Policy and Job Quality:
The Effects of State Unemployment Insurance Taxes and Workers' Compensation Insurance on Temporary Help Services Employment Concentration

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Abstract of Dissertation

Policy and Job Quality:
The Effects of State Unemployment Insurance Taxes and Workers' Compensation Insurance on Temporary Help Services Employment Concentration

A state and year fixed effects model is developed to analyze the influence of state unemployment insurance taxes and state workers' compensation costs on temporary help services employment concentration. Using state level panel data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages, state unemployment insurance tax factors are found to have significant effects on temporary help services employment concentration. Workers' compensation costs had a significant effect on temporary help services employment concentration during the Great Recession, but not before. Because temporary help services jobs represent low quality jobs relative to traditional direct-hire jobs, state unemployment insurance taxes, through their impact on temporary help services employment concentration, contribute to a decrease in job quality. The results of the analysis suggest that the effects of policy factors on job quality merit further analysis.

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Chapter 1: Introduction

On any given day in the United States, approximately 2 percent of all jobs held are temporary help services (THS) jobs. The number of workers who hold a THS job over the course of a year is a multiple of that figure. In 2007, for example, an estimated 8 percent of the U.S. workforce held a THS job. [Berchem 2012] Women and minorities are more highly represented in the temporary help services workforce than in the traditional workforce.[1] Assessments of the job quality of these THS jobs and the welfare implications of holding a THS job have been more negative than positive.[2] Workers' own assessments of the job quality of THS jobs have been substantially more negative than positive. Over two-thirds of THS workers report that they would prefer to hold a traditional job rather than a THS position.[3]

What causes employers to create a temporary help services job rather than a worker-preferred traditional job? Researchers have investigated microeconomic drivers of the demand for THS employment, as well as the relationship between macroeconomic variables and THS industry growth. What have not been considered in the United States context, however, are the possible ways in which government policy may be influencing employers' decisions to hire THS workers in place of traditional workers. This

[1] From Table 6 of the February 2005 Current Population Survey Contingent and Alternative Employment Arrangements Supplement conducted by the Census Bureau for the Bureau of Labor Statistics, located at http://www.bls.gov/news.release/conemp.t08.htm, accessed on 12/4/2013.
[2] See, for example, Kilcoyne 2005, Heinrich et al 2005, Autor and Houseman 2010, and Kalleberg 2011.
[3] From Table 11 of the February 2005 Current Population Survey Contingent and Alternative Employment Arrangements Supplement conducted by the Census Bureau for the Bureau of Labor Statistics, located at Http://www.bls.gov/news.release/conemp.t08.htm, accessed on 12/4/2013.

dissertation takes a step toward understanding whether specific government policies cause increases in temporary help services employment concentration.

The first policy area to be considered is unemployment insurance. Each state defines and administers its own unemployment insurance system. State unemployment insurance tax rates and criteria for determining rates vary by state. As a result, the unemployment insurance tax rates that employers face differ across states. The dissertation analyzes whether variation in average effective tax rates across states and over time influences temporary help services employment concentration.

A second policy area considered is workers' compensation. As with unemployment insurance, workers' compensation programs are state-defined and administered, with average effective workers' compensation costs varying across states and over time. The dissertation investigates a possible relationship between workers' compensation insurance costs and THS employment concentration.

These analyses are based on heretofore unexplained variation in temporary help services employment concentration across states. From 1990 to 2011, the concentration of THS workers in the state workforce ranged from a minimum of 0.18 percent in Montana to a maximum of 3.88 percent in Delaware. Data on temporary help services employment by state used for the dissertation analysis were drawn from the Quarterly Census of Employment and Wages (QCEW) of the Bureau of Labor Statistics. The dissertation research is the first to use QCEW data to analyze THS employment. It is also the first attempt to evaluate the effects of government labor policies in the United States on temporary help services employment.

Study of the effects of policies on temporary help services employment could consider either the proportion THS employment represents of total employment – a relative measure – or the total quantity of THS employment – an absolute measure – as the outcome variable. While both are of interest, the dissertation gives primary focus to the proportion of THS employment, referred to as THS employment concentration. Changes in THS concentration are an indicator of changes in the relative benefit of THS employment versus traditional employment in employers' decision algorithm. Decisions regarding the quantity of THS workers to hire, like decisions regarding the quantity of all workers to hire, are driven fundamentally by changes in product demand. The decision whether to hire THS workers or traditional workers to meet that demand, by contrast, is based, inter alia, on fixed costs of hiring, costs of termination, wage inflexibility, non-wage costs, and possibly policy factors. The dissertation centers on determining whether government policies affect the proportion of THS workers out of all workers that employers decide to hire. In addition, the dissertation touches on the relationship between policy factors and absolute levels of THS employment.

The dissertation is organized as follows. This introductory first chapter provides a description and history of THS employment; discusses job quality, worker welfare, and THS employment; and describes briefly state unemployment insurance and workers' compensation systems. The second chapter discusses theory relevant to the effects of government policy costs on temporary help services employment and sets forth resultant hypotheses regarding unemployment insurance and workers' compensation. The third chapter presents a review of literature regarding THS employment. The fourth chapter describes the methodology used to analyze the effects of unemployment insurance taxes

and workers' compensation insurance costs on THS employment concentration and the data. The fifth chapter presents the results of the analysis. Lastly, the sixth chapter discusses policy implications and concludes the dissertation.

Temporary Help Services Employment Description and History

The hallmark of temporary help services employment is its triangular relationship. [Gonos 1997] An employer with an open position contracts with a temporary help services agency, which, in turn, contracts with a worker. The relevant legal context for regulating the relationship differs from that of direct hire workers. State legislation specific to temporary help services agencies varies, but generally defines an employment services agency, sets out entry licensing requirements, and reiterates the need for compliance with federal and state labor laws and tax requirements. The THS agency, sometimes referred to as a "staffing agency," usually becomes the legal "employer of record" in the place of the firm where the worker is placed. As the Securities and Exchange Commission Filing made by THS agency Robert Half International explains, "Employees placed by the Company on assignment with clients are the Company's employees for all purposes while they are working on assignments. The Company pays the related costs of employment, such as workers' compensation insurance, state and federal unemployment taxes, social security, and certain fringe benefits."[4]

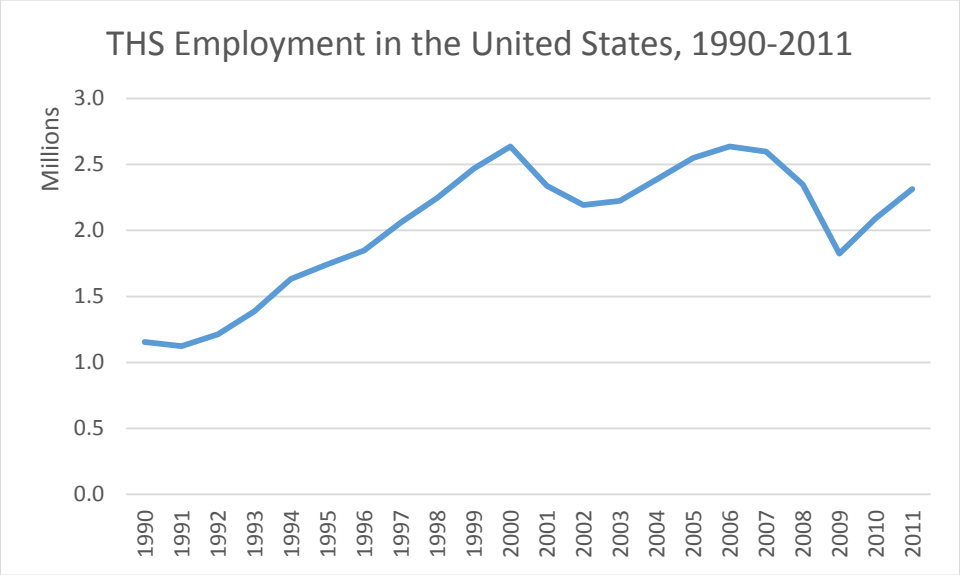
The temporary help services industry did not start out the way it is now. The temporary help services industry was strictly regulated, including fees, by states through about 1960. THS agencies were considered intermediaries, rather than employers legally

[4] From the Robert Half International 10-K SEC Filing 2/15/2013, Item1: Business, p.4, located at http://finance.yahoo.com/q/sec?s=RHI+SEC+Filings, accessed 12/4/2013.

permitted to relieve client firms of their legal obligations as employer of record. During the 1960s and early 1970s, in response to lobbying by the THS industry, states passed legislation exempting temporary help services agencies from employment agency regulations and designating temporary help services agencies as legal employers. Deregulation and the policy shift to allow the triangulation of the employment relationship set the legal stage for growth of the private temporary help services sector. [Gonos 1997]

During the 1950s, the THS industry employed only 20,000 workers, primarily in clerical and factory positions where tasks were highly routinized. [Gannon 1984] Temporary help services employment increased tenfold, to about 200,000 in the early 1970s, representing just under 0.3 percent of total U.S. employment. [Luo, Mann, and Holden 2010] The number of THS positions in office and administrative support occupations grew to represent most THS employment during the mid-1980s. [Carey and Hazelbaker 1986] Use of THS agencies to procure workers became more widespread during the 1980s, with THS employment more than doubling between 1982 and 1988. [Golden and Appelbaum 1992]

Figure 1



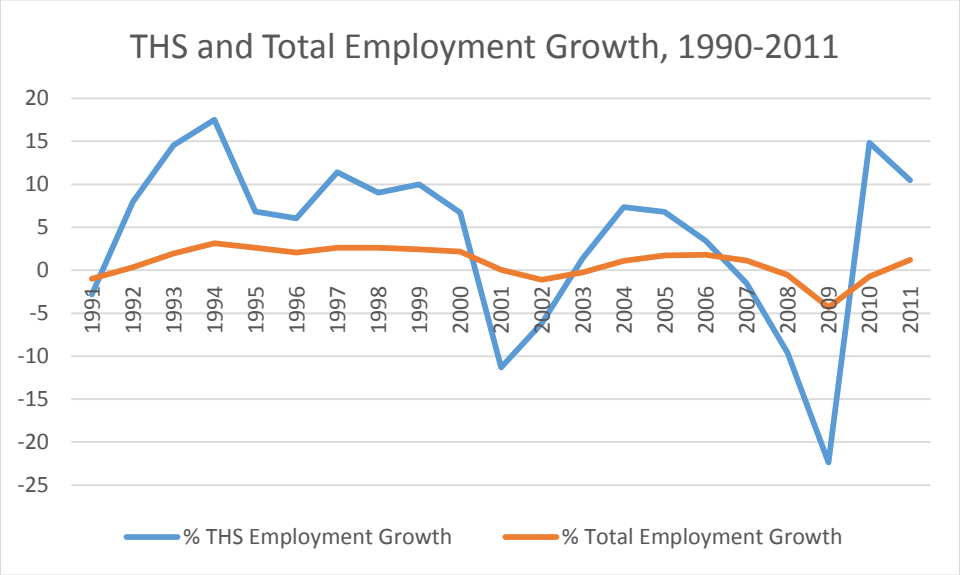
Source: Bureau of Labor Statistics Current Employment Statistics Survey

Employers increased their use of temporary employment services workers throughout the economic expansion of the 1990s, as shown in Figure 1. A survey of manufacturing employers in the mid-1990s found that 46 percent used workers from temporary help services agencies. [Houseman 1997] In 2000, an estimated 43 percent of establishments with more than 20 workers across all sectors employed at least one THS worker. [Capelli and Keller 2013]

While the temporary help services industry grew rapidly during the 1990s, recession at the turn of the millennium brought a sharp downturn in total THS employment. Further, temporary help services labor proved more volatile than standard employment from 2000 to the present. From 1990 to 2011, growth in THS services

ranged from – 22.4 percent to 17.6 percent, compared to non-farm employment growth ranging from -4.3 percent to 3.1 percent, as illustrated in Figure 2.[5]

Figure 2



Data Source: Bureau of Labor Statistics Current Employment Statistics

The temporary help services industry is competitive and highly fragmented, with approximately 100 competitors operating nationally and an estimated 10,000 smaller companies competing at local levels. [6] At least 15 temporary help services agencies, known within the industry as "staffing" agencies, list their stock for re-sale on publicly-traded stock exchanges.[7] Some THS agencies focus on supplying workers in specialized occupations, such as nursing, accounting, or engineering. Others are diversified,

[5] Author's calculations, based on data from the Bureau of Labor Statistics Current Employment Statistics database at http://www.bls.gov/ces/data.htm, accessed 10/1/2013.
[6] From the Kelly Services Inc. 10-K SEC Filing of 2/14/2013, located at http://biz.yahoo.com/e/130214/kelya10-k.html, accessed 12/3/2013.
[7] Author's estimate, based on reviews of websites of public corporations listed in the Yahoo Finance "Staffing and Outsourcing Services" Industry Index, located at http://biz.yahoo.com/ic/764_cl_pub.html, accessed 12/3/2103.

providing workers to any industry. At the low end, some THS agencies act as "body shops" that provide unskilled day labor to client employers.

The Census Bureau's Third National Establishment Survey undertaken in 2000-2001 generated estimates of the occupational breakdown of THS employment at that time. Of all THS workers, 44 percent worked in production jobs, 41 percent in office jobs, 10 percent in technical jobs, 4 percent in managerial and professional jobs, and 1 percent in supervisory jobs.[8] Use of THS workers in manufacturing increased further during the early 2000s. Out of all temporary help services workers, an estimated 48 percent were in blue-collar jobs by 2004. [Dey, Houseman, and Polivka 2006]

A 2005 Contingent and Alternative Employment Arrangements Supplement to the Bureau of Labor Statistics' Current Population Survey yielded estimates of THS worker demographics, presented in Table 1 below. [9] Women were more highly represented in the temporary help services workforce than in the "traditional" workforce. "Traditional" work in Table 1 below refers to employment arrangements where workers are directly hired. African American and Latino workers also represented a higher share of THS workers than traditional workers.

[8] From Cappelli and Keller 2013, Table 3.
[9] From Table 6 of the February 2005 Current Population Survey Contingent and Alternative Employment Arrangements Supplement conducted by the Census Bureau for the Bureau of Labor Statistics, located at http://www.bls.gov/news.release/conemp.t08.htm, accessed on 12/4/2013.

Table 1
2005 THS Worker Demographics

Sex and Race/Ethnicity	THS Workers	Traditional Workers
Men	47.2 %	52.2 %
Women	52.8 %	47.8 %
White	69.0 %	82.4 %
Black or African American	22.7 %	10.9 %
Asian	5.2 %	4.5 %
Hispanic or Latino Ethnicity	21.0 %	13.1 %

Source: Bureau of Labor Statistics 2005 Current Population Survey Contingent Employment Supplement

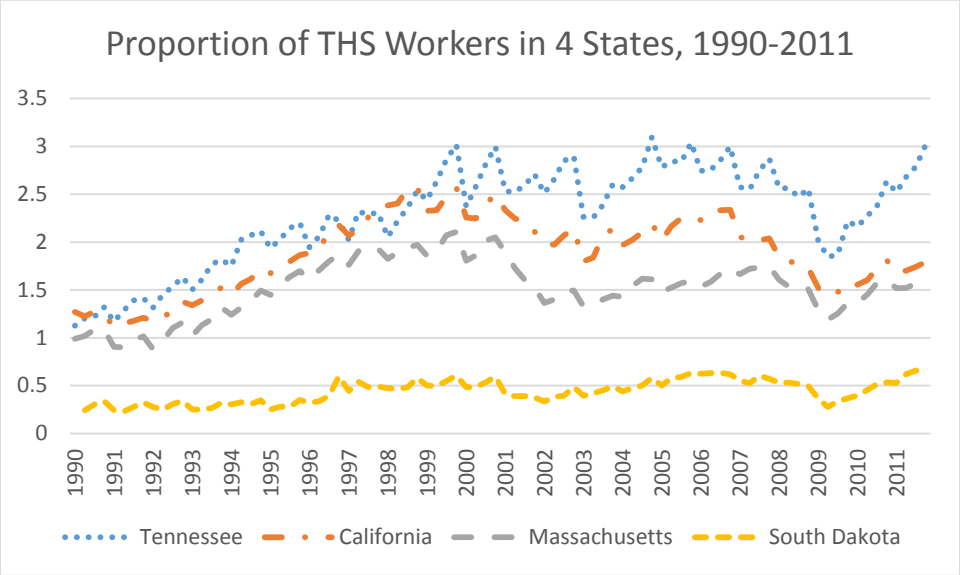
The duration of temporary help services jobs can vary widely. According to the American Staffing Association, "While specific jobs may last from a few hours to several years, the best estimates for the average tenure of temporary employees range from three to four months."[10] The mean tenure in 2011 was 11.3 weeks and in 2012 was 13.2 weeks.[11] A 2006 survey of over 13,000 THS workers found that 77 reported that the opportunity to find a permanent job was a key motivator in accepting a temporary help services position.[12] In other words, over three-fourths of surveyed THS workers hoped that the THS position would serve as a stepping stone to a permanent position. Nearly half of surveyed THS workers reported that they would continue to accept temporary help services jobs until they secured a permanent job. By contrast, nearly one-fourth of surveyed THS workers indicated they had chosen temporary work for lifestyle reasons and planned to continue working in the THS sector.

