wage affected the number of businesses and employment. In the second report, Potter *et al.* (2007) analyze how Santa Fe's wage ordinance affected worker earnings and present results from surveys and focus groups of area businesses.

BBER Data

The BBER studies use administrative payroll data provided by the New Mexico Department of Workforce Solutions (DWS) compiled from the quarterly filings required by all establishments paying into the State's unemployment insurance (UI). The Covered Employment and Wages program, commonly called the ES-202 (ES for '*employment security*') program, is a partnership between the U.S. Bureau of Labor Statistics and the employment security agencies of the 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. The ES-202 program originated with the Social Security Act of 1935,

which authorized the collection of information for determining whether State unemployment compensation programs complied with the act. The ES-202 program is a comprehensive and accurate source of employment and earnings data, by industry, at the national, state, and county levels. It constitutes a virtual census of nonagricultural employees and their wages capturing 98% of all workers covered by unemployment insurance (BLS, 2013). The 2% not covered are primarily in certain agricultural, domestic, railroad, and religious workers (Dube *et al.*, 2010).

Numbers of Businesses

Because the ES202 data include the entire population of all establishments participating in the State's UI program and not a sample, Reynis *et al.* arithmetically calculated (rather than statistically estimated) changes in the total number of businesses – by size and location – in order to account for employment change in the labor markets of the City of Santa Fe, Santa Fe County (exclusive of the city) and Albuquerque. The authors characterized businesses with fewer than 25 employees as small businesses and establishments employing 25 or more as large businesses. Evaluating the overall change in the number of establishments by business size was important because, again, Santa Fe's LWO initially exempted businesses with fewer than 25 employees. The authors showed that the total population of UI-participating businesses was “decreasing in the years surrounding the two living wage implementations³ for nearly all locations, regardless of business size” (Reynis *et al.*, 2007; 53).

³ Santa Fe's 2004 Living Wage Ordinance initially mandated an \$8.50 minimum wage with plans to increase to \$9.50. Santa Fe's \$9.50 minimum wage took effect in March 2006.

Numbers of Large Businesses

The authors found that the 4.27 percent decrease in the number of large businesses in Santa Fe City following the initial \$8.50 minimum was larger than the 1.01 and 3.17 percent decreases for Albuquerque and Santa Fe County. In other words, Reynis *et al.* show – even while accounting for the overall decreasing trend in the numbers of businesses (statewide) occurring around the time of Santa Fe’s wage ordinances – that losses of large businesses in Santa Fe city following the minimum wage exceeded losses of large businesses experienced by Santa Fe County and Albuquerque over the same period. However, following Santa Fe’s increase to a \$9.50 citywide minimum wage Reynis *et al.* found that the number of large businesses in Santa Fe city grew from 306 to 325, due in part to 8 new establishments and 13 formerly small businesses growing to become large businesses. The 6.21 percent increase in the number of large businesses in Santa Fe city following the \$9.50 minimum was greater than the 1.21 percent growth in the number of large businesses in Albuquerque and far larger than the 2.78 percent decrease in the number of large businesses in Santa Fe County over the same period calculated by the authors (Reynis *et al.*, 2007). In sum, the authors found no evidence of large Santa Fe city businesses suffering due to Santa Fe’s LWO.

Numbers of Small Businesses

Following initial implementation of Santa Fe’s \$8.50 citywide minimum wage, Reynis *et al.* found decreases in the number of small businesses for Santa Fe city, Santa Fe County and Albuquerque. Following the \$8.50 minimum, Reynis *et al.* found an 11.7 percent decrease in the number of small businesses in Santa Fe County and a 3.92 percent decrease in the number of small businesses in Albuquerque. The decrease in Santa Fe

city small businesses was 4.4%, far less than that of the county (less the city) and comparable to small business losses in Albuquerque over the same period.

Average Employment

Changes in Employment by Business Size

Reynis *et al.* compared differences in employment reported by the population of UI participating establishments in the City of Santa Fe, Santa Fe County (exclusive of the city) and the City of Albuquerque both before and after Santa Fe enacted its citywide minimum wage. Santa Fe County and Albuquerque both maintained the federal minimum wage of \$5.15 while the citywide minimum wage in Santa Fe initially increased to \$8.50 in 2004 and to \$9.50 in 2006.

The authors analyzed changes in average employment per business for the City of Santa Fe and the control regions by business size and by industry, and compared businesses with fewer than 25 employees (small businesses) with establishments employing 25 or more (large businesses).

Average Employment for Large Businesses

Following the \$8.50 minimum wage, average employment in large businesses in Albuquerque and Santa Fe County (less the city) decreased by 3.25 (standard deviation 57.78) and 7.00 (standard deviation 28.60) respectively. Average employment for large businesses in the City of Santa Fe following the \$8.50 minimum wage increased by 0.20 (standard deviation 32.98). Following the \$9.50 minimum wage, average employment in large businesses in Albuquerque and Santa Fe County increased by 3.36 (standard deviation 51.15) and 0.99 (standard deviation 121.75). Average employment for large

businesses in Santa Fe City increased by 1.48 (standard deviation 24.18). The authors therefore found no evidence of reduction in average employment.

Average Employment for Small Businesses

For small businesses in Albuquerque and Santa Fe County following the \$8.50 minimum wage, average employment decreased by 0.11 (standard deviation 3.19) and 0.24 (standard deviation 2.42). For small businesses in Santa Fe City following the \$8.50 minimum wage, average employment fell by 0.14 (standard deviation 2.74). For small businesses in Albuquerque and Santa Fe County following the \$9.50 minimum wage, average employment decreased by 0.27 (standard deviation 1.83) and 0.01 (standard deviation 3.25). Average employment for small businesses in the City of Santa Fe following the \$9.50 minimum wage decreased by 0.08 (standard deviation 2.95). Given the small changes and large standard deviations, the authors found no evidence of employment loss for workers in small Santa Fe City businesses due to the LWO.

Worker Quarterly Earnings

Potter *et al.* (2007) used the difference-in-differences method to analyze changes in earnings for employees of businesses in Santa Fe City compared to those of the employees of businesses in Santa Fe County (minus the city) and Albuquerque. Using the same ES202 data as Reynis *et al.*, the authors created a longitudinal series of quarterly worker wages by matching worker and business IDs for all businesses submitting ES202 filings in Santa Fe city, Santa Fe County and Albuquerque. Because the ES202 data is reported at the establishment-level, it was important for the researchers to match business and worker IDs in order to track the employment of workers who had changed firms over the course of the study. Because the data had no information on

worker hours, Potter *et al.* included only those workers whose quarterly earnings were less than would have been the case had they worked 40 hours per week earning \$8.50 per hour. Because so many jobs are less than 40 hours per week, the ‘low-wage’ workers in the data included many workers who actually earned above \$8.50 per hour when Santa Fe’s minimum wage went into effect.

Earnings in Large Businesses (Santa Fe City vs Albuquerque)

Potter *et al.* compared changes in quarterly earnings for workers in large businesses between those employed in the City of Santa Fe and those employed in Albuquerque following the \$8.50 and \$9.50 minimum wages. The authors do not include a comparison of quarterly earnings for workers in large Santa Fe County businesses. Following the \$8.50 minimum wage, quarterly earnings for workers in large Santa Fe city businesses increased by \$34.88 while quarterly earnings for workers in large Albuquerque businesses following the \$8.50 minimum wage increased by \$47.25. These estimates are not statistically different. Following the \$9.50 minimum wage, quarterly earnings for workers in large Santa Fe businesses increased by \$10.89 while quarterly earnings for workers in large Albuquerque businesses decreased by \$5.19.

Earnings (Small Businesses vs. Large Businesses)

Potter *et al.* compared changes in quarterly earnings for workers between small and large businesses for those employed in the City of Santa Fe, Santa Fe County (less the city) and Albuquerque following the \$8.50 and \$9.50 minimum wages. Following the \$8.50 minimum wage, quarterly earnings for workers in small Albuquerque businesses were \$10.00 less than those of employees of large Albuquerque businesses. Quarterly

earnings for workers in small Santa Fe County businesses were \$41.96 more than quarterly earnings of workers in large Santa Fe County businesses. The largest gains in quarterly earnings for workers in small businesses over their large business counterparts occurred for employees of small businesses in Santa Fe city. Quarterly earnings for workers in small Santa Fe city businesses following the \$8.50 minimum wage were \$43.43 more than the large business counterparts following the \$8.50 minimum wage. Following the \$9.50 minimum wage, quarterly earnings for workers in small Albuquerque businesses were \$9.59 more than the quarterly earnings of workers in large Albuquerque businesses. Quarterly earnings for workers in small Santa Fe County workers following the \$9.50 minimum wage were \$18.16 more than their large business counterparts. Again, workers in small Santa Fe city businesses experienced the largest quarterly earnings gains over their large business counterparts among the three regions. Following the \$9.50 minimum wage, quarterly earnings for workers in small Santa Fe city businesses were \$18.32 more than workers in large Santa Fe city businesses. The authors compare small and large businesses because Santa Fe's LWO initially exempted establishments employing fewer than 25 workers. Following both the \$8.50 minimum wage and the increase to \$9.50, the authors found no increases in quarterly earnings exclusive to workers in Santa Fe City.

BBER Survey

A survey of 1,640 Santa Fe businesses and focus groups of 38 employers and workers were also conducted in order to provide the report with "stories" about how Santa Fe's minimum wage impacted members of the Santa Fe business community (Potter *et al.*, 2007).

The survey of Santa Fe businesses had a response rate of 17.6%⁴. Survey respondents were asked about their perceptions of the business climate, pay and benefits, employment practices, prices, capital investments and business expansion plans, as well as their hopes and concerns surrounding Santa Fe's LWO. Potter *et al.* found that "Overall, at least half of the sample reported no impact on various business operations as a result of the LWO" (Potter *et al.*, 2007; 53). Santa Fe businesses responding to the survey reported that in addition to raising pay for low wage workers, cutting overtime and changing how businesses deal with seasonal demand were common changes businesses made following the minimum wage increase (Potter *et al.*, 2007). Interestingly, Potter *et al.* also noted that small businesses (fewer than 25 employees) – though in many cases less able – had already been paying the mandated minimum in order to remain competitive in attracting and retaining workers (Potter *et al.*, 2007). Employers responding to the survey also described challenges to workplace morale brought about by new (often unskilled) employees being paid only slightly less than more established workers affecting management's ability to use pay increases as incentives (Potter *et al.*, 2007).

Schmitt and Rosnick (2011)

In a study of Santa Fe's LWO impacts on employment and wages, Schmitt and Rosnick (2011) use data from the BLS Quarterly Census of Employment and Wages (QCEW) in a difference-in-differences analysis comparing employment and wages within the City of Santa Fe with those in Los Alamos and Santa Fe county and with

⁴ The population included 3,590 businesses employing a positive number of employees in 2006 located within the city limits of Santa Fe. A final sample of 1,576 resulted following the authors' data collection process.

employment and wage changes in the City of Albuquerque as well as Bernalillo, Sandoval, and Valencia Counties from the second quarter of 2003 to the second quarter of 2007. Since the QCEW is made up of each State's ES202 filings and, as mentioned before, 98% of all employees are covered by unemployment insurance, the QCEW is as near a census of employment and wages as exists in federal labor statistics (Dube *et al.*, 2010).

The authors found that the difference in the drop in employment between Santa Fe city and the other locations three years following the \$8.50 minimum was 0.23 percent smaller suggesting little in the way of evidence for any substantial employment loss due to Santa Fe's wage ordinance. Schmitt and Rosnick conclude that their analysis of Santa Fe's minimum wage provided "little support for the idea that the citywide minimum wage reduced employment opportunities in the low-wage labor market there" (Schmitt and Rosnick, 2011). Overall Schmitt and Rosnick (2011) found no statistically significant differences in wages and no statistically significant differences in employment changes following Santa Fe's LWO relative to other localities (Schmitt and Rosnick, 2011).

Dube *et al.* (2010)

Research on local minimum wages "typically compare[s] adjoining local areas with different minimum wages around the time of a policy change" (Dube *et al.*, 2010). In a 2010 study, Dube *et al.* use pairs of cross-state counties in the U.S. between which minimum wage policies differed between 1990 and 2006. By comparing all contiguous county-pairs which straddle state borders with different minimum wage policies, Dube *et al.* analyze local minimum wages and generalize the results for minimum wage policies across the nation.

Using data from the QCEW, Dube *et al.* compared changes in employment and earnings for 288 pairs of cross-border counties with minimum wage differentials between the first quarter of 1991 through the second quarter of 2006. Dube *et al.* found “strong earnings effects and no employment effects of minimum wage increases” and argue that by generalizing the local minimum wage-study approach they better control for “unobserved heterogeneity in employment growth in the national-level studies” (Dube *et al.*, 2010; 961-2). Although Dube *et al.* reconcile the gap in the minimum wage literature between national and local minimum wage studies addressing the generalizability of local minimum wage studies, their study focused on the restaurant industry.

By contrast, our study is focused on low-wage workers in Santa Fe’s labor market, regardless of the industry in which the worker is employed because they are more likely than any other group of workers in the local labor market to experience changes in employment and pay resulting from the wage ordinance. Dube *et al.* point to the usefulness of analyzing adjoining geographies in evaluating the impacts of minimum wage differentials by explaining how most national-level studies implicitly assume that “one county in the United States is as good a control as any other” (Dube *et al.*, 2010; 949-50). Though our study is a local-level assessment of minimum wage impacts, the choice of an adjacent geography as a control is in line with the treatment-control settings of the minimum wage literature.⁵ Our study will compare the impact of Santa Fe’s minimum wages with those on low-wage workers in Albuquerque, specifically using the adjoining Metropolitan Statistical Areas (MSAs) in our “treatment-control” setup.

⁵ Card and Krueger (1994, 2000) use the counties bordering the adjoining states of New Jersey and Pennsylvania. Dube, Naidu and Reich (2007) use San Francisco and neighboring areas in California’s East Bay.

Though the Santa Fe and Albuquerque MSAs share a common border, the commuting distance between the City of Albuquerque and the City of Santa Fe is approximately 60 miles with fewer than 3 population centers with populations greater than 5,000 between them. We contend that the markets for low-wage labor in the cities of Santa Fe and Albuquerque are distinct.

Studies Using Occupational Definitions of Low-Wage Workers

Low-wage workers have been defined in terms of age, gender, educational attainment, industry or firm size, but none of the studies identify low-wage workers by their occupation. Since living wages covering enough workers to be evaluated using publically available data only exist in two cities: Santa Fe and San Francisco, few studies of the impacts of minimum wages on occupational employment and wages have been done.

Reich *et al.* (2003) analyzed an earlier, narrower set of San Francisco living wage policies covering only city service contractors, homecare workers and most low-wage workers at the San Francisco International Airport (SFO). San Francisco's 1999 wage policies set comparable pay and benefits mandates for more than 6,000 workers in the homecare industry, and an equal number of employees of the San Francisco's service contractors (Reich *et al.*, 2003). The focus of their study was the Quality Standard Program (QSP) which established a minimum wage of either \$9 per hour plus full health benefits, or \$10.25 without, as well as 12 days per year of paid time off for workers at SFO (Reich *et al.*, 2003). The QSP covered all workers at SFO and the authors calculated that the policy affected around 11,000 workers at the airport – at least one-

third of all airport workers (Reich *et al.*, 2003). The authors survey a representative sample of airport employers before and after the wage policy went into effect, adjusting to control for changing trends prior to enactment not directly related to the QSP like passenger volume, the opening of a then new International Terminal, improvements in management-labor relations and the overall strength (weakness) of the national a regional economies (Reich *et al.*, 2003). The authors conducted a telephone survey of airport employers gathering wage and benefit coverage information as of June 1999 with a response rate of 24 percent (Reich *et al.*, 2003). The authors conducted a mail survey followed by phone and in-person interviews of all covered SFO employers in order to generate their post wage-policy enactment data which resulted in a 35 percent response rate. The responding firms employed about half of the ground-based non-managerial workers at San Francisco's airport, some 5,626 workers. The survey instrument included questions about employment and wages by occupation. Reich *et al.* found that the largest pay increases resulting from the airport wage mandate were among entry-level workers, specifically screeners, baggage handlers, fuel agents, customer service agents, ramp workers and cabin cleaners (Reich *et al.*, 2003; 15).

The authors found that before the wage policy was enacted, over half (55 percent) of SFO's ground-based non-managerial occupations paid an average of less than \$10 per hour, but by June 2001, only 5 percent of those occupations were paying an average of less than \$10 per hour (Reich *et al.*, 2003; 15). The share of entry-level positions being paid \$10 per hour or more increased from less than 3 percent before the wage policy took effect to more than 80 percent by June 2001. The authors' Chi-squared tests of the before and after QSP wage distributions indicated that the differences in

wages they calculated were all highly statistically significant, each with p-values of 0.000 (Reich *et al.*, 2003; 41).

The authors examine the employment effects of the airport's wage mandate using a comparison between baseline employment-by-occupation data from an Airport Commission economic impact study conducted in 1998 and the authors' survey of airport employers. The authors found that the share of workers hired with only a high school diploma decreased from 31.6 percent before the airport's wage mandate to 23.1 percent immediately after its implementation, while the proportion of employees hired with high school and some college rose from 16.5 to 23.1 percent. However, the small disemployment effects Reich *et al.* found among low-wage workers at SFO were not statistically significant (Reich *et al.*, 2003).

Howes (2006) examines the doubling of the wages of home healthcare workers between 1996 and 2002 in the context of San Francisco's earlier, narrower wage ordinance covering city contractors, low-wage workers at the city's international airport as well as members of the publicly funded In-Home Support Services (IHSS) workforce. In 1995 all IHSS independent providers in California earned the state minimum wage of \$4.25. By March 2000, due to a number of political developments including unionization of the workforce, establishment of a consumer-labor coalition and the campaign for a living wage ordinance, wages for IHSS workers in San Francisco averaged \$10 per hour and even part-time workers were receiving medical, dental and vision care benefits (Howes, 2004).

Howes examined the impact of the doubling of wages and the addition of healthcare benefits on the stability of the IHSS workforce in San Francisco County using descriptive statistics and a logistic regression. The author studied the impact of these wage and benefit increases on workforce retention and found that the annual retention rate of new workers in the IHSS field rose substantially. Using data from the Case Management, Information and Payroll Services database of California County recipients and providers of home healthcare services, Howes analyzed differences in probability of a new home healthcare provider enduring for more than one year in the IHSS workforce from their date of entry between 1998 and 2001. Howes includes independent variables for workers' wage rates, whether the provider and recipient are related, dummy variables for health and dental care benefit coverage, and whether the provider worked in San Francisco during the relevant time period and also evaluates the changing retention probabilities for IHSS workers by race (Howes, 2004). The author found in her descriptive statistics that for new IHSS workers entering the industry between November 1997 and February 2001 (adjusted for natural exits), the sample average probability of an IHSS provider lasting one year from entry was 68.3 percent (standard deviation 0.46). The results from the authors logistic regression revealed that the proportion of new IHSS workers remaining in the field at least a year after entering between 1998 and 2001 increased by 89 percent, a result that was statistically significant at the 1 percent level (Howes, 2004).