While the above discussion and data present a national picture of the temporary help services industry, the industry is not homogeneous across U.S. states. The

[10] From the website of the American Staffing Association at http://www.americanstaffing.net/statistics/faqs.cfm, accessed on 1/9/2014.
[11] From the website of the American Staffing Association at http://www.americanstaffing.net/statistics/fact_sheets.cfm, accessed on 1/9/2014.
[12] From the website of the American Staffing Association at http://www.americanstaffing.net/statistics/top_line_survey_results.cfm accessed on 1/9/2014.

representation of THS workers in the workforce varies substantially across states. (For means, minima, and maxima of the THS concentration across all states, see Appendix I.) For example, the proportion of THS workers employed in Alaska, South Dakota, Vermont, and Wyoming averaged well under 1 percent of all employment from 1990 to 2011. By contrast, the proportion of THS workers was more than twice as high in Georgia, Illinois, South Carolina, and Tennessee, with each averaging greater than 2% employment concentration. Figure 3 below shows the variation in the proportion of temporary help services employment of all employment across four states, selected to illustrate interstate variation, from 1990 to 2011.

Figure 3



Source: Bureau of Labor Statistics Quarterly Census of Employment and Wages

Although regulated primarily by states, the temporary help services industry attracted the attention of federal lawmakers in 2004 when implicated as one of several industries possibly involved in the practice of state unemployment tax evasion known as

"SUTA dumping."[13] The practice of SUTA dumping involves assignment of employees to shell or affiliated corporations in order to pay lower unemployment insurance tax rates on the wages of such employees. The SUTA Dumping Prevention Act became U.S. law on August 9, 2004. In 2013, the federal government again turned its attention to the temporary help services industry, this time in response to highly publicized on-the-job fatalities of THS workers. The (OSHA) reported that it had "…concerns that some employers may use temporary workers as a way to avoid meeting all their compliance obligations under the OSH Act and other worker protection laws."[14] The Occupational Safety and Health Administration launched an initiative intended to protect THS workers from undue worksite hazards.

Employers use THS agencies to hire workers instead of hiring workers directly for many reasons, detailed in the literature review chapter. The actions of the federal government cited above suggest the concern that avoidance of costs associated with policies such as state unemployment insurance and worker safety compliance requirements can be counted among those reasons. In these cases, the hiring of THS workers in place of traditional workers would be a negative and, in fact, perverse outcome. Policies intended to provide worker safety and unemployment benefits to improve worker security would be leading to employer creation of more dangerous, less secure and, as discussed in the next section, lower quality jobs.

[13] U.S. Department of Labor Employment and Training Administration Advisory Memo located at http://workforcesecurity.doleta.gov/dmstree/uipl/uipl2k2/uipl_3402.htm, accessed 12/3/2013.
[14] From the U.S. Department of Labor Occupational Safety and Health Administration website at https://www.osha.gov/temp_workers/index.html, accessed 12/7/2013.

Job Quality, Worker Welfare, and THS Employment

The answer to the question of whether THS employment is "good" or "bad" is complex. The literature review includes a vein of scholarship suggesting that the THS industry may perform important labor intermediation functions and a useful macroeconomic role. In these ways, the THS industry performs beneficial functions. The THS industry can be assessed, however, not only at the macroeconomic level, but also at the microeconomic level. In particular, the job quality of THS employment merits examination. In addition, comment on the benefit of a THS job compared to unemployment is warranted. The job quality of THS jobs compared to traditional jobs can be evaluated in three ways: comparing the characteristics of THS jobs to those of traditional jobs; qualitatively assessing THS jobs; and empirically measuring the effects of holding a THS job on the welfare of workers.

Osterman [2013] proposes the breakdown of job quality characteristics into three key elements: compensation, work content, and the nature of the employment contract. In terms of compensation, THS jobs are inferior to traditional jobs. The hourly wages of THS workers were found to be substantially lower than those of traditional workers in 2004 in all occupations except nursing and computer programming. [Kilcoyne 2005]

Work content or substance refers to the skill level, control, and stress of a job. The relative skill levels of THS jobs and traditional jobs have not been evaluated. One study, however, found that employers do not hire THS employees for positions that require firm-specific skills or knowledge. [Masters and Miles 2002] This suggests that the content of a THS job is likely to be less skill intensive along the dimension of firm-specific skills than the content of a traditional job. As for control, it is unlikely that a THS

worker has as great of a voice in the employing organization than a traditional worker. Given their greater experience from longer tenure, traditional workers may be more likely to be given discretion, which is considered an element of control. As for stress, the literature does not comment on the relative stress of tasks undertaken by THS workers versus traditional workers. The uncertainty regarding job continuation faced by THS workers, however, can be considered a form of stress. Overall, the work content of THs jobs can be considered a negative factor with regard to job quality compared to traditional jobs.

In terms of the nature of the employment contract, the quality of a traditional job exceeds that of the THS job. The mutual commitment of a THS employment relationship falls short of that of a traditional work relationship. The rise of THS employment and other non-standard employment arrangements is viewed as an indicator of the erosion of the employment contract and, thereby, of job quality. [Osterman 2013] Hence, all in all, based on examination of compensation, work content, and the nature of the employment contract, the job quality of temporary help services employment is lower than that of traditional employment. Workers themselves have indicated that the quality of THS jobs is lower than traditional jobs in that over two-thirds of THS workers say they would prefer a traditional job.[15]

Researchers who have undertaken qualitative assessments of THS employment in terms of worker compensation and career possibilities conclude that THS jobs are low quality jobs. [Kalleberg 2000 and 2011; Smith 1998; Booth et al. 2002] Kalleberg [2000

[15]From Table 11 of the February 2005 Current Population Survey Contingent and Alternative Employment Arrangements Supplement conducted by the Census Bureau for the Bureau of Labor Statistics, located at Http://www.bls.gov/news.release/conemp.t08.htm, accessed on 12/4/2013.

and 2011] determines that THS jobs fit the characterization of so-called “bad jobs” as they offer low pay, minimal benefits, insecurity, and negligible advancement opportunities. Smith [1998] found THS jobs exploitative of entry level workers and their occupational goals. Weil [2011] describes labor standards violations and the poor enforcement of labor standards in employment relationships that are intermediated by third parties rather than contracted directly between major manufacturers and service providers and employees. Yet, THS workers reveal their preference for THS jobs over unemployment by accepting THS jobs. A small minority of workers prefer THS jobs to direct hire jobs. Hence, THS jobs may be “bad jobs” that are nevertheless better than no jobs and, in some instances, may not be “bad jobs” for some workers.

Studies of the effects of holding a temporary job on the welfare of low income workers over time yield ambiguous findings. Andersson et al [2009] confirm that THS workers have lower earnings than traditional workers while working for the THS agency, but also show that the effects on workers of holding a THS job on subsequent earning are mixed. If the worker, continues THS employment, earnings effects continue to be negative. A low wage worker who succeeds in obtaining a stable traditional job after the THS job, however, will generally have higher earnings, mainly due to improved access to higher wage employers. In this way, for a subset of low wage earners, THS employment can serve as a ”stepping stone” to higher earnings.

One study found that Milwaukee and Silicon Valley workers who held THS jobs obtained higher earnings in immediately subsequent jobs. [Benner et al 2007] Another study found that Detroit workers receiving Temporary Assistance to Needy Families (TANF) who held THS jobs had higher earnings in the short term. These gave way,

however, to lower earnings, less frequent employment, and higher welfare recidivism in the longer term. [Autor and Houseman 2005] Missouri and North Carolina welfare recipients who worked in THS jobs had lower initial wages, faster subsequent wage growth, and then, after two years, slightly lower wages, similar unemployment rates, and slightly higher public assistance recidivism compared to workers who initially secured traditional jobs. [Heinrich et al. 2005]

Overall, in the medium to long term, although with some exceptions, THS employment yields worse welfare outcomes for low wage workers than traditional employment. The job quality of THS jobs, based on qualitative assessment and evaluation of job characteristics, can be considered inferior to that of traditional jobs. While creation of a THS job rather than no job is likely to be an improvement, the creation of a THS job in lieu of a traditional job can be considered a negative outcome for the worker.

Unemployment Insurance and Workers' Compensation

This dissertation investigates whether state unemployment insurance and workers' compensation insurance encourage the creation of THS jobs in the place of traditional jobs. More specifically, it analyzes the effects of state unemployment insurance and workers' compensation insurance costs to employers on the concentration of temporary help services workers in the state. The rationale for the selection of these factors is discussed in the following chapter on theory. This section provides relevant background regarding unemployment insurance and worker's compensation that helps set the stage for the analysis undertaken.

Unemployment Insurance. Unemployment insurance provides temporary financial benefits to workers who become unemployed involuntarily and who meet a set of state determined criteria. [16] Unemployment insurance programs aim to help unemployed workers maintain a degree of consumption and enable more efficient job choices during unemployment, while minimizing the adverse incentives from partial wage replacement. [Nicholson and Needels 2006] Many states pay 50% of average prior weekly earnings up to a defined ceiling for up to a maximum of 26 weeks. [17,18] Each state defines and administers its own unemployment compensation program.

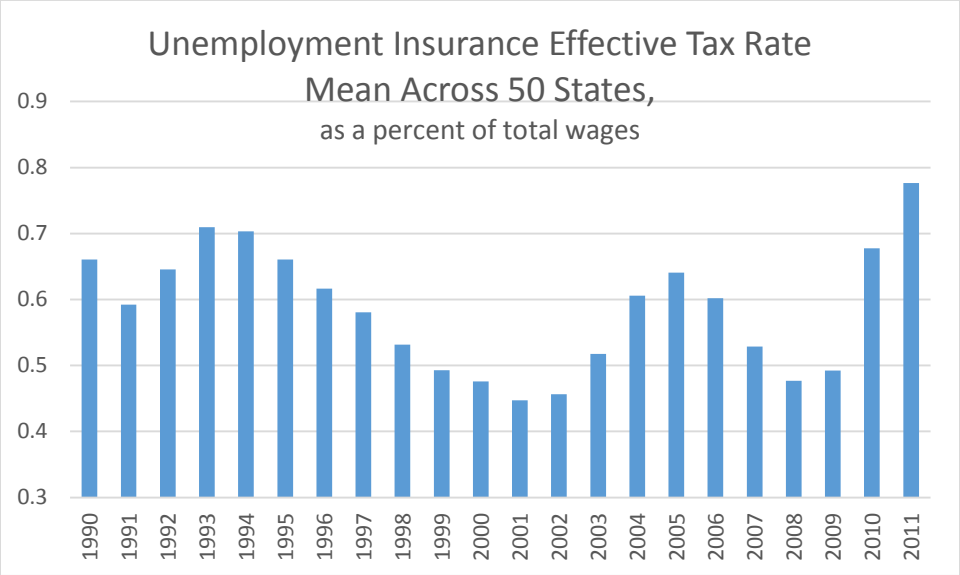
The federal government, however, sets some guidelines regarding unemployment insurance taxation and oversees state unemployment insurance trust funds. Under the Federal Unemployment Tax Act (FUTA), a 6.0 percent federal tax is levied on employers on the first $7,000 of earnings per worker, with a credit of 5.4 percent to employers who pay state taxes on time. The funds are used to cover federal and state unemployment insurance program costs, the federal share of extended employment benefits, and the fund that states can draw on in case the state unemployment insurance trust fund is underfunded. Federal regulations stipulate that states which do not repay such loans do not receive the full credit. FUTA also sets minimum state unemployment insurance tax

[16] The background discussion of unemployment insurance draws extensively on the Department of Labor publication "Comparison of State Unemployment Insurance Laws 2011", located at http://workforcesecurity.doleta.gov/unemploy/pdf/uilawcompar/2011/coverage.pdf, accessed on 12/16/13.
[17] Exceptions in 2011 were Montana, which paid up to 28 weeks, and Massachusetts, which paid up to 30 weeks. Data are from Table 3-11: Benefit Entitlement and Duration of Benefits from the Department of Labor publication "Comparison of State Unemployment Insurance Laws 2011." The table is located at http://www.ows.doleta.gov/unemploy/pdf/uilawcompar/2011/monetary.pdf, accessed last on 2/24/14. After the 1990 to 2011 study period ended, five states – Georgia, Michigan, Montana, North Carolina, and South Carolina - have reduced the maximum to 20 weeks.
[18] The federal government also financed programs granting emergency extensions of benefits to state unemployment insurance recipients at points during the study period of 13 to 20 weeks. These include the Extended Benefits program, periodic Emergency Unemployment Compensation programs, and the American Recovery and Reinvestment Act of 2009.

rates of 5.4 percent to receive the full credit. Finally, while states set their entitlement policies without federal requirements or guidelines, federal law requires that states enable recipients to voluntarily have federal income taxes withheld.

The state unemployment insurance systems are primarily funded through a tax on employers.[19] Employers paid $44.5 billion in unemployment insurance taxes in 2011.[20] By state, the mean average effective state unemployment insurance tax rate over the period 1990-2011 ranged from under 30 cents per $100 of total wages in South Dakota and Virginia to over 1 dollar per $100 of total wages in Oregon and Alaska.[21] [For unemployment insurance average effective tax rates by state, see Appendix Table II.]

Figure 4



Source: Author's calculations based on data provided by DOLETA[22]

[19] In Alaska, New Jersey, and Pennsylvania, employees also pay unemployment insurance taxes.
[20] Total from Department of Labor Employment and Training Administration (DOLETA) data provided 5/5/14.
[21] Author's calculations based on data provided by DOLETA 5/5/14.
[22] DOLETA is the U.S. Department of Labor Employment and Training Administration.

Over time, the mean of the effective state unemployment insurance tax rates across the 50 states ranged from 45 cents per $100 of total wages in 2001 to 78 cents per $100 of total wages in 2011. [See Figure 4.] The mean increased in the years following the recessions ending March 1991, November 2001, and June 2009.[23] Many states raised tax rates to replenish state Unemployment Insurance Trust Funds depleted by increased unemployment insurance claims during the economic downturns.

An employer is subject to unemployment insurance tax liability and its qualifying employees are covered by unemployment insurance if the employer meets certain criteria set by the states. In approximately half of the states, an employer must have paid wages of $1,500 or more during any calendar quarter in the current or immediately preceding calendar year or have employed 1 or more workers on at least 1 day in each of 20 weeks during the current or immediately preceding calendar year, consistent with FUTA requirements. Some states set lower thresholds for wages paid, and several require that employers who have workers for any number of weeks are required to pay unemployment insurance tax.

THS agencies are subject to the same criteria and regulations as all other employers with regard to unemployment insurance. As is the case with all employers, temporary help services agencies that meet the criteria set by a state are obligated to pay state unemployment insurance taxes. Given the criteria, all but the smallest THS agencies would pay state unemployment insurance taxes. In principle, employees of all but the smallest THS agencies are potentially eligible to receive unemployment insurance benefits if released from work without cause.

[23] Recession dates are from the National Bureau of Economic Research, www.nber.org/cycles.html, accessed on 8/6/14.

States set both monetary and non-monetary standards for qualification of unemployed workers for unemployment insurance benefits. Monetary benefit eligibility requirements and formulae vary across states. In order for a worker to be eligible to receive unemployment insurance, the worker must have earned a threshold value of wages and/or worked a minimum number of days over a base period of time of one and one quarter years or sometimes one year. In several states, a worker must earn a multiple of the worker's weekly earnings ranging from 26 to 40. In many other states, workers must earn a certain dollar amount in the quarter with the highest earnings of their base period and a total dollar amount in the entire base period. At the high end, in Michigan, a worker in 2011 had to earn at least $2,081 in the highest quarter of earnings and at least $4,307 over the base period. At the low end, in 2011, Georgia required $400 in the highest quarter of earnings and at least $600 over the base period.

THS workers face challenges in meeting monetary criteria for unemployment insurance qualification. The intermittency of earnings of some THS workers precludes qualification for benefits. Low wages also prevent some THS workers from achieving the earnings thresholds for eligibility for unemployment insurance benefits.

States not only establish monetary criteria, they also set non-monetary policies that define initial and ongoing worker qualification for unemployment insurance benefits.[24, 25] In general, unemployment insurance recipients must have either been

[24] State non-monetary eligibility rules are detailed in the Department of Labor Employment and Training Administration "Comparison of State Unemployment Insurance Laws", located at http://www.ows.doleta.gov/unemploy/uilawcompar/2008/nonmonetary.pdf, accessed on 2/25/14.

[25] Even when states have similar non-monetary eligibility requirements, the administrative interpretation of those rules may differ substantially. Differences in application and administration of such rules are documented in "Unemployment Insurance Non-Monetary Policies and Practices: How Do They Affect Program Participation?" [Fishman et al. 2003], located at http://wdr.doleta.gov/opr/fulltext/document.cfm?docn=6189, accessed on 2/25/14.

subject to involuntary separation or have left their job for "good cause," be actively engaged in a job search, be available to work, and willing to accept an offer of a "suitable" job. Definitions of good cause for separation vary across states. Examples include illness, harassment, compulsory retirement, or joining the armed forces. Workers are disqualified from receiving unemployment insurance benefits if they voluntarily leave a job without a cause recognized by the state to be legitimate.

State laws in 27 states specify that THS workers who do not notify the THS agency of availability for future assignments upon completion of their current assignment are deemed to have voluntarily left employment without good cause and therefore are disqualified from receiving unemployment insurance even if they meet earnings and work duration thresholds. In other words, THS workers must meet a non-monetary requirement in addition to those required of traditional workers to qualify for benefits.

Employers pay taxes to fund unemployment insurance benefits according to state tax schedules, where employers who have more workers who file for unemployment insurance benefits pay higher rates than employers who have fewer workers who file for unemployment insurance benefits. The process of determining an employer's state unemployment insurance tax rate based on prior unemployment insurance claims is known as experience rating. [26] THS agencies are subject to experience rating like all other employers.

[26] States use four formulas for determining an employer's experience rating. The most common approach, the reserve ratio formula, calculates an employer's state unemployment insurance account balance divided by a three year average of annual taxable payroll. The benefit-ratio formula measures benefits paid relative to payroll. The benefit wage ratio formula is based on the payroll paid to those workers who become unemployed and receive benefits divided by total taxable wages. The payroll decline ratio formula uses the decline in an employer's payroll as a percentage of total payroll. From the Department of Labor

The unemployment insurance tax gradient refers to the difference between the highest and lowest tax rates charged to employers based on their experience rating. The mean for the statutory state unemployment insurance tax gradients across the 50 states ranged from 5.8 percentage points in 1998 to 7.8 percentage points in 2011. By state, the mean unemployment insurance tax gradient ranged from under 4.5 percentage points in Alaska and Oregon to over 9.5 percentage points in Wisconsin and Tennessee. [For mean unemployment insurance tax gradients by state, see Appendix III.] States with a larger tax gradient assign more of the unemployment insurance tax burden to employers that lay off more workers. Due to imperfect experience rating, employers and sectors that lay off fewer workers tend to subsidize employers and sectors that lay off workers extensively.[27]

THS agencies may have relatively lower experience ratings than the client employers that use them. THS agencies have an advantage over many of their client employers with respect to experience rating since fewer THS employees may qualify for unemployment insurance benefits. Some THS workers do not meet earnings thresholds since they are seasonal or low wage workers. [Mehta and Theodore 2002] Further, in more than half the states, THS workers must complete the additional step of notification or failure to call for a new assignment will render the worker ineligible for unemployment insurance. Finally, THS agencies can avoid having workers qualify for unemployment insurance benefits by offering jobs that may be inferior to the extent that workers would not want to accept them. [National Employment Law Project 2001] A

Employment and Training Administration at http://workforcesecurity.doleta.gov/unemploy/pdf/uilaws_exper_rating.pdf, last accessed 11/18/2014.

[27] Due to imperfect experience rating, employers at the highest unemployment insurance tax rate do not face rate increases as a result of additional layoffs. The proportion of employers at the highest rates, however, is very small. Moreover, employers at the highest rate can obtain lower rates in the medium term by reducing their dismissals of workers. Hence, even employers at the highest rate have an incentive to reduce employee layoffs to reduce unemployment insurance costs.

study by Vroman [1998] found that THS workers had lower unemployment insurance recipiency rates than direct hire adult workers.

Because of the advantages THS agencies have over their client employers, a traditional worker doing a given job may qualify for benefits upon layoff, thereby worsening the employers' experience rating, while a THS worker doing the same job does not qualify, so that the THS agency's experience rating does not worsen. Therefore, THS agencies may pay lower unemployment insurance rates determined by experience rating because fewer of their worker qualify. This creates an opportunity for cost savings for employers by hiring a THS worker rather than directly hiring a traditional worker. For a worker, however, it means a lower probability of receiving unemployment insurance upon separation from a THS job, which can be considered another way in which a THS job is a lower quality job than a traditional job.

Workers' Compensation. Each state defines, administers, and regulates its own workers' compensation program, which pays benefits to workers who are injured on the job.[28] Workers' compensation benefits are paid out by private insurance carriers, self-insured firms, and state and federal workers' compensation funds. The federal fund only covers federal civilian workers and a few high risk private sector jobs. The federal government has no standing body to regulate state workers' compensation agencies. A 1972 National Commission on State Workers' Compensation Laws issued a set of recommendations to state workers' compensation agencies aimed at improving adequacy of benefits and efficiency of workers' compensation insurance provision, but did not issue federal standards. [Thomason et al. 2001]

[28] The following background discussion of Worker's Compensation draws from the National Academy of Social Insurance, located at http://www.nasi.org/learn/workerscomp, accessed on 12/6/13.

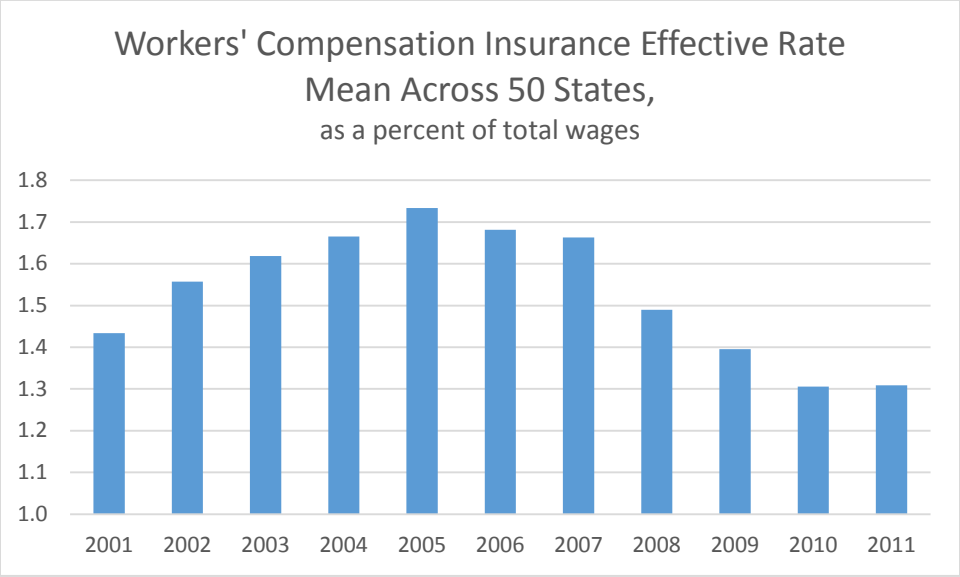
The structures of the workers' compensation insurance markets vary across states. All but four states permit private insurance carriers to provide insurance. State workers' compensation funds exist in 23 states. In Ohio, North Dakota, Washington, and Wyoming, state workers' compensation funds are exclusively allowed to insure for worker disability.

In 2011, costs to employers for workers' compensation insurance totaled an estimated $77.1 billion.[29] Workers' compensation insurance costs in 2011 ranged from under 75 cents per $100 of total wages in Massachusetts, Texas, and Virginia to over 2 dollars in Alaska, Montana, Oklahoma, and West Virginia.[30] (For mean workers' compensation costs by state from 1990 to 2011, see Appendix IV.) The mean of the effective workers' compensation insurance cost rate across the 50 states over a 2001 to 2011 period reached a high of $1.73 per $100 of total wages in 2005 to a low of $1.31 in 2010 and 2011. (See Figure 5.) Workers' compensation insurance coverage is required in all states except Texas and, as of 2012, Oklahoma. Exceptions to the requirement for workers' compensation insurance in other states include employers with very few employees or with agricultural employees.

[29] From the National Academy of Social Insurance website publication "Workers' Compensation: Benefits, Coverage, and Costs, 2011" located at http://www.nasi.org/sites/default/files/research/Workers_Comp_Report_2011.pdf

[30] From Table 11 of the National Academy of Social Insurance website publication "Workers' Compensation: Benefits, Coverage, and Costs, 2011" located at http://www.nasi.org/sites/default/files/research/Workers_Comp_Report_2011.pdf.

Figure 5



Source: Author's calculations based on data provided by NASI and A.M. Best

Employers pay the private or state workers' compensation insurance carrier a premium based on the expected risk and the amount of the deductible. Firms with more incidents that lead to workers' compensation claims are subject to higher premiums. Large companies that can demonstrate their fiscal capacity to the state regulatory agency may self-insure for workers' compensation claims.

THS agencies must obtain workers' compensation insurance like all other employers. Temporary help services agencies may be subject to a greater likelihood of workers' compensation incidents than other employers. This is in contrast to unemployment insurance, where THS agencies benefit from a lower level of unemployment insurance claims. Studies in two states found that THS workers have higher workers' compensation claim incidence rates than regular workers. [Smith et al. 2010; Park and Butler 2001] This may be because employers seek to hire THS workers

for risky jobs to avoid deterioration of their experience rating for workers' compensation insurance policies. [MacEachen et al. 2012] It may also be because THS workers are short term and, therefore, have gained less experience and training, such that they are at greater risk for injury. Workers' compensation claims have been shown to decrease as time on the job increases. [Breslin and Smith 2006]

In either case, the hiring of THS workers means that THS agencies absorb from client employers the negative effects on workers' compensation insurance risk rating for positions that are risky or for the early period on the job when the worker is more subject to injury. It is as a result of this practice that the Occupational Safety and Health Administration instituted an initiative in 2013 intended to improve work site protection for THS workers.[31] The federal agency believes that THS jobs are riskier than traditional jobs and therefore, along the dimension of worker safety, THS jobs are believed to be lower quality jobs than traditional jobs.

This introductory chapter has provided background information on the temporary help services industry, shown ways in which THS jobs can be considered lower quality jobs, and described two policy areas – unemployment insurance and worker's compensation – that may affect the concentration of THS employment in the states. If unemployment insurance or worker's compensation cause increases in THS employment concentration, they are thereby contributing to the creation of lower quality THS jobs over higher quality traditional jobs. The next chapter will undertake a theoretical analysis of the possible effects of unemployment insurance and worker's compensation on the proportion of THS employment.

[31] Per the U.S. Department of Labor Occupational Safety and Health Administration website at https://www.osha.gov/temp_workers/index.html, accessed 12/7/2013.

Chapter 2: Theory and Hypotheses

The theoretical discussion provided in this chapter explores possible causes of variation at the state level in the proportion of temporary help services employment due to the effects of policy. The first part of the discussion identifies policies that are predicted to increase the relative costs of direct hire workers compared to THS workers and then to ask whether these may lead to an increase in the share of THS employment at the state level. This section draws on neoclassical economic theory and modern labor demand theories. After considering the possible effect of policy-driven factors, the discussion then considers other factors – namely, economic growth and industrial structure – that may increase or decrease the relative levels of THS employment at the state level.

Policy Factors. When any firm faces an increase in output demand, that firm can choose from multiple labor options to increase production. In addition, in the short run, the firm can draw down inventory or increase intensity of raw materials used. In the long run, the firm can increase capital investment. Labor options to increase production include using overtime by existing employees, hiring part time employees directly, hiring full time employees directly, hiring temporary employees directly, or hiring temporary employees through a temporary help services agency.

In the international literature, the term "temporary employment" refers to a worker contract for a finite period of time, whether hired directly or through a THS agency. The focal interest of this dissertation is employment through temporary help services agencies. The implications of policies for THS workers may be different from those of direct hire workers, including temporary and part time direct hires. With direct

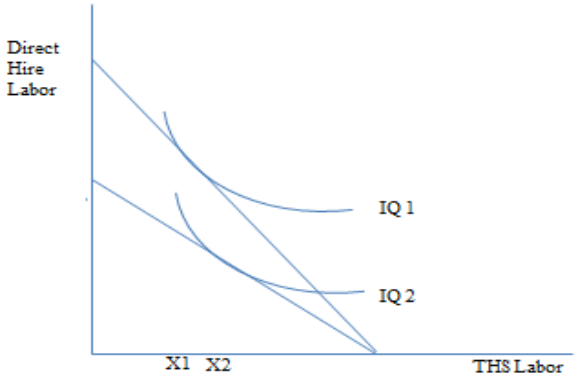
hire employees, whether full-time, part-time, or temporary, the employer is directly responsible for compliance and costs. With THS workers, the temporary help services agency is responsible for compliance with policies and regulations relevant to employment. The difference in responsibility for policy compliance implies different incentives and cost structures associated with policy factors facing employers when hiring THS workers versus direct hire workers, including even direct hire temporary workers.

According to neoclassical economic theory, firms will optimize their choice of labor alternatives to satisfy the demand for labor when output demand increases or decreases. Under conditions of optimization, the ratio of marginal cost to marginal productivity of each labor alternative will be equal. To simplify for purposes of illustration, assume that the firm has exactly two labor alternatives to increase production – temporary help services agency labor and direct hire full time employees. If THS is temporary help services labor and DH is direct hire labor, firms will choose to employ each alternative until $MC_{THS}/MP_{THS} = MC_{DH}/MP_{DH}$. Hence, if an employer with these two options faces an increase in cost only for direct hire workers without any changes in productivity, the employer will increase its use of the alternative –THS labor – until the ratios of marginal cost to marginal productivity are equilibrated. In this way, a factor that increases a firm's marginal cost of direct hire labor could lead to an increase in that firm's use of THS labor. By extension, a common factor, such as the impact of a state-wide policy, that increases the marginal cost of direct hire labor across some or all firms in a state could lead to an increase in the proportion of THS employment in that state.

Looking from another neoclassical angle, temporary help services labor and direct hire labor are substitute inputs in a firm's production function. Ceteris paribus, a decrease in employment of THS labor can lead to an increase the employment of direct hire labor as an input, and vice versa. THS labor and direct hire labor may have different levels of productivity due, for example, to potentially greater firm-specific human capital on the part of direct hire workers who may have worked for longer periods of time in a given firm than THS workers. THS labor and direct hire, therefore, can be considered imperfect substitutes. Simplifying for illustration purposes, we can divide labor into two distinct factors of production: direct hire labor and THS labor.

Given that direct hire labor and THS labor are substitutes, a change in the cost of direct hire labor implies a rotation of the isocost curve for direct hire labor and THS labor. A tax on direct hire labor, such as a payroll tax, would cause such a rotation. The profit-maximizing production isoquant shifts in response. (See Figure 5.) Depending on the marginal rate of substitution, the result is either a decrease in employment of both direct hire and THS labor or a decrease in employment of direct hire labor and an increase in employment of THS labor. (A decrease in employment of direct hire labor and an increase in employment of THS labor is depicted in Figure 5.) Basic neoclassical theory, therefore, supports the possibility that changes in taxes on direct hire labor could affect the proportion of temporary help services employment. Analogously, a change in taxes on both direct hire and THS labor that affects the costs of direct hire labor more than it affects the costs of THS labor could influence the concentration of THS employment.

Figure 6
Effect of a Payroll Tax on Direct Hire Labor



In addition to the insights provided by neoclassical theory, a body of modern labor demand literature suggests a basis for why the variation in concentration of THS employment by state might be driven by differences in state-level policies. While traditional neoclassical theory treats labor as a variable cost, empirical study of labor demand has led to the conclusion that labor costs are quasi-fixed, as proposed theoretically by Walter Oi [1962]. In other words, labor costs are a combination of fixed and variable costs. [Hamermesh 1993] Hamermesh divides fixed labor costs into two categories: recurring and one-time fixed costs. He characterizes unemployment insurance, for example, as a recurring fixed labor cost for most employees.[32] Other recurring fixed costs include disability insurance, holidays, sick leave, and some pension

[32] State unemployment insurance taxes are imposed on a maximum income earned by an employee in a year ranging from $7,000 in FL and AZ to $37,300 in 2011. For low wage employees, unemployment insurance may be considered a variable cost. For the full time employees who earn more than the maximum, unemployment insurance is an annual fixed cost. Data are from Table 2-1 of the Department of Labor Employment and Training Administration 2011 "Comparison of State Unemployment Insurance Laws," located at http://workforcesecurity.doleta.gov/unemploy/pdf/uilawcompar/2011/financing.pdf, accessed on 2/24/14.

benefits. One-time fixed costs include training, personnel costs associated with hiring, and severance pay.

By contracting with a temporary help services agency, rather than directly with potential workers, an employer can turn many fixed costs into variable costs. The employer may still directly incur some fixed costs for a THS employee in the form of training costs and personnel costs associated with contracting with the THS agency. However, when employing through a THS agency, an employer does not directly pay the worker holidays, sick leave, or pension benefits. The employer also does not pay severance costs, incurs lower personnel costs associated with hiring, and may be able to reduce training costs. Further, the employer does not directly pay unemployment insurance taxes or workers' compensation insurance. These are paid by the THS agency, and the costs are passed along in part or in total to the employer as a surcharge on the wage rate paid to the worker. Part or all of the costs may be passed on to the worker.

The question of the tax incidence of unemployment insurance taxes and mandated workers' compensation insurance for THS workers costs merits discussion. Even if states are taxing employers, the cost of the tax could be borne by employers or workers, or by other factors of production or consumers. If none of the incidence of the unemployment insurance tax falls on the THS agency – that is, the THS agency passes the entirety of the tax along to the employer – then there is less incentive for employers to hire THS workers in place of direct hire workers. If the entirety of the tax incidence is passed along to workers, moreover, there is less incentive for employers to hire THS workers. If part of the burden of the taxes is borne by the THS agency, however, then the

employer would benefit from such cost savings and would have a financial incentive to use THS employment.

Studies of empirical evidence yield findings regarding payroll tax incidence that suggest that workers bear much of the cost of payroll taxes, but differ on whether they bear all of the cost. After reviewing prior empirical studies of payroll tax incidence, in 1993, Hamermesh determined that the evidence tended to favor the assertion that the payroll tax is shifted to wages in the long run. A 1997 study by Gruber of a payroll tax cut in Chile found that the incidence of payroll taxes was fully on wages. A more recent study of payroll tax incidence in Argentina, however, found that payroll taxes were only partially shifted to wages.[33] [Cruces et al. 2010]

The empirical literature is highly limited regarding the incidence specifically of unemployment insurance taxes and workers' compensation insurance costs. Anderson and Meyer [2000] conducted a study of unemployment insurance tax incidence, based on empirical analysis of a natural experiment in which Washington State adopted experience rating in 1985. They found that firms could shift average industry tax rates to employees, but could not pass along the difference between its tax rate and the industry average. If this finding holds in other states, it implies that employers bear part of the incidence of unemployment insurance taxes and have an incentive to try to reduce that burden.

A study of the incidence of workers' compensation costs resulting from the passage of workers' compensation laws in the early twentieth century determined that employers were able to pass on a significant part of added costs to some workers in the

[33] Although in practice a tax on payroll, unemployment insurance taxes may be considered more similar to a lump sum tax than a tax on the price of labor. The empirical finding of Anderson and Mayer [2000] in the next paragraph, however, is not affected by such a recategorization.

form of lower wages. [Fishback and Kantor 1995] Gruber and Kraeger [1991] undertook a study of workers' compensation insurance that analyzed more recent data sets for five high risk industries. They found that costs of workers' compensation were largely, but not entirely, shifted to employees in the form of lower wages. If also true for other industries, employers have less strong of an incentive to try to lessen the costs of workers' compensation insurance through strategies such as hiring THS workers. That employers might seek to shift the costs of workers' compensation insurance to THS agencies, however, is theoretically plausible given they bear some of the insurance costs.