Although from a much older study from before the time of municipal minimum wages in the U.S., Delehanty and Evans (1969) defined low-wage occupations in terms of detailed occupations in the Census of 1960 wherein at least 23 percent of year-round

workers earned less than \$3,000 in 1959 (Stewart, 1974; 22). Though unconcerned with minimum wages, Delehanty and Evans' approach to defining low-wage workers according to detailed descriptions found in federal data and wage distributions within occupations is relevant because our study defines low-wage workers in a similar way.

Chapter 3

Methodology

All studies of the employment effects of the minimum wage face the problem of identifying minimum wage workers who might have lost their jobs. Once they have no job, we cannot identify them by their wage. Table 1 shows several groups who were likely to earn less than \$8.50 in 2003, before enactment of Santa Fe's LWO. The data are drawn from the merged outgoing rotations of the CPS sample for Santa Fe and Albuquerque from 2002 to 2006.⁶ Teenagers were most likely to be affected by the law since more than 80 percent earned less than \$8.50. By contrast, only half of those with less than a high school diploma, and only half of restaurant workers earned the minimum wage in Santa Fe. Although teenage workers are likely to be affected by the LWO, the CPS sampled only 5 teen workers in 2003. This small sample size makes it difficult to draw inferences about labor market effects. The CPS data provide reliable estimates only at the state level and for the 12 largest metropolitan statistical areas (which do not include Santa Fe and Albuquerque)⁷.

Table 1. Percent of Hourly Workers Earning Less Than \$8.50 in 2003

Workers	Santa Fe	Albuquerque
All	26.3%	26.5%
Teenagers	82.2%	82.7%
Without a high school diploma	50.0%	54.3%
Restaurant and food workers	51.7%	80.2%
SOURCE: Current Population Survey, Merged Outgoing Rotation Groups, Bureau of Labor Statistics (compiled by NBER), author's calculations.		

By contrast, occupational data are drawn from a near-census of establishments.

According to the BLS, the sampling frame for occupational data (the list from which

⁶ I would like to thank Michael Hensley for providing the combined CPS data file.

⁷ U.S. Census Bureau Current Population Statistics. Frequently Asked Questions. <http://www.census.gov/cps/about/faq.html#Q3>. (accessed April 5, 2015)

establishments to be surveyed are selected) is derived from the list of establishments maintained by State Workforce Agencies (SWAs) for unemployment insurance purposes and we can identify occupations in which 75 percent of workers in Santa Fe earned less than \$8.50 prior to the LWO.

Data

The data are provided by the BLS Occupational Employment Statistics (OES) program. The OES use the Office of Management and Budget's Standard Occupational Classification (SOC) system. The SOC system is used by all federal statistical agencies for reporting occupational data and consists of over 800 detailed occupations and 23 major occupational groups. OES provides occupational employment and wage estimates at the major group and detailed occupational level.⁸

The OES program surveys around 200,000 establishments every six months (May and November), taking three years to fully collect the sample of 1.2 million establishments. The sampling frame (the list from which establishments to be surveyed are selected) is derived from the list of establishments maintained by State Workforce Agencies (SWAs) for unemployment insurance purposes and is drawn by the BLS in order to obtain data from every metropolitan and nonmetropolitan area in every State, across all surveyed industries, and from establishments of varying sizes. The three-year survey cycle is designed to reduce the burden on respondents so that businesses are not surveyed more than once every three years. As a federal-state partnership between the BLS and SWAs, the BLS draws the sample, produces the survey materials, and provides procedures and technical support while SWAs conduct the actual data collection. Since

⁸ New Mexico Department of Workforce Solutions Bureau of Economic Research and Analysis Occupational Employment Statistics. <http://www.dws.state.nm.us/eds/development.html>. (accessed January 6, 2015).

SWAs from all fifty states, the District of Columbia, Puerto Rico and the US Virgin Islands participate in the survey, the BLS produces national-level occupational wage and employment estimates by aggregating state and US territory-level data. The SWAs mail the survey materials to the selected establishments and make follow-up calls to request data from non-respondents or to clarify data. Because it is employers who respond to states' requests to participate in the OES survey that make the program's occupational employment and wage estimates possible⁹. We recognize the potential for selection bias (sample size notwithstanding). Employer participation for New Mexico is nearly 1,750 establishments for each panel producing a response rate of 75%.¹⁰

We are recognize that there may be sample selection bias since employers who respond to states' request to participate in the OES survey may be systematically different from employers who choose not to respond.

SWAs collect survey data for the payroll period including the 12th day of May or November. May 2013 employment and wage estimates are based on all data collected from establishments in the May 2013, November 2012, May 2012, November 2011, May 2011, and November 2010 semiannual samples.

Published occupational wage estimates in the five survey dates prior to May 2013 (November 2012, May 2012, November 2011, May 2011 and November 2010) were adjusted by the BLS to the May 2013 reference period using the over-the-year wage changes in the most applicable national Employment Cost Index (ECI) series. The BLS rationale for using the ECI adjustment is that the adjustment is designed to account for

⁹ US Bureau of Labor Statistics Occupational Employment Statistics. Overview. http://www.bls.gov/oes/oes_emp.htm. (accessed January 28, 2015).

¹⁰ New Mexico Department of Workforce Solutions Bureau of Economic Research and Analysis Occupational Employment Statistics. Overview. <http://www.dws.state.nm.us/eds/overview.html>. (accessed February 9, 2015).

inflation in employment costs faced by employers by using the national percentage change in wages by major occupational group over the previous year. The Bureau's ECI adjustment procedure assumes that each detailed occupation's wage, as measured in earlier years, moves with the average wage of the broader occupational category to which it belongs. For example, the average cost of employing a cook is assumed to trend with the average cost of employing food preparation serving and related occupations more generally. The adjustment also assumes that there are no major geographic differences in detailed occupations or major differences in occupational details themselves.¹¹ Wages are defined as straight time (i.e. no overtime) base pay, tips, cost-of-living allowances, guaranteed pay, hazardous-duty pay, on-call pay, and incentive pay like commissions and production-related bonuses. Not included in the data on wages are back pay, shift differentials, jury duty pay, overtime pay, severance pay, non-production (i.e. year-end) bonuses or tuition reimbursements.¹²

Measures of employment in the OES survey include both full-time and part-time employees, workers on paid vacations or other types of leave, workers on unpaid or short-term absences, salaried officers, executives, staff members of incorporated firms (all of whose earnings are reported in terms of hourly wages), employees temporarily assigned to other units, and employees for whom the reporting unit is their permanent duty station regardless of whether that unit prepares their paycheck. The OES survey

¹¹ New Mexico Department of Workforce Solutions Bureau of Economic Research and Analysis Occupational Employment Statistics. <http://www.dws.state.nm.us/eds/definitions.html>. (accessed January 6, 2015).

¹² New Mexico Department of Workforce Solutions Bureau of Economic Research and Analysis Occupational Employment Statistics. <http://www.dws.state.nm.us/eds/definitions.html>. (accessed January 6, 2015).

covers all nonfarm industries and excludes the self-employed, owners/partners of unincorporated firms and unpaid family workers.¹³

Though the OES survey produces estimates of occupational employment and wages at the North American Industry Classification System (NAICS), 3-digit, 4-digit, and selected 5- and 6-digit industry levels, the employment and wage estimates for detailed occupations used in our analysis are across industry and include all types of workers.

We obtained annual employment and wage estimates from the BLS OES for workers in the Santa Fe and Albuquerque, New Mexico Metropolitan Statistical Areas (MSAs) for each May from 2001 to 2012. Because Santa Fe's citywide minimum wage increases between May 2001 and May 2012 occurred in the months of June, March or January, matching between OES reference periods and increases in the minimum wage is imperfect. Because the minimum wage ordinance in Santa Fe applies only to establishments operating within the city limits and the boundaries of the MSA extend to those of Santa Fe County, there are likely establishments not subject to the law in our sample. In the year prior to the LWO approximately half of Santa Fe MSA's residents lived outside of Santa Fe city limits.¹⁴

The BLS lists seven challenges in using OES data as a time series. The first are changes in the occupational classification. The 2004-2009 OES data provides estimates for all occupations in the 2000 SOC. The May 2010 data provides estimates for most

¹³ New Mexico Department of Workforce Solutions Bureau of Economic Research and Analysis Occupational Employment Statistics. <http://www.dws.state.nm.us/eds/definitions.html>. (accessed January 6, 2015).

¹⁴ Population of the Santa Fe MSA on July 1, 2003 was 135,213. The population residing within Santa Fe city limits on July 1, 2003 was 66,776 (US Census Bureau, Population Division, 2010; BBER). <https://bber.unm.edu/demo/MSA00-10Rev.htm>. (date accessed February 19, 2015).

occupations in the 2010 SOC. However, none of the low-wage occupations in our study were affected by the changes in occupational classification. Changes in industrial classifications used in OES data did not affect our analysis since we took our occupational employment and wage estimates across industry. Changes in geographical classifications (the number of MSAs, nonmetropolitan areas and metropolitan divisions) used by the OES program between 2005 and 2011 did not affect how Santa Fe and Albuquerque MSAs were classified. There were changes in how occupational data were collected prior to 2001, however our data is from after 2001 and was therefore unaffected by these changes. In 2002, the reference months for the OES survey were changed from October, November and December to May and November in order to reduce seasonal influence on occupational employment or wages. <Most of our data come from after this change, and provided that Santa Fe and Albuquerque were affected similarly, this change does not compromise our results. Changes in mean wage estimation methodology only affected occupations with any workers earning above \$70 per hour. However, our study is concerned with low-wage occupations, and, again, since Santa Fe and Albuquerque were subject to the same change, our results should still be robust. The last caution the BLS gives for using the OES as a time series points to the permanent features of the OES methodology, specifically the fact that every six months, a new panel of data is added, and the oldest panel is dropped, resulting in a moving average pattern. However, our comparisons of occupations were not affected by the classification changes, and our data covers a period of 11 years, more than six panels of data the BLS recommends for the sudden changes in occupational employment and wage data resulting from permanent features of the OES survey methodology to attenuate (BLS, 2014).

Low-wage workers

Using the wage quartiles reported by the OES, occupations in which at least 75 percent of workers were paid less than \$8.50 were used to define the groups of lowest-paid workers in our study. Occupations in which at least half of workers earned below \$8.50 constituted a second group of interest. Workers in these jobs were also low-wage but in lower concentrations than the group of workers in occupations where three-quarters earned less than the proposed minimum wage. Table 2 gives descriptions of the occupations in Santa Fe MSA where at least half of employees made less than \$8.50 per hour prior to enactment of Santa Fe's first minimum wage and occupations where at least 75 percent of employees made less than \$8.50. Table 2 gives detailed descriptions of the lowest paid occupations in Santa Fe's labor market prior to enactment of the wage ordinance along with their average and median wages and employment. There were five occupations in which at least 75 percent of workers earned less than \$8.50 per hour in Santa Fe in 2003 and an additional nine detailed occupations where half of workers earned less than \$8.50 prior to the wage ordinance taking effect. The lowest-paid occupations include fast food cooks, maids and housekeepers, packers and packagers, dining room and cafeteria attendants, and waiters and waitresses.

Table 2. Low-wage Occupations prior to LWO, Santa Fe MSA, May 2003

Occupation		Avg. Hourly Wage	Median Hourly Wage	Total Employment
75 th percentile paid below \$8.50 in May 2003	Cooks, fast food	6.76	6.57	720
	Dining room, cafeteria & bartender help	7.32	6.89	250
	Maids and housekeeping cleaners	7.49	7.30	900
	Packers and packagers, hand	6.51	6.28	270
	Waiters and waitresses	7.65	6.50	1720
Total				3860
<i>continued from above</i>				
50 th percentile paid below \$8.50 in May 2003	Baggage porters and bellhops	7.17	6.45	40
	Bus drivers, school	9.01	7.69	180
	Cleaners of vehicles and equipment	7.21	6.86	140
	Cooks, short order	8.05	8.49	250
	Counter and rental clerks	8.83	8.28	180
	Counter attendants, cafeteria, food concessions & coffee shop	8.03	7.69	90
	Dishwashers	7.77	7.82	480
	Fine artists, including painters, sculptors & illustrators	15.79	8.44	30
	Laundry and dry- cleaning workers	7.86	7.84	100
Total				5350
NOTES: Wages include tips. Santa Fe exempted businesses with fewer than 25 employees from the wage ordinance until 2008. SOURCE: BLS Occupational Employment Statistics, author's calculations.				

Table 3 gives the occupational employment and wage characteristics of our sample. Santa Fe and Albuquerque's average occupational employment and wages are shown for the periods prior to the LWO, during Santa Fe's \$8.50 minimum wage, and following Santa Fe's increase to a minimum wage of \$9.50. Table 3 also shows the

characteristics of Santa Fe and Albuquerque's labor market in terms of low-wage occupations.

Table 3. Occupational Wages and Employment for Santa Fe and Albuquerque

		Santa Fe MSA			Albuquerque MSA		
		2001-04	2005-06	2007-12	2001-04	2005-06	2007-12
All occupations							
	Average occupational wage	\$18.17	\$19.17	\$21.25	\$17.81	\$20.04	\$22.59
	Average occupational employment	235	201	223	761	801	786
	Average No. of Occupations	278	295	271	457	504	519
Low-wage: 75 th percentile paid below \$8.50 in May 2003	Average occupational wage	\$7.16	\$8.13	\$10.22	\$6.96	\$7.36	\$8.83
	Average occupational employment	756	702	647	1,948	2,036	2,005
	No. of Occupations	5					
Low-wage: 50 th percentile paid below \$8.50 in May 2003	Average occupational wage	\$8.79	\$9.69	\$10.73	\$7.68	\$8.02	\$9.39
	Average occupational employment	393	383	369	1,767	1,873	1,848
	No. of Occupations	14					
NOTES: Wages include tips. Santa Fe exempted businesses with fewer than 25 employees from the wage ordinance until 2008. SOURCE: BLS Occupational Employment Statistics, author’s calculations.							

Given the timing of the two largest relative increases in Santa Fe's minimum wage – occurring on June 24, 2004 and on March 1, 2006 respectively – the one-month anticipatory effect of the June 2004 implementation with our May 2004 data and the two-month lagged effect of the March 2006 increase with our May 2006 data, make testing for changes in employment or wages attributable to Santa Fe's minimum wage increases

around this time reasonable since the timing of the increase and the OES survey collection were so close.

The BLS publishes OES estimates for each year national, state and metropolitan area the mean wage, the 25th percentile wage, the median wage, and the 75th percentile wage. Using the quartiles we test for employment and wage effects of Santa Fe's minimum wage increases on low-wage occupations based on the concentration of low-wage workers in a given occupation.

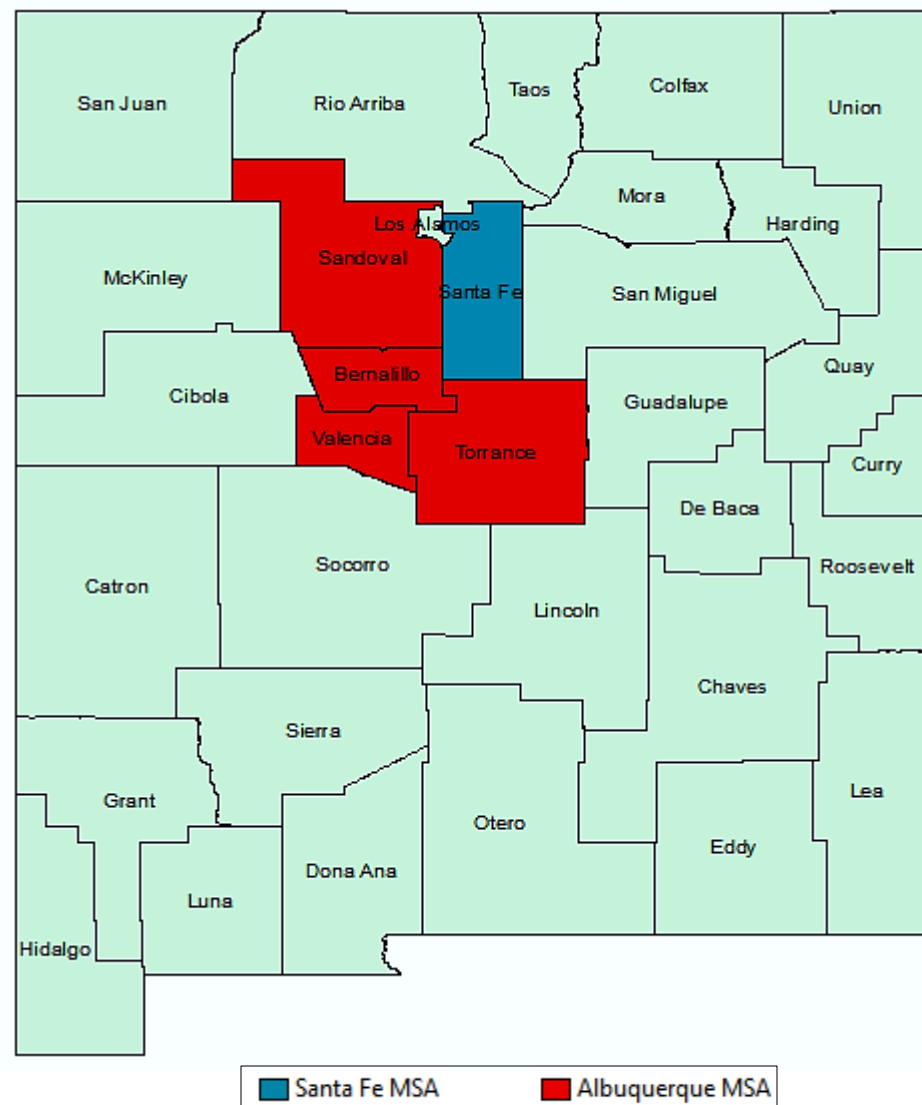
Because it is less sensitive to extreme values in the upper tail of the wage distribution and to compression in the lower tail, our paper used the median occupational wage to define the threshold below which workers were considered 'low-wage' as median wages are better measures of the central tendency of a wage distribution (Maloney and Mendez, 2003).

Given that the smallest geographic data available in the OES is the MSA, Albuquerque MSA seemed a logical choice for a control insofar as Albuquerque having maintained the federal minimum wage of \$5.15 while Santa Fe increased its minimum wage three times from 2004 to 2006 and because the Albuquerque MSA is the only adjoining MSA to Santa Fe's MSA in the State of New Mexico.