Thus, the incidence literature suggests that employers bear at least a fraction of the costs, especially of unemployment insurance taxes. As mentioned in the introduction, both unemployment insurance taxes and workers' compensation costs are applied not only to employers, but also to THS agencies. Therefore, THS workers cannot be considered an "uncovered" sector. Analysis of a covered versus uncovered sector is not relevant in this case. Harburger, in his general equilibrium model of the incidence of the corporate income tax, arrives at the conclusion that capital rather than labor bears close to all of the burden of the tax based on assuming a covered and uncovered sector. [Harburger 1962] However, analysis of whether the unemployment insurance tax or workers' compensation cost is borne by the employer or THS agency when an employer hires through a THS agency is relevant. A partial equilibrium discussion of their incidence follows.

In the market for temporary help services, in which THS agencies are suppliers, employers are buyers, and THS employment is the product, the incidence of a tax, such as the unemployment insurance tax or workers' compensation insurance on the product

would depend on supply and demand elasticities of THS employment. No empirical studies have estimated supply and demand elasticities in the temporary help services employment market. Given the number of THS agencies in the market, assuming a competitive market seems reasonable. In a competitive market, only in the case of a perfectly inelastic demand curve would the employer bear the full incidence of the tax. In all other cases, the THS agency would bear at least part of the tax burden. There is no reason to believe that the demand curve is perfectly inelastic, particularly given the substantial variation in demand for THS employment. Thus, the expected tax incidence would be shared by the supplier – the THS agency - and the buyer – the employer. Hence, the employer has an incentive to use a THS agency to share part of the incidence of unemployment insurance taxes and workers' compensation insurance costs.

Economic Growth. While theory supports the proposition that state-level differences in policy factors may explain some variation in state level temporary help services employment concentration, theory also points to differences in economic growth rates and differences in industrial structure. The primary microeconomic rationale for THS employment cited in the empirical literature is change in demand. At the aggregate level, this translates into change in economic growth. In theory, economic growth leads to an increase in demand for factors of production including labor. THS labor, in this way would be expected to increase with production growth in absolute terms.

Further, economic growth would be expected to affect not only the absolute levels of employment of THS workers, but also their relative levels of employment compared to direct hire traditional employment. In periods of economic growth, THS employment may increase more compared to traditional employment. One explanatory factor is

uncertainty. If employers are uncertain whether the increase in demand is short or long term, they may choose to resort to use of THS agency intermediated temporary workers. If the demand increase proves to be temporary, the firm can release the THS worker without the financial and non-pecuniary costs associated with directly hiring a full time employee. Further, in a small percentage of cases, a firm hires a THS employee, and then converts that employee to a direct hire if employee performance is satisfactory and the increase in demand persists. Empirical work confirms that THS employment increases relative to direct hire employment during periods of expansion. [Houseman et al. 2003]

Another reason the proportion of THS employment of total employment may increase during periods of economic growth is differences in transactions costs. Because some labor costs are fixed, according to modern labor demand theory, labor adjustments are not costless. [Hamermesh 1993] Autor [2008] argues that the fixed cost of job search for firms is the market imperfection addressed by temporary help services. Katz et al. [1999] assert that THS agencies reduce employer hiring and adjustment costs, thereby increasing the efficiency of the labor market when labor demand changes.

If labor adjustment is less costly when employing THS workers, then relative increases in use of THS workers during periods of increased labor demand would be expected. Conversely, if labor adjustment is less costly in dismissing THS workers, then relative decreases in the use of THS workers would be expected during periods of decreased labor demand. In other words, greater volatility in temporary help services employment would be predicted by theory. This prediction is borne out in the literature. [Wenger and Kalleberg 2006, Estevao and Lach 2001, Heinrich and Houseman 2013]

Neoclassical theory does not take into consideration information failures and transactions costs. In the case of the employment transaction, these are considerable. Any employer, including THS agencies, faces information asymmetries vis-à-vis potential employees. That is, the employer does not know the true capabilities of a job applicant as well as the applicant. Employers, including THS agencies, incur costs, such as time expended for interviews and reference checks, to obtain better information about the applicant. Even so, due to incomplete information, direct hire employers and THS agencies undertake risks in hiring that the applicant's capability and productivity may be lower than believed at hiring, which would imply a cost in terms of lost productivity. According to Katz et al. [1999], THS agencies facilitate better job matches through screening. That is, while THS agencies also face information costs, they lower their costs relative to direct hire employers through more effective screening. Neugart and Storrie [2006] support this assertion and posit that it is improvements in the matching efficiency of agencies that have led to the growth of THS work across the OECD.

During periods of economic growth, when firms face the need to hire workers to expand production, the lower transactions and information costs associated with hiring temporary help services workers may lead to an increase in the concentration of THS workers. If such periods of economic growth occur unevenly among states, as they often do, this could help to explain the differences among state levels of THS employment. State economic growth, therefore, is included in the empirical analysis of both THS employment levels and relative THS employment levels expressed as the concentration of THS employment.

Industrial Structure. Along with policy factors and economic growth, another factor that, in theory, may affect the proportion of THS workers hired in a state is industrial structure. Firms in some industries may tend to have a higher demand level for THS workers due to differences in production technology across industries. Variations in production technology are treated as exogenous in neoclassical theory. When looking at an economic aggregate such as the state, however, variations in production technology are commonplace. When considering state economies over time, moreover, production technology shifts within industries are likely.

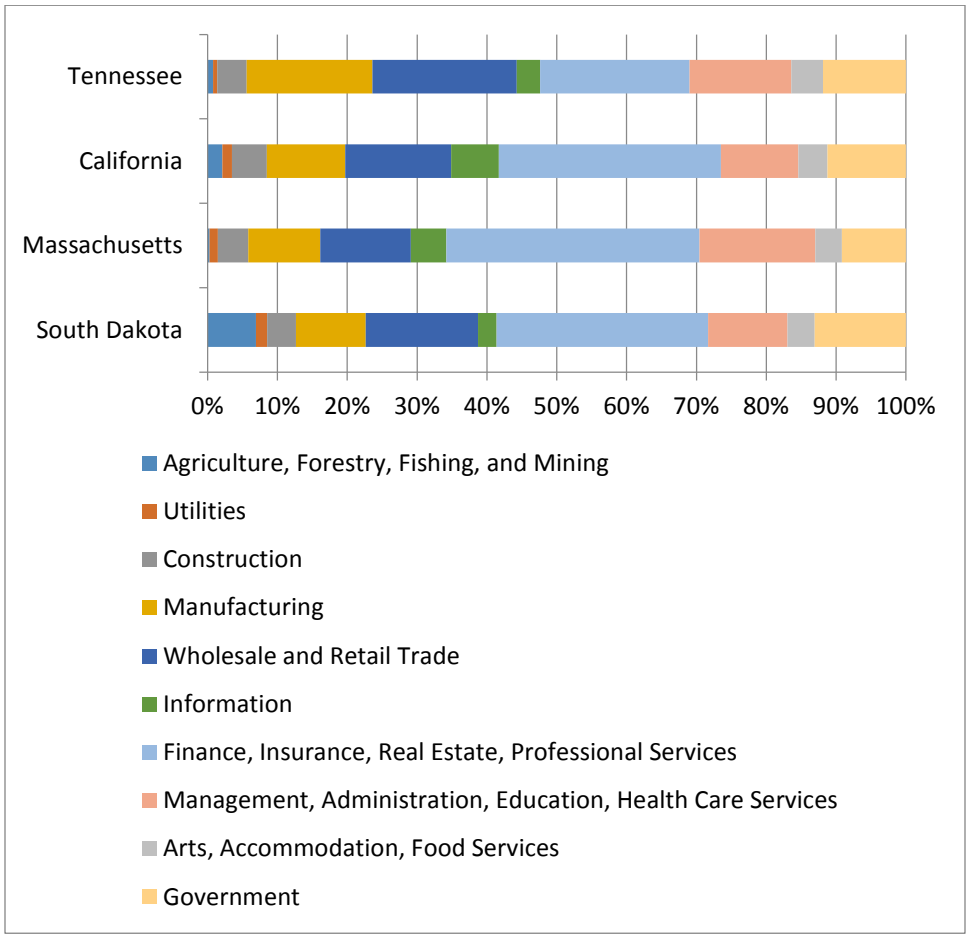
Empirical work has shown that firms are more likely to employ THS workers for tasks that require little firm-specific human capital. [Masters and Miles 2002; Autor 2003] Therefore, industries whose production technologies are such that firms have a higher proportion of jobs that do not require special training or experience may be more likely to hire more THS workers. Conversely, in industries with more jobs that require firm-specific training, employers may be less likely to hire THS employees. Changes in production technology in an industry can also lead to changes in relative THS employee demand. Empirical evidence shows a secular increase in dependence on THS workers in manufacturing, as well as in trade, transportation and utilities. [Luo et al. 2010] While these secular increases are hard to explain, it is possible that changes in production technology in these industries contributed to the increase in THS employment.[34]

States have different industrial compositions. Figure 6 shows the industrial compositions of the four states depicted in Figure 2 in the introductory chapter. In states with higher concentrations of industries that tend to employ THS workers as a result of

[34] The reasons for the secular increase in THS employment in these industries were not addressed in the article.

their production technologies, we can expect to observe a higher proportion of THS workers. Hence, industrial structure is considered in the empirical analysis.

Figure 7
Industrial Compositions of 4 States



Source: Bureau of Economic Analysis[35]

Neoclassical theory suggests that policy factors that increase the relative costs of direct hire workers to THS workers could lead to an increase in the level and proportion of THS workers in a state economy. Modern labor demand theory provides a theoretical

[35] Bureau of Economic Analysis Regional Data: Gross Domestic Product by State, located at http://www.bea.gov/regional/index.htm , accessed on 12/17/2013.

basis for the postulate that policy factors that increase fixed costs of employment could create an incentive to use THS workers. Factors considered exogenous to neoclassical models – transactions costs and production technology – may also effect changes in the level and concentration of THS workers in a given state in a given year through variation in economic growth and industrial structure. Differences in economic growth rates across states would be predicted to generate different relative growth rates of THS employment. States with industrial structures that are more concentrated in industries with greater demand for THS workers can be expected to have higher employment of THS workers relative to all workers. As a result, all three classes of factors are included in the model tested empirically.

Hypotheses

With regard to policy factors, the following three hypotheses will be tested:

(1) Higher average unemployment tax rates lead to a higher proportion of temporary help services workers.

According to theory, a factor that increases fixed costs can create an incentive to use THS labor in place of direct hire labor. Unemployment insurance taxes increase the fixed costs of labor. Unemployment insurance tax rates, moreover, vary across states. Higher unemployment insurance tax rates can be expected to create a greater incentive to hire THS workers in place of direct hire workers.

Further, theory and empirical evidence suggest that the incidence of unemployment insurance taxes, when a worker is hired through a THS agency, is shared by the employer and the THS agency. In other words, an employer can obtain some cost savings on

unemployment insurance taxes by using a THS agency. Where state unemployment insurance taxes are higher, employers have greater incentive to reduce or avoid the taxes by hiring workers through THS agencies.

(2) *Greater unemployment insurance tax gradients lead to a higher proportion of temporary help services workers.*

The unemployment insurance tax gradient refers to the differential between the maximum and minimum unemployment insurance tax rates. As discussed in the introductory chapter, employers' unemployment insurance tax rates are determined, in part, by their experience rating. Employers with more workers who have applied for and received unemployment insurance benefits pay higher rates that those with fewer workers who have done so. If an employer terminates an employment contract with a worker without cause, the firm's experience rating can suffer. As a result, the unemployment insurance rate on all workers for the firm the subsequent year would be higher. This could constitute a notable additional cost of firing a worker. To avoid a negative impact on experience rating from hiring a regular worker, an employer can hire a THS worker. An employer with an unfavorable experience rating, similarly, can improve that rating by avoiding or reducing further unemployment claims through the hiring of THS workers.

Temporary help services agencies are liable for paying unemployment insurance taxes, like other employers. THS agencies, however, may have advantages in protecting their experience rating, as discussed in the introductory chapter. THS workers have the lowest unemployment insurance benefit recipiency rates relative to other adult workers. [Vroman 1998] The expected marginal cost of unemployment insurance for a THS employee to a temporary help services agency may be lower than the expected marginal

cost of unemployment insurance for a direct hire employee to an employer. Even if not the case, the benefit to an employer of reduced risk of a deterioration of its experience rating that would lead to an increase in its unemployment insurance tax rate applied in subsequent years to all employees has value. That value would be greater where the cost of deterioration in experience rating is higher. In states where employers face a steep increase in their unemployment insurance tax gradient due to deterioration in experience rating, they have a greater incentive to avoid additional unemployment insurance claims. In other words, in states where the percentage increase in unemployment insurance taxes is greater from the minimum to the maximum rate, firms would be more likely to seek to avoid deterioration of experience rating for unemployment insurance taxes by employing THS workers.

(3) Higher workers' compensation insurance costs lead to a higher proportion of temporary help services workers.

Factors, such as workers' compensation insurance costs, that increase fixed costs of hiring direct hire labor can, in theory, create an incentive to use THS labor in place of traditional labor. Higher workers' compensation insurance costs can be expected to create a greater incentive to hire THS workers in place of direct hire workers. Theory suggests that the employer and the THS agency would share the costs of workers' compensation insurance for a THS worker. According to empirical evidence, the incidence of unemployment insurance taxes falls mainly on the employer, but may be borne to a limited degree by the THS agency. In other words, an employer may be able to secure some workers' compensation insurance cost savings on by using a THS agency. Thus,

where state workers' compensation insurance are higher, employers may have greater incentive to reduce those costs by hiring workers through THS agencies.

Chapter 3: Literature Review

The temporary help services sector has attracted research attention due to its rapid growth during the last quarter of the 20th century, and to its significance for workers, employers, and the macroeconomy. Workers in THS jobs face greater uncertainty and, as discussed in the introduction, lower job quality than they would in traditional jobs. Employers have a ready means to meet labor needs on a temporary basis through the THS sector. THS employment appears to facilitate macroeconomic transitions after times of recession by helping reduce the wage rigidity that can impede recovery. [Heinrich and Houseman 2013]

The U.S. literature has centered on the three main questions that follow. First, how does THS employment relate to macroeconomic growth and macroeconomic factors? Second, under what conditions do employers use THS workers in place of traditional workers? Finally, what is the effect on workers of holding a THS job? The international literature has contributed to the discussion of the effect of holding a temporary job on workers. Further, the international literature provides insight into the relationship between employment protections and temporary employment. The following discussion describes the literature addressing these three questions, as well as the international literature.

THS Employment and the Macroeconomy. The literature regarding THS employment and the macroeconomy considers the relationships between THS employment growth and macroeconomic growth. Although a small number of articles have followed this line of inquiry, conclusions drawn have been consistent. Temporary help services job growth is widely considered a leading indicator of employment growth

and a coincident indicator of macroeconomic growth. [Heinrich and Houseman 2013; Berchem 2012; Kilcoyne 2005] THS worker usage was found to be correlated positively with output growth from the current to the next year during the 1980s and 1990s in the United States. [Segal and Sullivan 1997] Analysis of data from the Netherlands also found that temporary employment work increases prior to GDP growth. [de Graaf-Zijl and Berkhout 1997] Heinrich and Houseman [2013] assert that THS employment is not merely responsive to macroeconomic conditions, but that it performs an important role in facilitating economic transitions during times of recession and recovery.

THS employment, moreover, is subject to a high degree of volatility in response to macroeconomic trends. Volatility of temporary help services employment has been found to be significantly greater than for full-time, regular employment. [Wenger and Kalleberg 2006] THS worker employment in manufacturing was dramatically more volatile than regular employment through the late 1990s, according to Estevao and Lach [2001]. The pattern of volatility continued through the recessions of the 2000s. [Heinrich and Houseman 2013] Holmlund and Storrie [2002] similarly found increased volatility in temporary work over open-ended employment in Sweden through the 1990s.

Empirical research has found that growth patterns of THS employment co-vary with demand factors, but not significantly with supply factors such as changes in workforce composition or worker preferences. [Golden 1996; Wenger and Kalleberg 2006] Growth in temporary help services employment in the 1980s was found the be positively associated with labor demand factors including fluctuation in industrial output, intensified foreign competition, the relative magnitude of non-wage labor costs, and the diminished bargaining power of labor. [Golden 1996; Laird and Williams 1996;

Kalleberg 2011] Analysis of data through 2000 supported this "demand side" explanation of growth patterns of temporary help services employment. [Wenger and Kalleberg 2006]

Employer Demand for THS Employment. A substantial literature considers the demand side factors contributing to THS employment. This vein of literature relies heavily on employer surveys as sources of data. Principal reasons for employers to use temporary help services employment are to respond to increases in demand, reduce hiring costs, and cut firing costs. The most commonly cited rationale for employers to hire THS employees is to meet fluctuating output demand levels. [Mangum et al. 1985; Golden 1996; Laird and Williams 1996; Wenger and Kalleberg 2006; Andersson et al. 2008; Vidal and Tigges 2009] The ongoing option to use THS employees means that employers do not need to maintain costly overstaffing during periods of normal to low demand. [Mangum et al. 1985]

Hiring through temporary help services agencies, moreover, has been shown to allow employers to reduce fixed costs associated with hiring [Autor 2008; Autor 2001] and to improve matching efficiency. [Neugart and Storrie 2006] The fixed costs diminished by using THS employees, although not eliminated, include financing a human resource apparatus and investment in worker hiring and training. Another cost reduced by using THS employees is the length of time elapsed with an unfilled, and thereby unproductive, position until a job match is reached. [Houseman et al. 2003]

Employers also hire through THS agencies to avoid costs associated with termination of an ongoing direct hire employment relationship. Employers seek to reduce real costs such as unemployment benefits, severance, and other entitlements. They also aim to diminish social costs such as loss of trust, morale, and productivity of remaining

workers. [Foote and Folta 2002] Further, employing firms hire THS employees to avoid potential legal liabilities from accusations of wrongful termination. [Autor 2003]

Employers have been shown to use temporary help services workers for several reasons in addition to an increase in demand and reduction of hiring and termination costs. Use of THS workers allows employers to obtain a means of wage discrimination [Houseman et al. 2003] and benefit discrimination where non-wage labor costs are high. [Mangum et al. 1985; Davis-Blake and Uzzi 1993; Golden 1996; Laird and Williams 1996; Houseman 1997] In an empirical analysis of national data from 1982 to 1988, an indicator of nonwage costs per employee was found to be positively correlated with THS employment of the total labor force. [Golden and Appelbaum 1992] Based on survey data analysis, Houseman [1997] showed that firms with costly benefits used more THS workers. More recent qualitative work has revealed that a key motivation for firms to use THS workers rather than "traditional" workers is to avoid paying benefits such as healthcare and pension benefits. [Mitlacher 2007 and Lautsch 2003]

In some cases, employers may seek to obtain highly specialized skills from THS agencies. [Abraham and Taylor 1996; Masters and Miles 2002] In other cases, employers may seek to identify good candidates for permanent jobs by hiring through a THS agency [Vidal and Tigges 2009]. However, a study of administrative data from a large temporary help services agency found that less than 7% of temporary contracts become permanent. [Heinrich and Houseman 2013]

Employers whose workers require more firm-specific skills, measured as training expenditures per worker, are less likely to hire THS workers. [Capelli and Keller 2013] Employers do not use THS agencies to hire "core" workers whose positions require firm-

specific knowledge or skills that contribute to a firm's competitive advantage. [Masters and Miles 2002; Autor 2003] Employing firms are more willing to incur the hiring, benefit, and potential termination costs involved in directly hiring such employees. It is when they face increases in demand and seek to reduce hiring, termination, and benefit costs that employers turn to THS agencies.

The management and human resource literature includes both descriptive and prescriptive work concerning the microeconomic decision whether to hire a new employee using internal resources or hire a new employee via a temporary help services agency. The decision is characterized as a "make or buy" decision, consistent with a common approach in business case studies and literature to the study of internal production versus outsourcing. Hiring directly would be considered a decision to "make" the employment contract internally while hiring through a THS agency would be considered a decision to "buy" the employment contract through an outsourcing arrangement.

Early discussion of the topic asserted that employers large enough to maintain an internal human resources structure will decide whether to use internal resources (e.g., "make) or contract with an external enterprise such as a THS agency (e.g., "buy") based on which minimizes transactions costs. [Mangum et al. 1985] An investigation of the transactions cost perspective undertaken by Masters and Miles [2002] found a positive association between uncertainty whether the job hire would be repeated in the future and use of external labor arrangements such as THS employment. When uncertain whether repeat hiring will take place, firms choose not to invest in human resource capacity that will not be used again with some frequency over time. Prescriptively, Foote and Folta

[2002] recommend that firms treat the decision whether to hire a temporary or regular worker based on a real options model, taking into account not only the costs associated with hiring but also the potential for future layoffs. Andersson et al. [2008] assert that, firms that invest intensively in research and development are more productive if they maintain many channels to bring in workers, including internal labor market approaches and spot market – e.g., THS market – approaches. Other human resources literature advises employers on how to better integrate and improve productivity of temporary workers. [For example, Feldman et al. 1994; von Hippel et al. 1997; Foote 2004]

The Effect of THS Employment on Workers. Central to the discussion of whether THS jobs are "stepping stones" or "bad jobs," addressed in the introduction, is the literature on the effects of holding a THS job on low income THS workers. International literature has similarly reported research on the effects of temporary jobs on workers. Most of the empirical work has sought to ascertain the short- and long-term impact on earnings of holding a THS job. In summary, the U.S. literature suggests that temporary help services jobs lead to better outcomes than unemployment, yield slightly worse outcomes for low-wage workers than regular direct hire jobs, and can serve as a stepping stone for those select low wage workers who obtain regular direct hire jobs after holding the THS job.

Autor and Houseman [2007], based on random assignment Temporary Assistance for Needy Families data from Detroit, find that THS job spells increase the earnings of workers receiving TANF, but only in the short term. Heinrich et al. [2005] examined the effects of THS work spells using administrative data on all welfare recipients in Missouri and North Carolina and found that welfare recipients who go to work for temporary help

service firms have lower initial wages but faster subsequent wage growth than workers who secure direct hire jobs. Two years later, compared to workers who initially had direct hire jobs, THS workers' wages are slightly lower, unemployment rates are similar, and public assistance recidivism is slightly higher.

Lane et al. [2003], based on analysis of data from the Census Bureau's Survey of Income and Program Participation using propensity matching score methods, find that after one year, workers have worse outcomes in terms of wages and employment duration than traditional workers. On the other hand, spells of THS employment improve the labor market outcomes of workers relative to spells of unemployment. The study concludes that outcomes for THS workers are closer to those of traditional workers than those who remain unemployed.

Andersson et al. [2007], based on Longitudinal Employer Household Dynamics (LEHD) data from the Census Bureau for five states, find that THS employment serves as a stepping stone for some low-wage earners. Temporary help services workers have lower earnings while employed through the THS agency. For those few who succeed in securing stable employment after their temporary help services employment episode, their earnings are higher.

Analysis of survey data from Milwaukee and Silicon Valley suggests that workers who hold temporary employment services jobs obtain higher earnings in subsequent jobs. [Benner et al. 2007] The study represents a departure from the study of low wage earners. THS workers in computer programming, moreover, were found to earn higher wages than the average traditional worker, whereas THS workers in all other occupations except nursing earned lower wages. [Kilcoyne 2005] The findings of the Benner et al [2007]

study, which would have included computer programmers from Silicon Valley, therefore, may therefore be atypical.

The debate over whether temporary employment serves as a stepping stone or "bad job" has been ongoing across OECD countries, as well as the United States. In most of the international literature, "temporary employment" refers broadly to any temporary or fixed term job, whether brokered by a THS agency or directly contracted by the employer. Temporary employment is contrasted with regular, open-ended contracts. A survey of the international literature is inconclusive as whether temporary jobs serve as "stepping stones" to better opportunities.

In Great Britain, Booth et al. [2002], based on data from the British Household Panel Survey, find that temporary work jobs may be "bad jobs," but that fixed-term contracts are a stepping stone to permanent work for women. Amuedo-Dorantes [2000] found no evidence that temporary work served as a stepping stone for labor in Spain. By contrast, in Italy, according to Picchio's analysis of multiple waves of the Survey of Italian Households' Income and Wealth [2008], holding a temporary job raised the probability of having a permanent job two years later by about 13.5–16 percent. De Graaf-Zijl et al. [2011] conclude that, in the Netherlands, acceptance of a temporary job shortens unemployment duration and that regular jobs found via temporary jobs pay higher wages than regular jobs found directly from unemployment. In Japan, Esteban-Pretel et al. [2011] report that temporary jobs serve as neither stepping stones nor dead ends, but do have a lasting effect on the occupational trajectory and financial welfare of the worker.

Employment Protections and Temporary Employment. A field of the international literature relevant to the dissertation concerns the effect of employment protections on temporary employment. The international literature consistently suggests that the level of government employee protections has a significant effect on the level of temporary employment. Theodore and Peck [2002] assert that temporary employment tends to be positively related to labor regulation rigidity at the national level. Kahn [2007] analyzed data from a sample of OECD countries with differing levels of mandated employment protection that included Finland, Italy, the Netherlands, Switzerland, the United Kingdom, and the United States. He found that countries with higher employment protections are associated with a higher incidence of temporary employment, especially for young workers and women.

Temporary employment legislation has had significant effects on temporary employment levels in European countries. The 1997 Treu Act in Italy, which eased the regulation of temporary work, led to the growth of temporary employment. [Destafanis and Fonseca 2007] UK legislation in 2002 giving temporary workers greater protection reduced demand for temporary workers. [Biggs 2006] These articles on the effect of employment protections on temporary employment show that changes in policies that directly reduce the costs of temporary workers increase use of temporary workers, as do policies that increase the costs of hiring and firing workers.

Autor [2003] examined the effects of increased employment protections on U.S. THS employment levels across states up to 1992 by conducting research on judicial exceptions to the employment at will doctrine. Employment at will refers to the right of employers to dismiss workers without the requirement of proving cause. Exceptions to

employment at will imply an increase in employment protections. The study found that state courts' adoption of exceptions to the employment at will doctrine indeed was correlated with an increase in THS employment levels that subsided after four years.

Relevance of the Literature on THS Employment. The literature evaluates factors associated with and causal to a range of outcome variables pertaining to the temporary help services sector. The literature on THS employment and the macroeconomy analyzes changes in the quantity of THS employment over time as a means to draw conclusions about the relationship between THS employment and macroeconomic output growth. These studies utilize the absolute level of THS employment, rather than the proportion of THS employment, as the outcome variable of interest. They highlight, however, the high level of variation in THS employment levels that accounts for the high level of variation in the proportion of THS employment and the importance of economic growth as a factor explaining such variation.

The macroeconomic studies are longitudinal within a country, rather than comparative. The studies that compare employment across countries evaluate the incidence or proportion of temporary employment as the outcome variable of interest. [Booth et al 2002, Kahn 2007] In order to scale for differences in the size of the labor markets across countries, the comparative research analyzes temporary employment as a fraction of all employment. Because the dissertation analyzed differences across U.S. states, the dissertation adopted the approach used in prior comparative research of using the proportion of THS employment as the outcome variable, although drawing on all of the extant research on the THS sector.

The microeconomic studies of demand factors explaining the use of THS workers in place of traditional workers tend to use firm or establishment use of THS workers as an outcome indicator variable, although number of THS workers employed by the firm or establishment is also used. These articles provided guidance as to possible drivers of demand for THS workers that influence the proportion of THS employment. The literature on the effects of THS employment on low wage workers helped inform the discussion of THS job quality and the policy implications of dissertation findings. The studies of the effects of THS employment on low wage workers use indicators of welfare, such as earning, employment, or welfare recidivism as the dependent variables in their analyses.

Limitations of the Literature on THS Employment. While robust scholarship on THS employment has been published, the literature as a whole has limitations. Due to data limitations, neither aggregate nor longitudinal data series on employment and wages are broken down by occupation, so that direct comparison of earnings and other welfare outcomes of workers in the same occupation cannot be made. This inhibits the rigor of conclusions regarding the effects of THS jobs compared to traditional jobs on workers. Most of the quantitative studies of the welfare effects of THS work on workers, moreover, pertain to low wage and unemployed workers. It is not made clear what proportion of all THS workers this group represents. The effect more generally of THS work on workers is not addressed. The applicability of findings regarding low wage workers as to whether THS jobs are “bad jobs” or “stepping stones” to other workers not included in the low wage category is uncertain.

The early literature on factors driving demand for THS workers may have limited applicability to later periods. The THS industry was rapidly evolving over the course of the time period studied by the early literature on demand side drivers. These drivers may be different in the context of a mature THS industry. Further, the literature is dominated by the study of demand side factors, with little research attention given to supply side factors. Understanding of the drivers and rationales for THS employment for workers, therefore, is limited.

Although the U.S. literature on temporary help services employment considers microeconomic drivers and macroeconomic patterns of THS employment, of noteworthy absence is study of the effects of government policies on THS employment, with the exception of Autor's [2003] study of employment at will jurisprudence during the early stage of THS employment growth. The international literature includes research on the effects of policies on the demand for temporary employment. The U.S. literature, by contrast, has not yet addressed government policies vis-à-vis THS employment. The leaves room for the present original research on the effects of state policy factors on THS employment in the United States.

Chapter 4: Methodology and Data

This chapter will first present the methodological approach to the study of the effects of policy on THS employment concentration. Next, the models are described, and their advantages and limitations discussed. Each variable is defined and its data source identified. Alternate models and specifications, as well as the study time period are discussed. Finally, data descriptive statistics are summarized.

Methodological Approach. Prior research into the drivers of temporary help services employment has relied on both quantitative and qualitative methods. The quantitative research has analyzed original surveys of client firms or establishments to ascertain microeconomic drivers associated with THS employment in a firm or establishment. [For example, Houseman et al. 2003 and Foote and Folta 2002.] Qualitative research has investigated motivations for firms to use THS workers in place of traditional workers [Lautsch 2003 and Mitlacher 2007] and factors linked to the decision to contract through a THS agency rather than through internal resources. [Mangum et al. 1985 and Masters and Miles 2002] International scholarship has undertaken regression analysis of national data from OECD countries to establish an association between levels of employment protection and the proportion of temporary employment. [Booth et al. 2002 and Kahn 2007]

The U.S. literature has not addressed the question of whether policy factors can cause employers to substitute temporary help services jobs for traditional jobs. Theoretical analysis indicates that policy factors can lead employers to substitute THS employment for traditional direct hire employment. The dissertation hypothesizes that higher unemployment insurance tax rates, higher unemployment insurance tax gradients,

and higher workers' compensation insurance costs each lead to a greater proportion of THS workers in the workforce.

The design for the dissertation research was quasi-experimental, combining cross-sectional and longitudinal data. [Campbell and Stanley 1963] The analysis drew on disparities in the variables of interest across the states, as well as within states over time. By taking advantage of non-experimental variation in policy factors across states, causality can be considered as long as the variation in the policy factors under study is exogenous. [Riegg 2008] The three policy factors studied - unemployment insurance tax rates, unemployment insurance tax gradients, and workers' compensation insurance costs - can arguably be considered exogenous, as discussed in the section below on variables.

As a first step in seeking to establish a causal relationship between unemployment insurance tax rates, unemployment insurance tax gradients, and workers' compensation insurance costs and THS employment concentration, a robust set of controls for observables derived from theory and prior empirical work was included in the regression analysis. [Wooldridge 2010] To further control for unobserved factors that may be correlated with both the dependent variable THS employment concentration and the independent policy factors, regression analysis with state and year fixed effects was carried out. State fixed effects remove the effects of unobserved time constant variables that vary across states. Year fixed effects remove the effects of unobserved idiosyncratic national changes in a given year. This study is identified off of differences over time in policy variables within states.

The state fixed effects replace the value for each variable for unit i (states) at time t with the difference between the mean for each state i and the value for each state i at

time t. [Wooldridge 2012] Angrist and Krueger [1999], in the Handbook of Labor Economics' chapter on Empirical Strategies in Labor Economics, present the fixed effects model as an established strategy for seeking to establish causality using panel data. The fixed effects approach is akin to a differences-in-differences strategy.

Panel data were used to allow analysis of the variation in THS employment concentration across the 50 states and over time. Use of panel data offers advantages and limitations, described by Hsiao [2003]. Panel data provide multiple observations of the unit of study – in this case, states. A panel data set offers a larger number of observations for each unit of analysis than a cross sectional data set of the same units, thereby increasing degrees of freedom and improving the efficiency of the analysis. Further, the use of panel data allows for the use of fixed effects that provide greater controls for omitted and unobserved variables than either cross section or time series data since panel data include information on both intertemporal dynamics and individual units. A limitation of the use of panel data is that it does not allow for heterogeneity of effects of variables across units. The inclusion of fixed effect variables for individual units addresses this limitation by allowing intercepts to vary for each unit.

Another approach to evaluating panel data is the random effects model. In the random effects model, the unobserved variables are assumed to be uncorrelated with the observed independent variables. By contrast, the fixed effects model allows correlation between unobserved variables and the independent variables. An advantage of the random effects model is that it allows for estimation of the effects of variables that are time invariant or have little change over time. A disadvantage is that, unlike fixed effects

models, random effects models do not control for omitted variables, so that omission of variables can lead to omitted variable bias.

To ensure that the unobserved variables were not independent of the independent variables, such that the fixed effects approach was appropriate, a Hausman test was executed. [Hausman 1978] The Hausman test entails applying both random effects and fixed effects and then testing for statistically significant differences in the coefficients of the independent variables. The Hausman test yielded a chi-squared value of 584 with a probability of .0000 that the null hypothesis holds. Hence, the test rejected the assumption that the unobserved variables were uncorrelated with the independent variables, affirming the suitability of a fixed effects model for the analysis undertaken.

The fixed effects model suffers from two practical limitations. First, it does not account for variation across units i (states). The fixed effects transformation is sometimes called the "within transformation" since it uses time variation in the dependent and independent variables within each cross-sectional observation. [Wooldridge 2012] That is, the state fixed effects model does not estimate effects across states, but rather estimates effects within states. Second, the fixed effects estimator removes any time-constant variables along with the unobserved effect. The effects of any time constant variables, therefore, cannot be evaluated. Where a variable has little variation within i over time t, but substantial variation across units i, moreover, fixed effects may not be an effective measurement approach. The limitations imply that fixed effects are not well suited for gaining understanding of differences across states or of variables with little variation over time. Hence, models without fixed effects were included in the analysis.