Figure 3 shows the State of New Mexico, delineating all 33 counties, and highlighting the Santa Fe and Albuquerque MSAs. The MSAs are depicted according the U.S. Census Bureau's Geographic Names Information Systems Identifier (GNIS ID) and consist of the county, counties or equivalent entities associated with at least one urbanized area with a population of at least 50,000 (US Census Bureau, 2012). The Albuquerque MSA consists of four counties including Sandoval, Bernalillo, Valencia and

Torrance counties. The Santa Fe MSA and the County of Santa Fe are one in the same. The other two MSAs in New Mexico – Farmington and Las Cruces - consist solely of San Juan County in northwest New Mexico and Doña Ana County in southern New Mexico, respectively. Neither of the other two MSAs in New Mexico – Farmington or Las Cruces – shares a border with the Santa Fe MSA.

Figure 3. Santa Fe and Albuquerque Metropolitan Statistical Areas (MSA) and New Mexico Counties

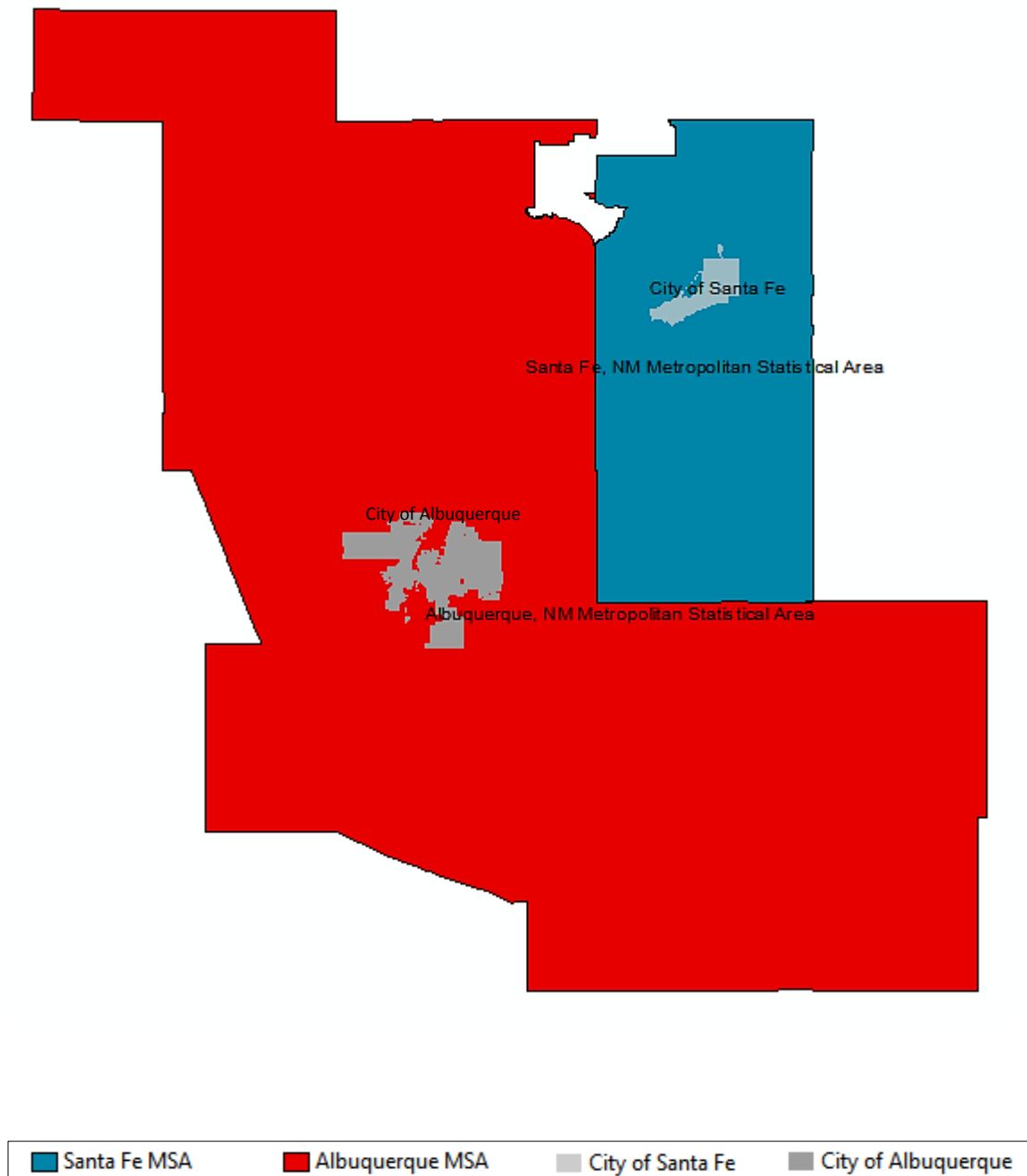


NOTE: Farmington MSA consists of San Juan County. Las Cruces MSA consists of Dona Ana County.

SOURCE: US Census Bureau Geographic Names Information System Identifications. New Mexico Community Data Collaborative. Author's map using ArcGIS.

Figure 4 shows an inset of the map in Figure 3 highlighting the city limits of Santa Fe and Albuquerque within their respective MSAs.

Figure 4. Santa Fe and Albuquerque Metropolitan Statistical Areas (MSAs) and municipal boundaries



SOURCE: US Census Bureau Geographic Names Information System Identifications. City of Santa Fe city limits from Albuquerque city limits courtesy City of Albuquerque.

<http://coagisweb.cabq.gov/arcgis/rest/services/public/adminboundaries/MapServer> (accessed January 29, 2015). New Mexico Community Data Collaborative. Author's map using ArcGIS.

The map in Figure 4 supports the notion that though the commute between the city of Santa Fe and the city of Albuquerque is roughly 60 miles, regular workday commuters between the cities are likely not low-wage workers. Workers earning the minimum wage are not likely to sacrifice the two-hour round-trip commute for so little a gain in hourly wages.

Figure 5 shows total occupational employment in the Santa Fe and Albuquerque MSAs from May 2001 to May 2012 for workers in occupations paying at least 75 percent of workers less than \$8.50 per hour in 2003. Figure 5 suggests that growth in employment among the lowest-paid occupation was increasing rapidly in the Albuquerque MSA prior to Santa Fe's LWO while growth in employment for workers in the same occupations in Santa Fe MSA was a bit slower.

Figure 5. Total Employment for Occupations where 75 percent earned below \$8.50

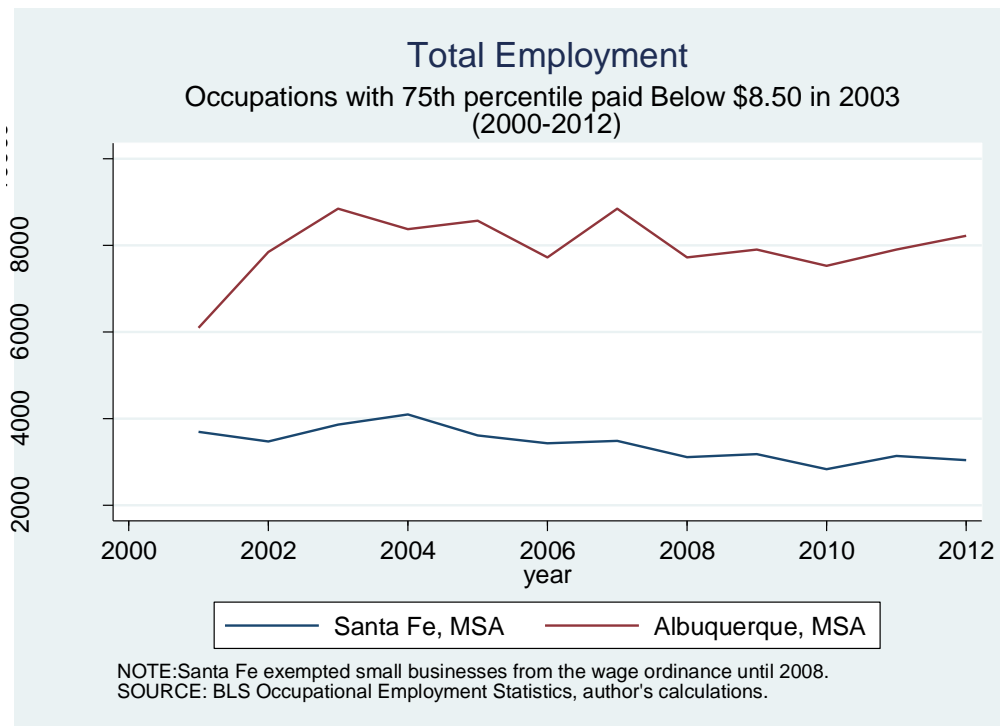


Figure 6 shows total occupational employment in the Santa Fe and Albuquerque MSAs from May 2001 to May 2012 for workers in occupations paying at least half of workers less than \$8.50 per hour in 2003. Figure 6 suggests that employment growth for workers in occupations with lower concentrations of low-paid workers was modest and comparable for both Albuquerque and Santa Fe MSAs. The similarity in employment trends for these low-wage occupation prior to the LWO support to our use of the difference-in-differences methodology we use to evaluate the employment effects of Santa Fe’s minimum wage.