Models. The OLS model estimated without fixed effects follows. Where i is state, t is time/quarter, THS is the temporary help services employment concentration variable, UIR is the state unemployment insurance tax rate variable, UIG is the state unemployment insurance tax gradient, WC is the workers' compensation cost variable, X is a vector of control variables, and u_{it} is an error term:

(1) $$THS_{it} = \beta_0 + \beta_1 UIR_{it} + \beta_2 UIG_{it} + \beta_3 WC_{it} + \beta_4 X_{it} + u_{it}$$

Because temporary help services employment is a function of both supply and demand, the variable THS_{it} is part of a simultaneous equation system. However, we can observe only the outcome of the intersection of supply and demand. The dependent variable for the dissertation was this observable THS_{it}. In this way, the regression analysis used a reduced form equation that expressed an endogenous variable in terms of all exogenous variables and unobserved errors in the simultaneous system. An advantage of the reduced form equation is that it does not have inherent simultaneity and therefore can be estimated using ordinary least squares. [Wooldridge 2012]

The model with fixed effects follows. Where i is state, t is time/quarter, THS is the temporary help services employment concentration variable, UIR is the state unemployment insurance tax rate variable, UIG is the state unemployment insurance tax gradient, WC is workers' compensation costs, α_i is a vector of state indicator variables, λ_t is a vector of year indicator variables, X is a vector of control variables, and u is an error term:

(2) $$THS_{it} = \beta_0 + \beta_1 UIR_{it} + \beta_2 UIG_{it} + \beta_3 WC_{it} + \beta_4 X_{it} + \alpha_i + \lambda_t + u_{it}$$

Variables of Interest and Data Sources. A description of the variables in the above equations and the sources of data for each variable follows.

The dependent variable THS_{it} is the proportion the temporary help services employment constitutes of total employment in the state, also referred to as the concentration of THS employment in the state. Total employment refers to all unemployment insurance-covered jobs, which exclude members of the military stationed in the U.S. and self-employed farmers and agricultural workers.[36] Due to variation in the sizes of the state economies and employment levels, the quantity of THS jobs cannot be used as the dependent variable in the regression analysis without being scaled. The means of scaling selected for the analysis was to divide THS employment by total employment, thereby calculating the proportion of THS employment as a dependent variable. Prior comparative studies established comparability across nations by using the incidence or proportion of temporary employment as the dependent variable. The same method was employed here for comparability across states.

An advantage of the proportion measure is that it effectively represents the construct under study, set out in the theory chapter. The question considered is when employers substitute THS employment for traditional direct hire employment. In other words, with a given demand for labor, when would a higher proportion of that demand be satisfied using THS labor? The measure also corresponds to employment decision-making practices of employers. Typically, an employer will decide if additional labor is

[36] Also excluded are those small farm agricultural employees, domestic workers, and unpaid workers who are not subject to unemployment insurance reporting. Over 98% of all jobs are covered. From the Bureau of Labor Statistics' Handbook of Methods, located at http://www.bls.gov/opub/hom/homch5_itc.htm, accessed last on 9/13/2014.

needed and then decide which type of labor to hire. This is best addressed by a proportion model. Changes in THS concentration are an indicator of changes in the relative benefits of THS employment versus traditional employment in the employers' hiring algorithm. An alternate approach of using the quantity of THS jobs as the dependent variable, while including total employment as a right hand side control variable is discussed in the section below on alternative models.

The data for both temporary help services employment and total employment were drawn from flat files published by the Bureau of Labor Statistics from its Quarterly Census of Employment and Wages (QCEW). The data were not seasonally adjusted. The BLS gathers the data for the QCEW from employers via "ES-202" submissions of employment information for all employees covered by state unemployment insurance programs or the unemployment insurance for federal employees program. The QCEW thus provides a "virtual census" of nonagricultural employees and covers over 98% of all employees.[37] The data regarding THS employment are derived from "ES-202" reports by THS agencies of their employees on a given day. The scope of data collection means the data approximate the population of THS workers.

The state unemployment insurance tax variable UIR_{it} is the average effective unemployment insurance tax rate by state. The rate was calculated as the ratio of total contributions for unemployment insurance in the state to total wages for all unemployment insurance-covered workers in the state. Data were provided by staff economists of the Department of Labor Employment and Training Administration (DOLETA). The use of total wages in the denominator was to ensure comparability

[37] From the Bureau of Labor Statistics' Handbook of Methods, located at http://www.bls.gov/opub/hom/homch5_itc.htm, accessed last on 9/13/2014.

across states.[38] The average effective unemployment insurance tax rate utilized is a measure of the cost of state unemployment insurance to employers in the states.

The state unemployment insurance tax gradient UIG_{it} is measured as the difference between the state's highest statutory unemployment insurance tax rate and the state's lowest statutory unemployment insurance tax rate in any given year. An employer's experience rating determines the unemployment insurance tax rate the employer must pay. Employers that have dismissed a higher number of workers and therefore have a greater experience rating pay higher tax rates than employers that have dismissed fewer workers and therefore have a lower experience rating.[39] The state unemployment insurance tax gradient is an indicator of the unemployment insurance tax rate penalty in each state for dismissing additional employees who qualify for unemployment insurance.[40]

Data on the minimum and maximum state unemployment insurance statutory tax rates for 1990 to 2001 were provided by staff economists of the Department of Labor Employment and Training Administration (DOLETA). Data from the same series for 2002 to 2011 were extracted from the *Significant Provisions of State Unemployment*

[38] An alternative measure that uses the taxable wages of covered workers in the denominator was rejected since it would not be comparable across states because the taxable wage base varies by state.
[39] States employ one of four formulas for determining an employer's experience rating. The most common approach, the reserve ratio formula, calculates an employer's state unemployment insurance account balance divided by a three-year average annual taxable payroll. The benefit-ratio formula measures benefits paid relative to payroll. The benefit wage ratio formula is based on the payroll paid to those workers who become unemployed and receive benefits divided by total taxable wages. The payroll decline ratio formula uses the decline in an employer's payroll as a percentage of total payroll. From the Department of Labor Employment and Training Administration at http://workforcesecurity.doleta.gov/unemploy/pdf/uilaws_exper_rating.pdf, last accessed 11/18/2014.
[40] The tax gradient does not, however, take into account the percentage of employers at each level within the tax gradient. Such data were not available in a form to permit calculation of weighted tax gradients comparable across states.

Insurance Laws tables from 2002 to 2011 web-published by DOLETA.[41] The data were collected by DOLETA from state unemployment insurance agencies.

The workers' compensation cost variable WC_{it} is an indicator of the average effective rate that employers pay in each state for workers' compensation. Costs were calculated according to a formula developed by the National Academy of Social Insurance (NASI), under the guidance of a "Study Panel on Workers' Compensation" comprised of 25 worker' compensation scholars, such as J. Burton.[42] The first component of the cost of workers' compensation insurance is the sum of "direct premiums written" by private and public workers' compensation insurance providers. "Direct premiums written" represent the payments made by employers to their private or public workers' compensation insurance providers. The costs of benefits paid directly by employers to workers' compensation recipients under the employers' deductibles are added to the "direct premiums written." Also added are the benefit payments and administrative costs incurred by employers that are self-insured for workers' compensation. The result is a total workers' compensation employer cost figure for each state. The total workers' compensation employer cost is then divided by total wages for all unemployment insurance-covered employment in the state to yield an effective cost of workers' compensation per dollar of payroll in the state.

Data for the "direct premiums written" were obtained from insurance data consolidator A.M. Best for all states except the five with monopolistic state workers'

[41]The *Significant Provisions of State Unemployment Insurance Laws* bi-annual publication is located at http://workforcesecurity.doleta.gov/unemploy/statelaws.asp#sigprouilaws, accessed on 9/16/2013.
[42] Lists of panel members are published in each annual edition of Workers' Compensation: Benefits, Coverage, and Costs, published by the National Academy of Social Insurance at http://www.nasi.org/research/workers-compensation, accessed 9/22/2013.

compensation insurance agencies. The data for the monopolistic agencies was provided by NASI, which secured its data from the National Association of Insurance Commissioners and state workers' compensation agencies. Costs of benefits paid under deductibles and costs incurred by self-insured employers were also provided by NASI. Data for total wages for all employment in the state are the same data as those used to calculate the unemployment insurance rate variable and were provided by DOLETA.

The workers' compensation cost variable data show the cost to employers for workers' compensation in each state. It is a measure of aggregates, however. A critique of using such data for comparison across states is that it does not take into account differences in industrial structure that may account for differences in costs. [Thomason et al. 2001] The regression analysis undertaken for this dissertation addressed this concern by including controls for industrial structure. Nonetheless, the data do not reveal what the comparable cost would be for an employer in one state relative to the cost to an employer with the exact same workers' compensation risk profile in another state.[43] As such, the workers' compensation cost variable data serve not as a precise measure of but, rather, as an indicator of the relative costs of workers' compensation across states.

It can be argued that the three independent variables of interest in the regression equations are not simultaneously determined with the dependent variable, which constitutes one element of exogeneity. The concentration of THS workers in a state, which had a mean of 1.44% over the 1990 to 2011 period, is highly unlikely to be a systematic driver of policy decisions affecting all firms and/or all workers in the state. In other words, in states where there are more temporary help services workers, we are

[43] Such individual employer workers' compensation insurance cost data are not available.

unlikely to see systematically different policies concerning all workers in unemployment insurance taxation or workers' compensation insurance rates as a result of the larger proportion of THS workers. Decision-making concerning unemployment insurance tax rates is driven principally by unemployment insurance fund balances and expectations of unemployment insurance drawdown. Workers' compensation insurance rates are determined by benefits formulae and actuarial data.

The exogeneity of the policy variables is a necessary condition for claims of causality in findings. The models include controls for many observable factors described below, including, among others, economic growth, industrial structure, and employment trends. The models also control for unobservables that are constant over time within states through the addition of state fixed effects, as well as for unobservables that affect all states in a given year through the addition of year fixed effects. Despite these controls, it is possible that unobservables that vary over time within states remain.[44]

An additional potential challenge to causality is the potential simultaneity of wage variables included to control for variation in wages across states and over time. Strategies utilized to address this are discussed in the section on control variables below. Despite efforts to control for unobservables through fixed effects and to mitigate against possible simultaneity of wage variables, neither can be completely ruled out. As a result, the dissertation cautiously claims causality of the effect of the policy variables of interest on THS employment.

[44] Unobserved variables that could vary within a state over time and that could therefore possibly be sources of endogeneity include state income support policies, the duration of unemployment insurance benefits, age cohorts, and income levels.

Control Variables and Data Sources. This section describes the variables included in the vector of control variables X_{it} .The same set of independent variables was included in both equations (1) and (2), with one exception. A "right to work" variable, which indicates whether a state had a "right to work" law in place, was excluded from model (2) because time constant variables cannot be evaluated with fixed effects models. In no state was a "right to work" law instituted (or overturned) during the study period.

A union membership variable was included as a control variable due to empirical work connecting unionization and level of THS employment. [Hatton 2014] Although there is agreement that unionization has an effect on THS employment, the direction of the effect is unclear. [Kalleberg 2003] Greater unionization could increase the interest of employers in hiring THS workers, while union agreements could reduce the employers' ability to do so. [Capelli and Keller 2013] The union membership variable shows union members as a percent of the employed. The data on union membership are derived from the Bureau of Labor Statistics' Current Population Survey and were provided by staff economists at the Bureau of Labor Statistics' Division of Labor Force Statistics.

An indicator variable as to whether a state has a "right to work" law enacted was included as a control variable because "right to work" laws reduce worker protections and reduced worker protections are associated internationally with lower temporary help employment. [Kahn 2007] The indicator variable of a state with a "right to work" law over the course of the 1990 to 2011 study period was coded as 1 and a state without a "right to work" law over the time frame was coded as 0. The dissertation used the consensus understanding of which states have legislation in place that prohibits employers and unions from enacting agreements requiring all workers in positions or

locations with union representation to become dues-paying members of the union. Twenty two states had "right to work" laws in place during the 1990 to 2011 study period.[45]

Real quarterly economic growth in the current and prior period are the variables that serve as controls for economic growth. As discussed in the theory chapter, changes in economic growth could affect the concentration of THS employment. Since THS contracts have been found to last an average of 13.2 weeks[46], economic growth in the prior as well as the current quarter are included. Because regression post-estimation evaluation of the residuals suggested some possible nonlinearity in the relationship between real quarterly economic growth and THS concentration, the squares of economic growth were included as variables. Figure 8 presents an augmented component-plus-residual plot, also known as an augmented partial residual plot, used to identify nonlinearities in the data for real quarterly economic growth. It shows highly concentrated data points with a slight inverted "U" shape.

Neither nominal nor real state domestic product data by quarter are available for the 1990 to 2011 study period. The U.S. Department of Commerce Bureau of Economic Analysis has produced real GDP by state data for the period only on an annual basis.[47] To calculate real quarterly economic growth by state, the compensation of employees from quarterly personal income data were extracted from the Regional Accounts of the Bureau

45 Indiana and Michigan became the 23rd and 24th states with such legislation in 2012. From the U.S. Department of Labor Wage and Hour Division, located at http://www.dol.gov/whd/state/righttowork.htm, accessed 4/8/2013.

46 From the website of the American Staffing Association at http://www.americanstaffing.net/statistics/top_line_survey_results.cfm, accessed on 1/9/2014.

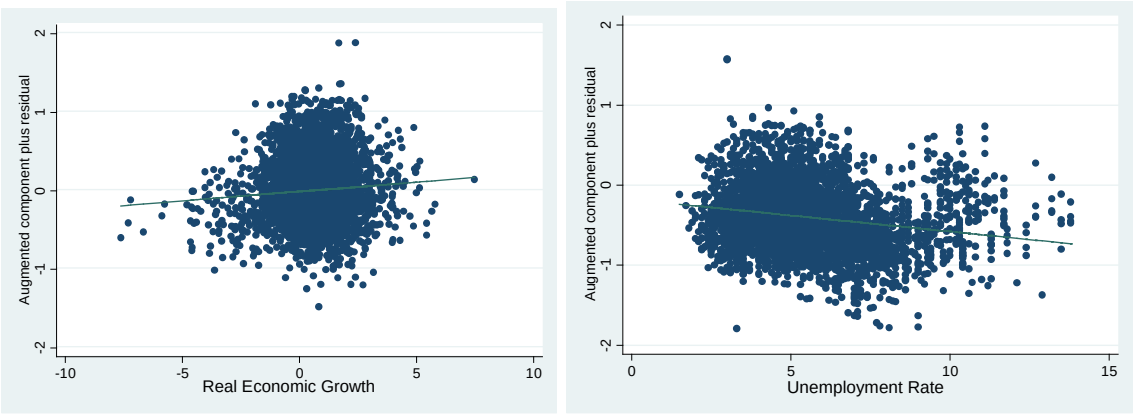
47 The Bureau of Economic Analysis released prototype quarterly GDP by state statistics for 2007 to 2013 in August 2014.

of Economic Analysis.[48] The compensation of employees is a component of GDP and does not include transfers. It is used by the Bureau of Economic Analysis as a proxy for state GDP. The Bureau of Economic Analysis implicit GDP deflator was used to transform the quarterly personal income data from nominal to real.[49]

Quarterly state unemployment rates were drawn from the Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS) database.[50] The rates represent the unemployed as a percentage of the civilian labor force. The squares of quarterly state unemployment rates were included as variables because an augmented component-plus-residual plot showed nonlinearity in the relationship between quarterly state unemployment rates and THS concentration. In Figure 8, a "U" shape in the plot of residuals is apparent.

[48] The data were drawn from the website of the Bureau of Economic Analysis at http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=3#reqid=70&step=1&isuri=1, accessed 4/7/2014.
[49] From the Bureau of Economic Analysis website http://www.bea.gov, accessed 5.8.2014.
[50] From the Bureau of Labor Statistics Local Area Unemployment Statistics website located at http://www.bls.gov/lau/, accessed on 5/9/2014.

Figure 8
Augmented Partial Residual Plots for
Real Economic Growth and Unemployment Rate Variables



The 1990 to 2011 period of study included three recessions ending in March 1991, November 2001, and June 2009.[51] Since these represented departures from the overall trend of economic growth over the period, a recession variable was included to capture differential effects on THS concentration related to recession. More specifically, a variable identifying whether a recession occurred during the prior 2 years was included to estimate any current or persistent effects of recession on THS concentration.

The variance in total employment in the prior 2 years was included in the model as a measure of uncertainty. Total employment was measured as all unemployment insurance-covered workers, and was the same measure used in the calculations of THS concentration, unemployment insurance average effective tax rates, and workers' compensation average costs. Total employment data were drawn from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW). In theory, during periods of greater uncertainty, employers would be more likely to hire THS workers than traditional workers. The estimated aggregate fixed costs of hiring and firing would

[51] Recession dates are from the National Bureau of Economic Research, www.nber.org/cycles.html, accessed on 8/6/14.

increase, creating greater incentive to hire THS workers, as discussed in the theory chapter.

Also extracted from the QCEW were data on employment in three industrial sectors: manufacturing; trade, transportation, and utilities; and professional and business services. Variables representing the employment share of the manufacturing; trade, transportation and utilities; and professional and business services (excluding THS) employment were included in the model as right hand side variables. The share of professional and business services employment excluding THS employment was calculated to avoid correlation in the error term between THS concentration and share of professional and business services.

The objective of including these three variables was to control for differences in industrial structure across states that may account for differences in THS concentration. States with a greater concentration of industries that employ a higher proportion of THS workers would be expected to have a higher THS concentration. Data on THS employment by industry, however, are not available. The available limited data on THS employment by occupation, nonetheless, can provide indicators of which industries may employ a higher concentration of THS workers. A study by Luo, Mann, and Holden [2010] provides a breakdown of THS employment by occupation. The three occupational categories closely correlated with THS usage roughly correspond with the QCEW industrial sectors whose share of employment are included as independent variables: professional and business services; transportation, trade, and utilities; and manufacturing.