Figure 6. Total Employment for Occupations where 50 percent earned below \$8.50

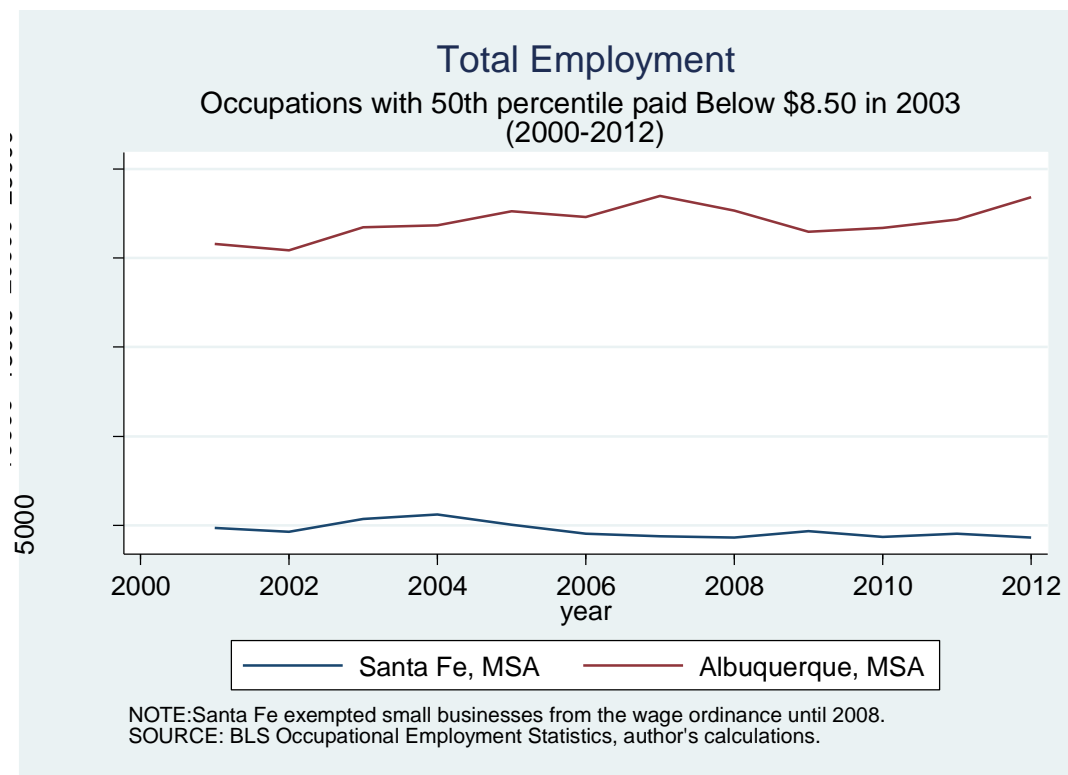


Figure 7 shows average hourly wages for occupation in which at least 75 percent of workers were paid less than \$8.50 in Santa Fe prior to the LWO. Figure 7 depicts a divergence of average hourly wages between the lowest paid workers in Santa Fe and

Albuquerque following the \$8.50 minimum wage implementation in 2004. The similarity in wage trends for the lowest paid-occupations prior to the LWO further support to our use of the difference-in-differences methodology in evaluating the wage effects of Santa Fe's minimum wage.

Figure 7. Average Hourly Wages for Occupations where 75 percent of workers earned below \$8.50 before LWO.

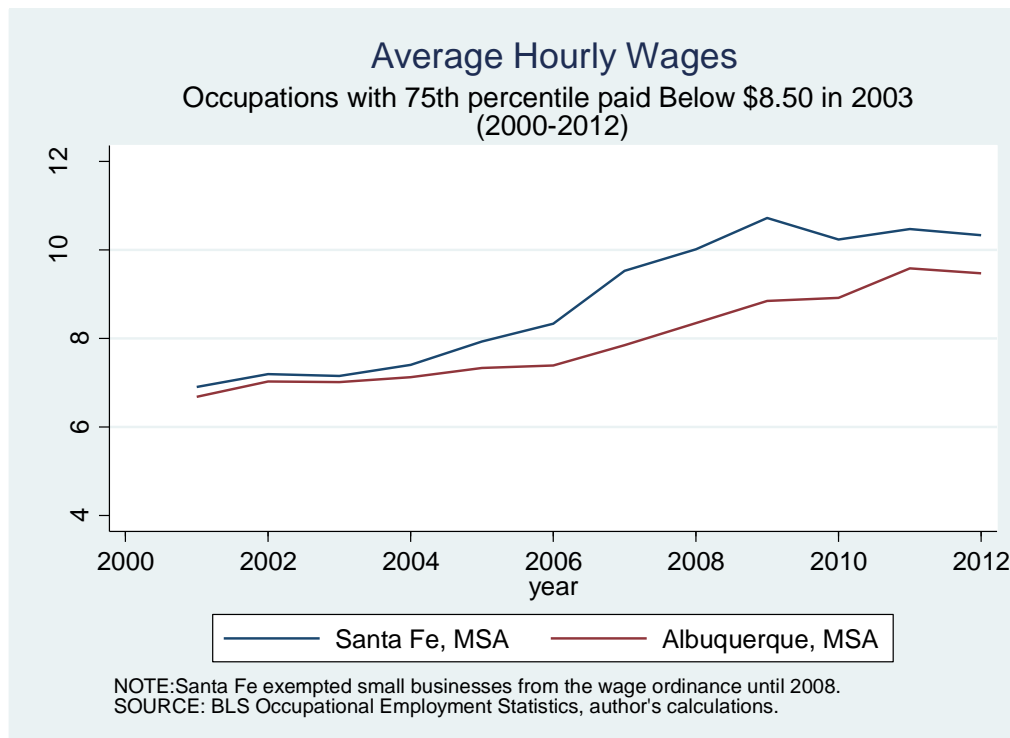
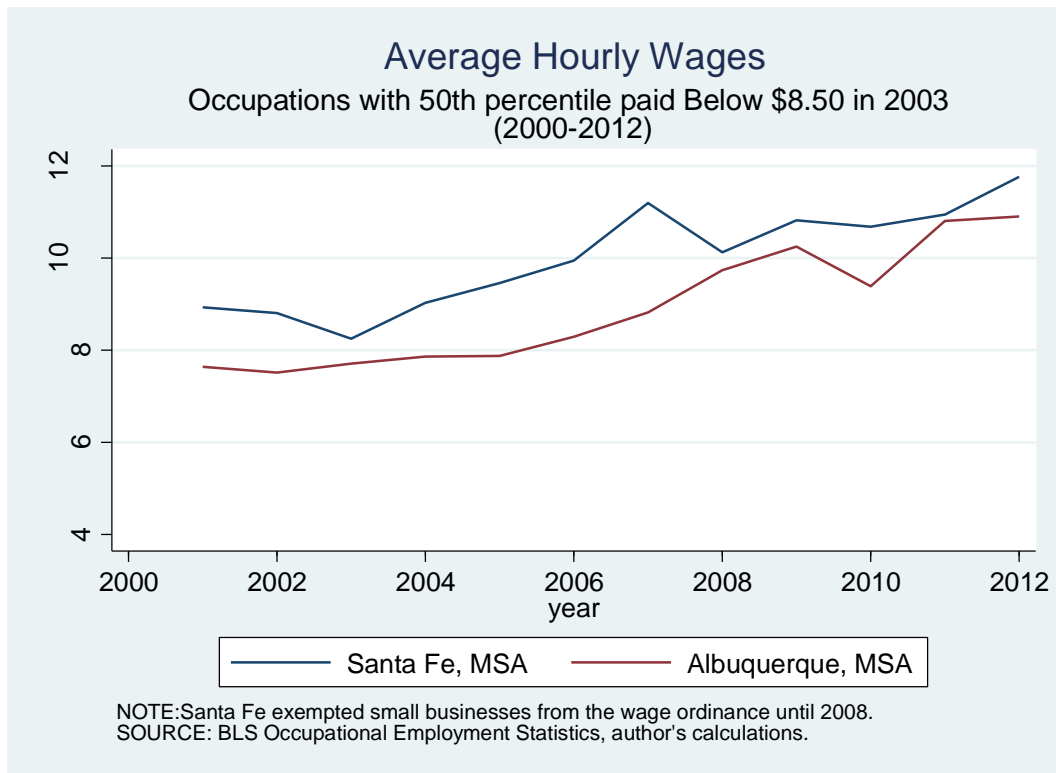


Figure 8 shows average hourly wages for occupation in which at least 50 percent of workers were paid less than \$8.50 in Santa Fe prior to the LWO. Since these occupations have lower concentrations of low-paid workers, the weakening of the pre-policy trend is likely due to more variation in worker pay within the selected occupations. Our testing of these occupations serves to capture any potential employment and wage effects for a larger variety of low-wage occupations likely to be affected by Santa Fe's LWO.

Figure 8. Average Hourly Wages for Occupations where 50 percent of workers earned below \$8.50 before LWO.



According to the BLS Local Area Unemployment Statistics the 12-month change in the unemployment rates for Albuquerque MSA and Santa Fe MSA were 0.4 and 0.5, respectively, in the 12 months between May 2002 and May 2003. Farmington and Las Cruces MSAs exhibited larger 12-month changes in unemployment rates over the same time period; 0.8 and 0.1 respectively.¹⁵ There was also similar growth in the size of the civilian labor forces in the Albuquerque and Santa Fe MSAs. In the 12-month period between May 2002 and May 2003 the civilian labor forces in both the Santa Fe and Albuquerque MSAs fell by .02 and .009 percent, respectively.¹⁶ Labor markets in the

¹⁵ BLS Local Area Unemployment Statistics (LAUS). <http://www.bls.gov/lau/data.htm>. (Accessed February 4, 2015).

¹⁶ BLS Local Area Unemployment Statistics (LAUS). <http://www.bls.gov/lau/data.htm>. (Accessed February 9, 2015).

Santa Fe and Albuquerque MSAs are not likely well-integrated in terms of the mobility of low-wage workers because commuting the 60 miles between the City of Santa Fe and Albuquerque is probably more expensive and costly in terms of time than most low-wage workers are willing or able to bear.