In the fixed effects equations, time invariant differences across states in industrial structure were controlled by the state fixed effect indicator variables. Year fixed effect

indicator variables captured national changes in industrial structure over time. Hence, many of the differences in industrial structure across states and time were controlled for by including fixed effects. What were not accounted for in the fixed effects model, however, were state changes in industrial structure over time deviating from national changes in industrial structure. To assure sufficient controls for state changes in industrial structure over time, therefore, variables representing state growth of the manufacturing; trade, transportation, and utilities; and professional and business services (excluding THS) sectors were also included as independent variables. Growth rates were calculated using QCEW sector employment data.

Women's employment was included to control for any possible effects on THS concentration of a differential proportion of employed women across states or over time. A 2005 Contingent and Alternative Employment Arrangements Supplement to the Bureau of Labor Statistics' Current Population Survey had shown that women were more highly represented in the THS worker population than in the traditional worker population.[52] The Bureau of Labor Statistics provided data from the Current Population Survey that measure the percent of the civilian non-institutional population of women who were employed.[53]

The final two independent variables pertained to differences across states in THS weekly wages and the relative weekly wages of THS to all other workers. Data for the average weekly wage rate of THS workers and the average weekly wage rate of all

[52]As presented in Table 1 of the introductory chapter, based on Table 6 of the February 2005 Current Population Survey Contingent and Alternative Employment Arrangements Supplement conducted by the Census Bureau for the Bureau of Labor Statistics, located at http://www.bls.gov/news.release/conemp.t08.htm, accessed on 12/4/2013.

[53] This variable is different from women's labor force participation since it includes only employed women, while women's labor force participation includes both employed and unemployed women.

workers were drawn from the QCEW. The objective of the independent variables was to control for differences in THS concentration due to differences in THS wage rates and the ratio of the wage rate of THS worker to all workers. Endogeneity, however, was a concern that prevented simply including the THS weekly wage rate and the ratio of weekly wage rates as variables. A theoretical case could be made that a change in the level of THS workers in a state could have an effect on the weekly wage rate of THS workers. Since the level of THS workers is one of two components of the proportion of THS workers, the proportion of THS worker could also potentially have an effect on the wage rate of THS workers. If so, one of the classical assumptions on which the advantageous characteristics of OLS regression methodology are based would be violated. The correlation between the wage rate and the error term of the equation to be estimated, therefore, would be non-zero, and OLS estimates would be biased.

The possible endogeneity of the average weekly wage rate of THS labor was addressed through three strategies.[54] First, the proportion of THS employment was used as the dependent variable rather than the level of THS employment. The former, which is a function of both THS employment and total employment, is only partially determined simultaneously. Any simultaneity would be expected to be weaker than if the level of THS employment were the dependent variable. Second, the THS wage variable and the ratio of THS wages to all worker wages variable were dropped. The advantage of this approach was the avoidance of endogeneity; however, omitted variables bias was potentially a hazard.

[54] An instrumental variables estimation approach was rejected due to lack of a strong and valid instrument. If an instrument is either invalid or weak, then the instrumental variable regression analysis can yield results that are biased. [Angrist and Pischke 2009]

A third strategy used lagged variables to address the potential endogeneity. The concentration of THS employment in a time period t cannot affect the average wage rate of temporary help workers in the prior period (t-1) or the ratio of the average wage rate of THS workers to direct hire workers in the prior period (t-1). Yet, the average weekly wage rate of temporary help services employees in a period t is likely to be correlated with the rate in the prior period. The same is true of the ratio of THS wages to all worker wages. The use of a lagged THS wage variable and ratio of THS wages to all worker wages variable maintained some of the variation of the THS wage variable and ratio of THS wages to direct hire worker wages variable, but eliminated the reverse causality.

The use of the lagged variables can be theoretically explained by an adaptive learning model. On the demand side, it may be the case that employers base their decisions on whether to hire a THS worker in the current period based on what they know the wage rate to have been in the prior period, rather than what they predict the wage rate to be in the period under way. Similarly, on the supply side, potential THS workers may decide whether to pursue a temporary help services position in the near future based on temporary help services wage rates in the present. In this way, a case can be made that the lagged THS wage variable would better represent the wage in the model than the current wage variable.[55] A comparison of the findings of regressions run excluding the wage variables and including lagged wage variables is undertaken in the results chapter.

[55] Richard Freeman [1975] uses market information on engineering salaries in the sophomore year of college to model engineering student decision-making regarding occupational choice at the end of college. The "cobweb" model used lagged data to explain a subsequent employment decision. The work showed the use of time differentials in data to be a plausible method. This is analogous to the proposed use of wage data in a prior period to decision- making whether to accept THS employment in the current period.

Alternate Specifications and Models. In order to test the robustness of findings, alternate specifications of the model with state and year fixed effects set out in equation (2) were run. The natural logarithm of the dependent variable, $\ln THS_{it}$, was substituted for the dependent variable THS_{it}. Although the specification used the same variables, it changed the form of the relationship. Regressions with natural logarithms analyze the relationship between geometric means rather than arithmetic means of variables. The ln specification gives less weight to any outliers that may be present in the data. The regression coefficients in the ln model, moreover, represent the percent change on the dependent variable rather than a unit change.

In addition to the natural log specification, a state and year fixed effects specification with a "Great Recession" indicator variable and interacted "Great Recession" variables was run. The "Great Recession" occurred from late 2007 to mid-2009. The "Great Recession" variables were in addition to the more general "recession in the prior two years" indicator variable and the year fixed effects. The specification was intended to ascertain whether the "Great Recession" had an effect on the variables of interest different than any other recession or year time period.

While the dissertation analysis sought to determine the effect of unemployment insurance taxes, the unemployment insurance tax gradient, and workers' compensation costs on the proportion of THS workers in the state, alternate models were also explored. In these models, the level of THS employment in the state was the dependent variable. Rather than scaling for the size of state employment by using a proportion, state total employment was included as an independent variable. These models could be considered different specifications that control differently for state size. On the other hand, the

dependent variable, population of THS workers, is different than the dependent variable in models discussed previously, proportion of THS workers. The findings report different relationships, as a result. Hence, they are treated as distinct models.

The first alternate model is represented by equation (3). Where i is state, t is time/quarter, THSpop is the total population of temporary help services workers, TE is total employment, UIR is the state unemployment insurance tax rate variable, UIG is the state unemployment insurance tax gradient, WC is workers' compensation costs, α_i is unobserved state characteristics, λ_t is unobserved time characteristics, X is a vector of control variables, and u is an error term:

$$(3) \quad THSpop_{it} = \beta_0 + \beta_1 TE_{it} + \beta_2 UIR_{it} + \beta_3 UIG_{it} + \beta_4 WC_{it} + \beta_5 X_{it} + \alpha_i + \lambda_t + u_{it}$$

In addition to the above model, a specification with the natural logarithm of $THSpop_{it}$ as the dependent variable and the natural logarithm of TE_{it} as an independent variable was run.

The primary disadvantage of the model with total THS employment levels as the dependent variable concerns simultaneity between the quantity of THS employment and total employment. THS hires and traditional direct hires are determined simultaneously. This source of simultaneity is not readily addressed in the absence of a strong and valid instrument and could cause bias in the coefficients. Hence, although the alternate models were explored, their findings were given less attention and weight than the primary models set out in equations (1) and (2).

Study Time Period. The study period for analysis of unemployment insurance variables was 1990-2011. In 2001, QCEW data collection transitioned from the Standard

Industry Classification (SIC) system to the North American Industrial Classification System (NAICS). The Bureau of Labor Statistics, however, made available QCEW data from 1990 to 2000 converted to NAICS codes from the prior SIC codes. A review of literature concerning the conversion showed that the temporary help services industry had not been identified as one of the sectors having undergone classification changes that would make the time series data inconsistent.[56] Data for all of the independent variables could be obtained from 1990 to 2011 with the exception of the workers' compensation insurance average cost variable. The detailed data inputs required to calculate accurately the workers' compensation insurance average costs, were not available for the entire study period. Regressions to assess the effects of workers' compensation on THS employment concentrations across states were run for 2001 to 2011.

Data Descriptive Statistics. Table 2 presents descriptive statistics of the data for the variables employed in the regression analysis. The concentration of temporary help services workers varied substantially across states and over time, with a mean of 1.44 percent and a standard deviation of 0.59 percent from 1990 to 2011. Unemployment insurance average effective tax rates similarly exhibited noteworthy variation over states and over time, with a mean of 0.59 percent -- or 59 cents per 100 dollars of payroll – and a standard deviation of 0.28 percent. The unemployment insurance tax gradient exhibited more variation across states than over time within states. Changes in the statutory unemployment insurance minimum and maximum tax rates tended to be incremental. The

[56] See, for example Implementing The North American Industry Classification System at BLS. Murphy, John B., and Walker, James A., *Monthly Labor Review*, December 2001. A First Look at Employment and Wages Using NAICS. Hiles, David R.H., *Monthly Labor Review*, December 2001. , accessed at http://www.bls.gov/bls/naics_papers.htm.

mean unemployment insurance tax gradient was 6.45 percent with a standard deviation of 1.72 percent.

Table 2
Descriptive Statistics of Variables Across the 50 U.S. States, 1990-2011

VARIABLES	Mean	Minimum	Maximum	Standard Deviation
THS Concentration	% 1.44	0.18	3.88	0.59
Unemployment Insurance Average Effective Tax Rate	% 0.59	0.08	1.98	0.28
Unemployment Insurance Tax Gradient	% 6.45	1.40	11.32	1.72
Worker's Compensation Insurance Average Cost*	% 1.53	0.64	6.46	0.60
Union Membership	% 12.49	2.30	29.30	5.85
THS Weekly Wage	$408.87	195.51	883.70	99.30
THS/Total Employment Wage Ratio	0.55	0.37	1.00	0.08
Real Economic Growth	% 0.61	-7.63	7.48	1.27
Unemployment Rate	% 5.57	1.50	13.80	1.91
Manufacturing Share of Employment	% 12.41	2.17	27.17	5.21
Trade Transportation and Utilities Share of Employment	% 20.09	15.67	26.87	1.46
Professional and Business Services Share of Employment	% 9.35	3.80	32.89	2.42
Manufacturing Sector Growth	% -0.31	-2.79	2.54	0.37
Trade Transportation and Utilities Sector Growth	% -0.08	-7.44	7.10	0.40
Professional and Business Services Sector Growth	% 0.13	-22.29	24.64	0.59
Women's Employment	% 57.32	40.00	68.90	4.75

*Data for this variable are from the period 2001-2011.

Union membership also varied across states with a minimum of 2.3 percent of worker union membership in North Carolina and a maximum of 29.3 percent in Hawaii. Over time within states, union membership declined during the study period, with a high of a 14.70 percent mean across states in 1991 to a low of 10.88 percent in 2011. A declining trend in level of unionization persisted over the 20 year period. The mean real temporary help services worker weekly wage in 2009 dollars was $409 with a standard

deviation of $99. Nebraska posted the lowest THS wage at $196 per week while Alaska paid the highest THS weekly wage at $884, which was roughly equivalent to the average total weekly wage in Alaska. On average, however, THS workers earned only 55 percent of the weekly wages of all workers across the 50 states over the study period.

The descriptive statistics in Table 2 summarize the data for the 50 U.S. states for the time period from 1990 to 2011 for all variables except workers' compensation insurance average costs. The statistics for workers' compensation insurance average costs summarize data from 2001 to 2011, as discussed above. The mean worker's compensation insurance average costs were 1.53 percent - or $1.53 per $100 of payroll - over the eleven -year period, with a high of 1.73 percent in 2001 and low of 1.31 percent in 2010. The standard deviation on average across states of 0.60 percent indicates a moderate degree of variation within states in worker's compensation insurance average costs.

Chapter 5: Results

While theory suggests that policy factors that increase the relative costs of direct hire traditional workers compared to temporary help services workers could increase the concentration of THS employment, whether increases in unemployment insurance and workers' compensation costs, in fact, affect the concentration of THS employment is an empirical question. OLS regression analysis without and with fixed effects was undertaken to answer this question. The findings of the regression analysis are reported in this chapter. Conclusions regarding the dissertation hypotheses are then drawn.

The reporting and discussion of the results of the regression analysis of the unemployment insurance variables will be presented separately from the results of the regression analysis of the workers' compensation variable due to differences in their time frames, discussed in the methodology chapter. The data for analysis of unemployment insurance variables spanned the 1990 to 2011 period, while the data for analysis of workers' compensation variables extended from 2001 to 2011. Results of the regression analysis of the effects of the unemployment insurance average effective tax rate and the unemployment insurance tax gradient follow first.

Unemployment Insurance. A series of four main regression models were run to determine the effects of the state unemployment insurance average effective tax rate and unemployment insurance tax gradient on the concentration of THS workers in the state. Two specifications were OLS models, the third included state fixed effects, and the fourth included both state and year fixed effects. The output from these regression analyses is reported in Table 3. Columns (1) and (2) of the table present the results of the OLS regressions of the panel data. The model for column (1) excludes the THS average

weekly wage and the ratio of THS wages to total wages as independent variables, while the model for column (2) includes the THS industry average weekly wage and the ratio of THS worker average weekly wages to the average wages of all workers lagged by one quarter.

The differences between columns (1) and (2) reflect strategies employed to address potential endogeneity of the wage variables, discussed in detail in the methodology chapter. In brief, the wage variables were excluded from the regression whose results are presented in column (1). This approach eliminates endogeneity but may cause omitted variable bias. The second approach, whose results are set forth in column (2), included lagged wage variables to address the possible endogeneity. The use of a lagged THS wage variable and ratio of THS wages to all worker wages variable maintained some of the variation of the THS wage variable and ratio of THS wages to direct hire worker wages variable, but eliminated the reverse causality.

The OLS results in columns (1) and (2) of Table 3 show that the unemployment insurance average effective tax rate has a significant positive effect on THS employment concentration with significance at the 1 percent level. In other words, an increase in unemployment insurance tax costs leads employers, in the aggregate, to hire a greater proportion of temporary help services workers. The unemployment insurance tax gradient also has a significant positive effect on THS employment concentration with significance at the 1 percent level, according to the OLS results in Table 3 columns (1) and (2). That is, an increase in unemployment insurance tax gradients leads employers, in the aggregate, to hire a greater proportion of temporary help services workers.

Table 3
Determinants of Temporary Help Services Concentration by State, 1990-2011

VARIABLES	(1) OLS	(2) OLS	(3) State Fixed Effects	(4) State & Year Fixed Effects
Unemployment Insurance Average Effective Tax Rate	0.139***	0.155***	0.189***	0.121***
	(0.0351)	(0.0339)	(0.0262)	(0.0259)
Unemployment Insurance Tax Gradient	0.0264***	0.0197***	-0.00269	0.00738**
	(0.0040)	(0.0039)	(0.0040)	(0.0036)
Right to Work Law	0.0235	0.00222		
	(0.0200)	(0.0198)		
Union Membership	-0.0160***	-0.0266***	-0.0597***	-0.0334***
	(0.0018)	(0.0018)	(0.0031)	(0.0031)
Real Economic Growth	0.0172***	0.0289***	0.00968***	0.00596**
	(0.0057)	(0.0055)	(0.0029)	(0.0028)
Square of Real Economic Growth	-0.00418**	-0.00663***	-0.00149	0.000884
	(0.0018)	(0.0018)	(0.0009)	(0.0009)
Real Economic Growth (lagged)	0.0195***	0.0171***	0.0174***	0.0193***
	(0.0058)	(0.0056)	(0.0029)	(0.0027)
Square of Real Economic Growth (lagged)	-0.00600***	-0.00755***	-0.00497***	-0.00330***
	(0.0018)	(0.0017)	(0.0009)	(0.0008)
Recession in Prior 2 Years	-0.121***	-0.123***	-0.0838***	-0.0276***
	(0.0190)	(0.0183)	(0.0100)	(0.0095)
Variance in Total Employment Prior 2 Years	4.95e-08**	3.57e-08*	-1.19e-07***	-5.86e-08***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Unemployment Rate	-0.101***	-0.106***	-0.184***	-0.0937***
	(0.0184)	(0.0178)	(0.0100)	(0.0100)
Square of Unemployment Rate	0.00490***	0.00528***	0.00842***	0.00305***
	(0.0013)	(0.0012)	(0.0007)	(0.0007)
Manufacturing Share of Employment	0.0584***	0.0506***	-0.0468***	-0.0262***
	(0.0016)	(0.0017)	(0.0028)	(0.0032)
Manufacturing Sector Growth	-0.0475**	-0.0210	0.0765***	0.0549***
	(0.0197)	(0.0191)	(0.0105)	(0.0111)
Trade Transportation and Utilities Share of Employment	-0.0109**	-0.00731	0.00729	0.0231***
	(0.0056)	(0.0055)	(0.0077)	(0.0076)
Trade Transportation and Utilities Sector Growth	0.0514***	0.0553***	0.00480	-0.00519
	(0.0171)	(0.0165)	(0.0094)	(0.0087)

VARIABLES, cont.	(1) OLS	(2) OLS	(3) State Fixed Effects	(4) State & Year Fixed Effects
Professional and Business Services Share of Employment	0.144***	0.103***	0.00511	-0.0155***
	(0.0035)	(0.0042)	(0.0061)	(0.0056)
Professional and Business Services Growth	-0.0572***	-0.0402***	0.0117*	0.0197***
	(0.0115)	(0.0111)	(0.0063)	(0.0056)
Women's Employment	-0.0276***	-0.0279***	0.0240***	0.00465*
	(0.0019)	(0.0018)	(0.0027)	(0.0025)
THS Average Weekly Wage (lagged)		0.00198***	-0.00126***	-0.00279***
		(0.0001)	(0.0001)	(0.0002)
THS/Total Employment Wage Ratio (lagged)		-2.613***	0.712***	1.607***
		(0.1515)	(0.1211)	(0.1214)
Observations	3,928	3,926	3,926	3,926
R-squared	0.477	0.514	0.487	0.602
Number of State Clusters			50	50

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results of the regression analysis of the model with state fixed effects are shown in column (3) of Table 3. The effects of the unemployment insurance average effective tax rate on THS employment concentration remain positive and significant at the 1 percent level. This implies that within states, increases in unemployment insurance average tax rates lead to increases in THS employment concentration. The effect of the unemployment insurance tax gradient on THS employment concentration, however, loses significance when considered only within states. The null hypothesis of no effect on THS employment concentration cannot be rejected. Given the limited variation of the tax gradient within states, this result is not surprising.