Minimum wage increases

Table 4 shows the changes in Santa Fe and Albuquerque's respective wage policies over the decade between 2004 and 2014. The two largest wage minimum wage differences between Santa Fe and Albuquerque – 65 and 84 percent – occurred in 2004 following Santa Fe's initial minimum wage increase to \$8.50 and in 2006 following Santa Fe's third minimum wage increase from \$9.00 to \$9.50. Albuquerque maintained the federal minimum wage of \$5.15 during the time Santa Fe made three increases in its citywide minimum wage. Our difference analysis exploits these minimum wage differentials by defining two distinct periods in which to evaluate employment changes for low-wage workers in Santa Fe. In the first period we estimated the occupational employment and wage responses to Santa Fe's LWO based upon the minimum wage gap between Santa Fe and Albuquerque. In the second period we estimated the impact of Santa Fe's LWO on occupational employment and wages where the minimum wage gap between Santa Fe and Albuquerque was lower, though still substantial to May 2012. In January of 2007 Albuquerque adopted a citywide minimum wage closing the minimum wage gap between Santa Fe and Albuquerque considerably. Between 2007 and 2012, the minimum wage difference between the two cities ranged from 31 to 41 percent.

Table 4. Minimum Wage Differences for Santa Fe and Albuquerque (2001-2012)

OES Data for May	Date	Santa Fe	Albuquerque	\$ Difference	% Difference
<i>(Before)</i> 2001-2004	May 12, 2004	5.15	5.15	0.00	0%
	June 24, 2004	8.5		3.35	65%
<i>(Period 1)</i> 2005-2006	March 1, 2005	9		3.85	75%
	March 1, 2006	9.5		4.35	84%
<i>(Period 2)</i> 2007-2012	January 1, 2007	9.5	6.75	2.75	41%
	January 1, 2008	9.5	7.15	2.35	33%
	January 1, 2009	9.85	7.5	2.35	31%
	March 1, 2009	9.92	7.5	2.42	32%
	March 1, 2010	10.29	7.5	2.79	37%

Notes: New Mexico Department of Workforce Solutions collect OES survey data for the payroll period including the 12th day of May or November. The BLS publishes annual estimates primarily from the months of May. November estimates are available for 2003 and 2004. Effective January 1, 2008 the City of Santa Fe amended its Minimum wage Ordinance. Beginning January 1, 2009, and each year thereafter, the minimum wage was adjusted upward by an amount corresponding to the previous year's increase, if any, in the consumer price index for the western region for urban wage earners and clerical workers.

Sources: City of Santa Fe's Minimum wage Ordinance AMENDED: 11/28/07 (Ord. 2007-43); The Albuquerque Minimum Wage Ordinance. (Ord. 12-2006); Hockstader, Lee (February 26, 2003). "Santa Fe Wrangles Over Broad 'Minimum wage' Bill; \$8.50 Hourly Minimum Would Cover Most Workers." *The Washington Post*; McGhee, Tom (March 17, 2003). "Minimum wage jumps in Santa Fe \$ 8.50-an-hour law looks to set trend." *The Denver Post*.

Difference analysis

The implicit “treatment” and “control” setup in difference analysis stems from the fundamental challenge of not being able to observe the employment and wage outcomes of Santa Fe’s low-wage workers if Santa Fe had not enacted a citywide minimum wage. Following Card and Krueger (1994, 2000), Dube, Naidu, and Reich (2006), and others, we used a regression difference-in-differences-based approach to measure the impact of Santa Fe’s LWO on occupational employment and wages for workers most likely affected by wage floor policies. However, our analysis includes a third difference, one

which deals with the difference in labor market outcomes between low-wage and *non*-low-wage workers. The inclusion of a third difference allows us to compare the workers in the “treatment” group (low-wage workers in Santa Fe) to workers in our “control” group (higher wage workers in Albuquerque) such that we can measure the relative outcomes of the “treatment” workers with those in the control location. The triple difference estimator therefore gives the pure policy effect of Santa Fe’s LWO on the labor market outcomes of the workers the law targeted, to the exclusion of any labor market effects on groups not targeted or likely to be affected by the minimum wage law. The unit of analysis in our study is the annual MSA occupational employment or wage level.

Model

First, we constructed a binary variable, *SantaFe*, which took a value of one if the occupational employment or wage was recorded in the Santa Fe MSA. Next, we generated a set of dummy variables designed to indicate the time period relative to Santa Fe’s implementing or changing its minimum wage for the years between May 2001 and May 2012. The base period to which our estimates were compared came from the years between May 2001 and May 2003 when both Santa Fe and Albuquerque required only the \$5.15 federal minimum wage. *Period_1* is a dummy variable which equals one if our occupational employment or wage estimate is from the years between May 2004 and May 2006 following Santa Fe’s enactment of its \$8.50 minimum wage and subsequent increases to \$9.00 and to \$9.50. *Period_2* is a dummy variable equal to one if our occupational employment or wage estimates were from the years between May 2007 and May 2012 where minimum wage differentials between Santa Fe and Albuquerque

became smaller due to Albuquerque enacting its own wage legislation. Then we constructed a set of dummy variables designed to indicate whether occupations were to be considered low-wage based on high (75%) concentrations of low-paid workers, and moderate (50%) concentrations of low-paid workers. *BelowMW* is a dummy variable which equals one if it is an occupation wherein at least 75% of workers earned below Santa Fe’s first citywide minimum, \$8.50, before the wage ordinance took effect. *BelowMW2* is a dummy variable which equals one if it is an occupation wherein at least 50% of workers earned below Santa Fe’s initial \$8.50 minimum prior to its enactment.

Our basic model estimating changes in employment for the lowest paid occupations in our study is:

$$\begin{aligned} \ln(y_{j,c,t}) = & \alpha_0 + \alpha_1 \text{SantaFe}_{j,c,t} + \alpha_2 \text{Period 1}_{j,c,t} + \alpha_3 \text{Period 2}_{j,c,t} + \alpha_4 \text{BelowMW}_{j,c,t} \\ & + \alpha_5 (\text{SantaFe} * \text{Period 1})_{j,c,t} + \alpha_6 (\text{SantaFe} * \text{Period 2})_{j,c,t} \\ & + \alpha_7 (\text{SantaFe} * \text{BelowMW})_{j,c,t} + \alpha_8 (\text{Period 1} * \text{BelowMW})_{j,c,t} \\ & + \alpha_9 (\text{Period 2} * \text{BelowMW})_{j,c,t} + \alpha_{10} (\text{SantaFe} * \text{Period 1} * \text{BelowMW})_{j,c,t} \\ & + \alpha_{11} (\text{SantaFe} * \text{Period 2} * \text{BelowMW})_{j,c,t} + \varepsilon_j \end{aligned}$$

where y is labor market outcome (employment or wage) for occupation, j , in location, c , at time, t . The triple difference estimates are given by the coefficients on the last two interaction terms: α_{10} and α_{11} . These estimates show “treatment effect,” that is, what happened to employment for low wage workers in Santa Fe in two periods after the LWO came into effect, relative to higher paid workers, to Albuquerque, and to workers in the pre-LWO period. Our triple difference estimates therefore take the differences not only between Santa Fe MSA and Albuquerque MSA, but also between low-wage workers and non-low-wage workers, and between two distinct “before” and “after” time periods:

before Santa Fe's LWO; after Santa Fe's LWO but before Albuquerque's wage ordinance (*Period_1*); and after Santa Fe raised its minimum wage to \$9.50 and including the years in which Albuquerque adopted minimum wage legislation (*Period_2*).

Adding the third difference, between low wage and other workers, allows us to isolate the effect of the minimum wage law, net of labor market changes that affect all workers.

Chapter 4

Results

Table 5 shows the results of our triple difference estimation for occupations where most workers (75 percent) earned below the \$8.50 minimum wage before Santa Fe enacted its wage ordinance in 2004. The first column shows the approximate percent change in employment, on average, for workers meeting the criteria indicated by the corresponding dummy variable. Table 5 shows that there were no statistically significant changes in employment for the lowest-paid occupations in our sample attributable to Santa Fe's citywide minimum wage ordinance. This suggests that neither the initial 65 percent differential between Santa Fe and Albuquerque's minimum wages, nor the larger 84 percent minimum wage gap prompted employers in Santa Fe to substitute away from workers in low-wage occupations. The second and third columns show the approximate percent change in average and median hourly wages for these occupations. The average hourly wage rose by 0.104 log points or 11 percent and the median wage rose by 0.099 log point or 10 percent following the \$8.50 minimum wage. These positive wage effects for the lowest-paid workers in our sample are statistically significant at the 1 percent level. Positive wage responses also appeared in the second period where the minimum wage gap Santa Fe had over Albuquerque decreased from 41 to 37 percent over five years. Following Santa Fe's increase to a \$9.50 minimum wage, the average hourly wage rose by 0.173 log points or 19 percent and the median wage rose by 0.202 log point or 22 percent. The large wage effects persisting into the second period are likely due, not only in part to the continuing minimum wage differential between the two locations but also to the lag embedded in our occupational wage estimates.

Table 5. Labor Market Effects of Santa Fe's LWO for Occupations with 75th Percentile Paid Below \$8.50
(Standard errors in parentheses)

Variables	ln(Total Employment)	ln(Mean Wage)	ln(Median Wage)
SF×Period_1×BelowMW	0.119 (0.425)	0.104 (0.052)*	0.099 (0.053)+
SF×Period_2×BelowMW	-0.183 (0.327)	0.173 (0.043)**	0.202 (0.042)**
R^2	0.15	0.07	0.07
N	7,988	8,360	8,301
+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$			
SOURCE: BLS Occupational Employment Statistics, author's calculations.			

Table 6 shows the triple-difference estimates for occupations where at least half of workers were paid less than \$8.50 per hour prior to Santa Fe's citywide minimum wage taking effect. These estimates include all of the occupations with high concentrations of low-paid workers analyzed before as well as nine additional occupations where at least half of workers were paid less than the \$8.50 minimum wage. Table 6 shows no statistically significant changes in employment or wages for workers in occupations where half earned less than \$8.50 prior to the LWO. Considering the variation in hourly pay for these occupations it is reasonable to expect less of a response since fewer workers in this group were likely to be affected by Santa Fe's LWO. The lack of an occupational employment response to the LWO among this group of workers is consistent with the result on the lowest-paid-most likely affected workers in our study. The lack of a wage effect is understandable in that more workers in these occupations were paid well above the \$8.50 minimum wage prior to the LWO and therefore less likely to have their hourly wages adjusted due to the wage ordinance.

Table 6. Labor Market Effects of Santa Fe's LWO for Occupations with 50th Percentile Paid Below \$8.50
(Standard errors in parentheses)

Variables	ln(Total Employment)	ln(Mean Wage)	ln(Median Wage)
SF×Period_1×BelowMW2	0.237 (0.383)	0.084 (0.088)	0.092 (0.088)
SF×Period_2×BelowMW2	-0.022 (0.284)	0.068 (0.062)	0.093 (0.059)
R^2	0.15	0.10	0.11
N	7,988	8,360	8,301
+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$			
SOURCE: BLS Occupational Employment Statistics, author's calculations.			

Robustness Checks

We also estimated simple difference-in-differences comparing labor market outcomes between low-wage workers in Santa Fe and Albuquerque before and after the LWO, excluding the comparison with higher wage workers. This showed the relative employment and wages changes among low-wage workers in the two locations. Table 7 shows the results of our simple difference-in-differences for workers in occupations where 75 percent earned less than \$8.50 before the LWO. The first column shows no statistically significant changes in employment for Santa Fe's lowest paid occupations. The second and third columns show the average hourly wage rose by 0.08 log points or 8 percent and the median wage rose by 0.10 log points or 11 percent following Santa Fe's \$8.50 minimum wage. The average hourly wage rose by 0.135 log points or 14 percent and the median wage rose by 0.18 log points or 20 percent following Santa Fe's \$9.50 minimum wage.

Table 7. Simple Difference-in-Differences for Occupations with 75th Percentile Paid Below \$8.50
(Standard errors in parentheses)

Variables	ln(Total Employment)	ln(Mean Wage)	ln(Median Wage)
SF×Period_1	-0.134 (0.429)	0.081 (0.042)+	0.101 (0.045)*
SF×Period_2	-0.281 (0.334)	0.135 (0.037)**	0.181 (0.036)**
R^2	0.50	0.74	0.75
N	109	109	109
+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$			
SOURCE: BLS Occupational Employment Statistics, author's calculations.			

Table 8 shows our simple difference-in-differences estimates for occupations where 50 percent of workers were paid below \$8.50 before the LWO. Again, we find no changes in employment for low-wage occupations in Santa Fe when compared to Albuquerque. Average hourly wages for the lowest-paid occupations rose by 0.097 log points or 10 percent following Santa Fe's increase to a \$9.50 minimum wage. This positive wage effect is statistically significant at the 5 percent level.

Table 8. Simple Difference-in-Differences for Occupations with 50th Percentile Paid Below \$8.50
(Standard errors in parentheses)

Variables	ln(Total Employment)	ln(Mean Wage)	ln(Median Wage)
SF×Period_1	-0.026 (0.377)	0.057 (0.084)	0.089 (0.085)
SF×Period_2	-0.117 (0.285)	0.046 (0.054)	0.097 (0.049)*
R^2	0.37	0.23	0.27
N	280	280	280
+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$			
SOURCE: BLS Occupational Employment Statistics, author's calculations.			

In addition, we also estimated our triple differences for each period separately. We found no employment or wage effects for low-wage workers in the first period representing the year following Santa Fe's initial \$8.50 minimum wage. We also found no employment or wage effects for workers in occupations where the 50th percentile was

paid below \$8.50 prior to the LWO. However, we did find positive wage effects for workers in occupations where the 75th percentile in the period following Santa Fe's increase to a \$9.50 minimum wage. Table 9 shows the average hourly wage for workers in the lowest-paid occupations rose by 0.138 log points or 15 percent and the median wage rose by 0.169 log points or 18 percent. The positive wage effect is statistically significant at the 1 percent level.

Table 9. Labor market effects of Santa Fe's \$8.50 Minimum Wage for Occupations where 75th Percentile Paid below \$8.50 (Standard errors in parentheses)

Variables	ln(Total Employment)	ln(Mean Wage)	ln(Median Wage)
SF×Period_2×BelowMW	-0.225 (0.301)	0.138 (0.042)**	0.169 (0.041)**
R^2	0.15	0.06	0.07
N	7,988	8,360	8,301
+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$			
SOURCE: BLS Occupational Employment Statistics, author's calculations.			

Since we estimated our dependent variables are in logs rather than in levels there is a retransformation bias associated with our converted percentage approximations. The standard errors featured in each of the results tables are for the log point changes only and do not apply to the approximate percentage changes we calculated. We used generalized linear modeling (GLM) to estimate labor market outcomes for low-wage workers in levels in order to compare the approximate percentage changes we calculated from our original semi-log model with the actual percentage changes from our generalized linear model. The generalized linear model minimizes the retransformation bias by giving consistent estimators based on the linear exponential family in our original semi-log

model¹⁷. Table 10 shows our GLM estimators in levels and confirm the results from our triple difference estimation in logs. The average hourly wage for the lowest paid workers rose by 11.7 percent and their median wage rose by 10.7 percent following Santa Fe's initial \$8.50 minimum wage. Our earlier approximations of the log point changes were 11 and 10 percent respectively. These results are statistically significant at the 5 and 10 percent levels. Following Santa Fe's increase to a \$9.50 minimum wage, the average hourly wage of the lowest-paid workers in our study rose by 18.7 percent and the median wage rose by 21.3 percent. Our earlier percent change approximations were 19 and 22 percent respectively. These positive wage effects were statistically significant at the 1 percent level. Our GLM treatment of occupations with the 50th percentile paid below \$8.50 again showed no changes in their employment or wages following Santa Fe's minimum wage.

Table 10. Generalized Linear Model for Labor Market Effects of Santa Fe's LWO for Occupations with 75th percentile Paid Below \$8.50 (Standard errors in parentheses)

Variables	Total Employment	Mean Hourly	Median Hourly
SF×Period_1×BelowMW	0.083 (0.446)	0.117 (0.057)*	0.107 (0.056)+
SF×Period_2×BelowMW	-0.164 (0.341)	0.187 (0.047)**	0.213 (0.043)**
<i>N</i>	7,988	8,360	8,301
+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$			
SOURCE: BLS Occupational Employment Statistics, author's calculations.			

¹⁷ I would like to thank David van der Goes, PhD for suggesting GLM as an approach to mitigating the retransformation bias.

Chapter 5

Discussion

Overall, this study found no evidence of employment loss for workers that were the most likely to be affected by Santa Fe's minimum wage. By evaluating the effects of Santa Fe's wage ordinance on occupational employment, this study analyzed changes in employment and wages resulting from implementation of Santa Fe's citywide for workers in occupations with high concentrations of low-paid workers and for workers in occupations with moderate concentrations of low-paid workers. By using occupational employment estimates across industry and worker type, we examined how Santa Fe increasing its minimum wage impacted the labor market for workers regardless of worker gender, age and industry. This result provides valuable insights into how employers in Santa Fe adjusted to higher minimum wages overall, and suggest that firms absorbed the higher employment costs by taking actions other than laying off low-wage workers.

Because establishments are reporting payrolls in OES data, rather than providing lists of specific workers, we cannot assume that workers employed in a low-wage occupation in one period are the same workers reporting employment in low-wage occupations in the next period. The consequence of this is that we cannot say that individual workers in the lowest-paid occupations themselves remained employed following Santa Fe's increase in its citywide minimum wage. This is primarily due to the fact that the OES data used in our study is a repeated cross section of occupational employment rather than a longitudinal survey. Although the results of this study are arguably more generalizable than previous studies of Santa Fe's wage ordinance in that the low-paid workers in our sample are not restricted by age, gender or industry, the overall effect we found cannot be interpreted as showing actual wage gains experienced by any individual worker.

Our estimates show that workers in low-wage occupations employed in Santa Fe prior to the LWO experienced no employment losses following either the initial \$8.50 minimum wage or the subsequent increase to \$9.50. These results contradict the suggestions by critics of the municipal wage floor that minimum wages unequivocally cause job loss for the likely affected workers. Occupational employment remained stable in the low-wage labor markets of Santa Fe and the surrounding areas following adoption of a city wide minimum wage.

Our estimates show that businesses in Santa Fe MSA increased average hourly pay rates for workers in low-wage occupations, but only after the increase to a citywide minimum wage of \$9.50. The gains in average hourly wages experienced by these workers following Santa Fe's LWO appear to have taken hold alongside a closing minimum wage gap between Santa Fe and Albuquerque.

The results of our study suggest that workers in occupations most likely affected by a municipal wage floor did not suffer the adverse employment effects suggested by opponents to minimum wages. Further, our estimates suggest that, in fact, low-wage occupations benefitted substantially in terms of hourly wages affirming the aim of living wage ordinances – to increase the wages of low-wage workers without harming employment.

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