Column (4) of Table 3 presents the results of the regression analysis of the model with state and year fixed effects. The effects of the unemployment insurance average

effective tax rate on THS employment concentration continue to remain positive and significant at the 1 percent level. That is, within states, notwithstanding idiosyncratic change by year due to national factors, increases in unemployment insurance average tax rates lead to increases in THS employment concentration. According to the results of column (4), a one percentage point increase in the unemployment insurance average tax rate leads to a 0.121 percentage point increase in the concentration of THS workers in the state. The magnitude of the effect is fairly consistent across the four model specifications, with an estimated effect ranging from 0.121 to 0.189 percentage points from a one percentage point increase in the effective tax rate.

Although small, the size of the impact of unemployment insurance costs on THS concentration can be considered significant economically. The results of the state and year fixed effects model are used to consider economic impact. If the unemployment insurance average effective tax rate were to increase from the minimum of .08 percent to the maximum of 1.98 percent, THS concentration would increase by 0.23 percentage points. For example, at the mean of THS concentration across states over the study period, this would correspond to an increase in THS concentration from 1.44 percent to 1.67 percent. In other words, an increase in the unemployment insurance average tax rate from its minimum to its maximum would lead to a 15.97 percent increase in THS concentration.

When year fixed effects, as well as state fixed effects, are included in the model, the influence of the unemployment insurance tax gradient on THS employment concentration regains significance at the 5 percent level. The magnitude of the effect, however, is substantially lower than in the OLS models without fixed effects. As shown

in column (4) of Table 3, in the model with state and year fixed effects, a one percentage point increase in the unemployment insurance tax gradient leads to a 0.007 percentage point increase in the concentration of THS workers in the state. In the OLS models, shown in columns (1) and (2), the effects are 0.026 and 0.020, respectively.

The magnitude of the impact of changes in the unemployment insurance tax gradient is very small, if the results of the state and year fixed effects model are used to evaluate economic impact. An increase in the unemployment insurance tax gradient from the minimum of 1.4 percent to the maximum of 11.32 percent would lead to an increase in THS concentration of .07 percentage points. For example, at the mean across states over the study period, THS concentration would increase from 1.44 percent to 1.51 percent – a 5.08 percent increase in THS concentration. Despite statistical significance, changes in the unemployment insurance tax gradient have modest effects economically.

Union Membership and "Right to Work" Laws. The results concerning the effect of the proportion of the workforce that holds membership in unions on the concentration of THS workers are interesting enough to warrant discussion. In all four models in Table 3, union membership is found to have a negative effect on THS employment concentration at a 1 percent level of significance. According to the results of the state and year fixed effects model presented in column (4), a one percentage point increase in union membership in a state is associated with a .033 percentage point decrease in THS employment concentration. The negative sign of the result is consistent with recent literature demonstrating that employers use temporary help services workers to undermine the strength of unions [Hatton 2014] The findings of the regression analysis reported in Table 3, however, show that the effect size of the association between

unionization and THS concentration is extremely small when controls for policy, economic, and industrial structure factors are included in the models. The effect size is much smaller than that of the unemployment insurance average effective tax rate.

With controls for union membership, the effect of having a "Right to Work" law in place in a state was found to be insignificant. We cannot reject the null hypothesis that having a state "Right to Work" law has no independent effect on THS concentration outside its effect on union membership.[57] The effect of having a "Right to Work" law in place in a state could only be estimated using the pooled OLS models. Because the "Right to Work" status of the states was constant over the 1990 to 2011 study time period, its effect could not be estimated with state fixed effects models.

Other Control Variables. Table 3 presents the coefficients for the control variables, as well as the policy variables of interest. These provide insight into the determinants of THS employment concentration. Real economic growth in the current and prior period is shown to have a positive non-linear effect on the concentration of THS employment at a 1 percent significance level in the OLS models presented in columns (1) and (2). According to models (3) and (4) that include state fixed effects, real economic growth in the current quarter has a linear positive effect at a 5 percent significance level while real economic growth in the prior quarter has a positive non-linear effect on the concentration of THS employment at a 1 percent significance level. These results show that in periods of growth, THS workers are hired more frequently relative to total hiring whereas in periods of downturn, THS workers are more frequently

[57] When union membership is excluded from the regression analysis, "Right to Work" laws have a positive, statistically significant effect on THS concentration. The presence of "Right to Work" laws and the proportion of workers who are union members are highly negatively correlated.

let go than the totality of all hires. This is consistent with the greater volatility of THS employment than total employment.

The negative effects of a recession on THS employment are persistent, moreover, according to the regression analysis. In all four models, up to two years after a recession, THS concentration is lower than would be the case without a recent recession. The coefficient on the recession variable is significant at a 1 percent level in all four models.

The variance in total employment of the prior two years is included in the models as a measure of uncertainty. In theory, during periods of greater uncertainty, employers would be more likely to hire THS workers than traditional workers. The results from the OLS models indicate a minute positive effect of the variance in total employment on THS concentration. The models with fixed effects, however, indicate a minute negative effect of the variable. The findings with regard to this variable are inconclusive, given the difference in signs. The effect of the variance in total employment of the prior two years on THS concentration may be negligible, or the variable may be a weak indicator of employer uncertainty.

The unemployment rate has a negative non-linear relationship with THS concentration according to all four models with a 1 percent level of significance. As the unemployment rate increases, THS concentration decreases. This is consistent with findings by Houseman [2003] of increases in THS employment in tight labor markets.

The share of manufacturing, of trade, transportation and utilities, and of professional and business services (excluding THS) are all included as independent variables that, as a group, control for the industrial structure of the state economies. An F-

test on the coefficients of this set of variables reveals that, as a group, they do have significant explanatory value. The significance and signs of the effects of the individual variables, however, vary across the models.

According to the OLS results in columns (1) and (2), a higher share of manufacturing and of professional and business services is associated with a higher share of THS worker concentration. This is consistent with the occupational breakdown of THS employment, presented in the introduction, which shows a high proportion of THS workers in production and office jobs. In the state and fixed effects model in column (4), while an increase within the state in the share of professional and business services is associated with an increase in THS concentration, an increase within the state of the share of manufacturing is associated with a decrease in THS concentration. The latter result is not consistent with theory, which would predict an increase in THS concentration due to an increase in the share of manufacturing either within a state or across states.

The rate of growth of the manufacturing and the professional and business services sectors are similarly shown to have explanatory value in the model, but with varying estimates across models. According to the OLS results in columns (1) and (2), higher growth of manufacturing and of professional and business services is associated with a lower share of THS worker concentration. In the state and year fixed effects specifications in columns (3) and (4), however, greater manufacturing growth and professional and business services growth are associated with an increase in THS employment concentration. The findings of the OLS regressions without fixed effects are inconsistent with theory, and may be anomalous. Alternatively, the findings may suggest that states with relatively higher growth of manufacturing and professional and business

services tend to have lower THS concentration, whereas within a state, periods of higher growth of manufacturing and professional and business services are associated with higher THS concentration.

The OLS specifications in columns (1) and (2) show that greater labor force participation by women is associated with a lower level of THS concentration. Greater women's labor force participation, however, is associated with a higher level of THS concentration at the 1 percent and 10 percent levels of significance, respectively, according to results from the state fixed effects model in column (3) and the state and year fixed effects model in column (4). This may suggest that while states with greater labor force participation by women tend to have lower THS concentration, within a state, periods of greater labor force participation by women are associated with greater THS concentration. Given the 10 percent significance level of the result of the state and year fixed effects model, however, the finding cannot be considered robust.

The results of the regression analysis concerning the included wage variables are contradictory.[58] The coefficient for the lagged THS average wage is positive in the OLS specification in column (2), but is negative in the models with fixed effects in columns (3) and (4). Theory would predict a negative relationship in which THS concentration decreases as THS wages increase, as in the models with fixed effects. The estimates of the coefficients for variables of interest from the OLS model with the lagged wage variables are not substantially different than the estimates of coefficients from the model

[58] Fixed effects regressions were also run without the wage variables. The coefficient for the unemployment insurance average effective tax rate was significant and slightly larger in both fixed effects regressions. The coefficient for the unemployment insurance tax gradient was significant only at the ten percent level, however. Due to potential omitted variable bias in these regressions, the coefficients of the regressions with lagged wage variables were reported in Table 2.

where the wage variables are removed, mitigating concern about possible bias due to endogeneity of the lagged wage variables. Nonetheless, it is unclear why the relationship in the OLS model without fixed effects is positive. It may be that across states, states with higher lagged THS average wages have greater THS concentration because the supply of THS workers is greater with the higher wages. Within states, however, demand factors may prevail such that THS concentration decreases with higher wages.

Theory would predict that the ratio of THS wages to total employment wages would be negatively related to THS concentration. Higher wages of THS workers compared to all workers would be associated with a decrease in THS concentration. That is the finding in the OLS model in column (2). In the fixed effects models, the coefficients for the ratio of THS to total employment wages are positive. The positive relationship may be driven by labor supply factors. More workers may be willing to accept THS jobs when the wages of THS jobs more closely approximate those of direct hire jobs. Alternatively, because the variable "THS/Total Employment Wage Ratio" represents a comparison of aggregates, it may ineffectively represent the relative wages of workers in THS jobs compared to the wages of direct hire workers in similar jobs.

Robustness Checks for Unemployment Insurance Findings. The results from the regression analysis of the four main model specifications, set out previously in Table 3, are consistent in terms of the effect of the unemployment insurance average effective tax rate on the temporary help services employment concentration in the state. All models show a significant effect with a comparable order of magnitude. The findings regarding the effect of the unemployment insurance tax gradient are somewhat less consistent, but still support the assertion of a small positive effect of the unemployment insurance tax

gradient on the THS concentration in the state. In order to check the robustness of these findings, regressions of alternative specifications of the models with proportion of THS employment as the dependent variable and regressions of alternative models that have the quantity of THS employment as the dependent variable were run. States and year fixed effects were included in all of these alternative specifications and models. The results of these regressions are presented in Tables 4 and 5.

Column (2) of Table 4 shows the results of a model specification with the natural logarithm of THS concentration as the dependent variable. Converting the variables to their natural logarithms allows nonlinearity in the variables while maintaining linearity in the coefficients. In other words, using natural logarithms changes the functional form of the relationships from having constant slopes to having constant elasticities. In the log specification of the state and year fixed effects model in column (2), the coefficients for the unemployment insurance tax gradient and the unemployment insurance average tax rate variables are both significant at the 1 percent level. The exponentiated value of the coefficient for the unemployment insurance tax gradient variable is 0.120 percentage points and for the unemployment insurance average tax rate variable is 0.009 percentage points. These values are similar to the coefficients from the state and year fixed effects model specification in column (4) of Table 2, copied in column (1) of Table 4. This affirms the robustness of the findings of the main model specifications[59].

[59] OLS models without fixed effects and with only state fixed effects were also run with the natural log of THS concentration as the dependent variable. These all yielded statistically significant and qualitatively similar coefficients for the unemployment insurance variables.

Table 4
Alternative Specifications with State and Year Fixed Effects

VARIABLES	(1) Y = THS Concentration	(2) Y = ln THS Concentration	(3) Y = THS Concentration w/Great Recession
Unemployment Insurance Average Effective Tax Rate	0.121***	0.113***	0.0863***
	(0.0259)	(0.0176)	(0.0263)
Unemployment Insurance Tax Gradient	.00738***	0.00927***	-0.00274
	(0.0036)	(0.0025)	(0.0039)
Great Recession			0.377***
			(0.0514)
UI Average Effective Tax Rate * Great Recession			0.170***
			(0.0325)
UI Tax Gradient *- Great Recession			0.0250***
			(0.0042)
Economic Controls	Yes	Yes	Yes
Industrial Structure Controls	Yes	Yes	Yes
Wage Controls (lagged)	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	3,926	3,926	3,926
R-squared	0.699	0.651	0.609
Number of State Clusters	50	50	50

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Another model specification, presented in column (3) of Table 4 includes a "Great Recession" indicator variable and interacted Great Recession variables on the right hand side of the equation. The main models in Table 3 all included a recession variable to control for any effects of any of the three recessions during the study period from 1990 to 2011 on THS concentration. The alternative specification in Table 4 column (4) includes the same independent variables as Table 3 specifications, and also adds indicator and interactive variables specific to the Great Recession. The results reveal a higher THS

concentration during the Great Recession than before. The results also show that the unemployment insurance average effective tax rate had a stronger positive effect on state THS concentration during the Great Recession through 2011 of 0.256 percentage points per one percentage point change in the rate. During the Great Recession through 2011, moreover, the unemployment insurance tax gradient had a positive effect that was 0.250 percentage points per one percentage point increase in the tax gradient higher than before the recession. In other words, increases in both the unemployment insurance average effective tax rate and tax gradient caused greater increases in THS concentration during the Great Recession through 2011 than during prior periods of growth or recession. The implications of this finding for policy are discussed in the next chapter.

Regressions with the level of THS employment, rather than THS concentration, as the dependent variable were run. The results of two such models are presented in Table 4. The results are provided, however, with a cautionary note that the coefficients may suffer from bias due to simultaneity of the total employment and wage variables with THS employment. Hence, although an interesting exercise as an adjunct to the main models, the findings of these models cannot be considered sufficiently reliable to serve as a basis for policy recommendations.

In the column (1) regression presented in Table 5, the level of THS employment in the state served as the dependent variable and the level of total employment in the state was added to the set of independent variables as a scaling variable. Although the resultant coefficient for the unemployment insurance average effective tax rate variable was similar to those of the regressions with THS concentration as the dependent variable, it was not statistically significant. One possible explanation is that the unemployment

insurance average tax rate influences the decision whether to hire a THS worker versus a direct hire worker and thereby the THS concentration, as suggested by theory, but is not determinant of the total number of THS workers hired. THS employment levels are positively and statistically significantly correlated with total employment levels, as well as with real economic growth variables. Total THS employment is correlated with economic growth to a greater degree than total employment, consistent with the greater volatility of THS employment.

Table 5
Alternative Models with Level of THS Employment as the Dependent Variable and with State and Year Fixed Effects

VARIABLES	(1) Y = THS Employment Levels	(2) Y = ln THS Employment Levels
Unemployment Insurance Average Effective Tax Rate	0.164	0.105*
	(1.0626)	(0.0614)
Unemployment Insurance Tax Gradient	-0.183	0.0109
	(0.1488)	(0.0077)
Total Employment	0.0272***	
	(0.0006)	
ln Total Employment		1.404***
		(0.1867)
Economic Controls	Yes	Yes
Industrial Structure Controls	Yes	Yes
Wage Controls (lagged)	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	3,926	3,926
R-squared	0.699	0.784
Number of States	50	50

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

When the natural logarithm of the level of THS employment was substituted for the dependent variable and the natural logarithm of the level of total employment was included as an independent variable, the coefficient for the unemployment insurance average effective tax rate became more significant, although at a 10 percent level, which is higher than the traditional standard for statistical significance. The results of this model are set out in column (2) of Table 5. This result indicates that there is a stronger nonlinear relationship between the unemployment insurance average effective tax rate and THS employment than linear relationship. It also suggests that the central tendency may be more pronounced when outliers are given less weight in the model. Exponentiating the coefficient for the unemployment insurance average effective tax rate yields an estimate of a 0.11 percentage point effect for a one percentage point increase in the rate, which is of similar magnitude to the effect found by the model with THS concentration as the dependent variable and with state and year fixed effects in column (4) of Table 3.

In neither of the models where the THS employment level is the dependent variable, in columns (1) or (2), is the coefficient for the unemployment insurance tax gradient significant. In these models, the null hypothesis that the unemployment insurance tax gradient in a state has no effect on the level of THS employment in the state cannot be rejected. Even though the unemployment insurance tax gradient appears to have a very small effect on the ratio of THS labor to all labor, as evidenced by the coefficients from models run with THS concentration as the dependent variable, an effect on the total quantity of THS labor is not found by models run with level of THS employment as the dependent variable. This suggests that the unemployment insurance tax gradient may influence the degree of substitution of THS labor for total labor, but

may not be determinant of the quantity demanded of THS labor, which is closely correlated with economic growth variables.

Workers' Compensation Insurance. Table 6 presents the output from the regression analyses of five models. The objective of these analyses was to determine the effects of state average workers' compensation insurance costs on the concentration of THS workers in the state. Columns (1) and (2) report the results of OLS models. Columns (3) and (4) report the results of models with fixed effects. The independent variables are the same as in the models of the effects of unemployment insurance variables on THS concentration. The time period of the analysis is 2001 to 2011.

The findings of the two OLS models are inconsistent. In the OLS model that does not include wage variables in column (1), the effect of workers' compensation insurance costs is negative at -0.0626 percentage points and significant at the 1 percent level. The OLS model in column (2), which includes lagged wage variables, shows a much smaller and statistically insignificant effect. OLS model (1) may suffer from omitted variable bias due to the exclusion of wage variables as a strategy to address potential simultaneity of THS concentration and THS wage variables. Hence, the that the null hypothesis that the average workers' compensation costs in a state have no effect on the concentration of THS workers in a state is the finding of the preferred OLS model without fixed effects.

Table 6
Workers Compensation and Temporary Help Services Concentration, 2001-2011

VARIABLES	(1) OLS	(2) OLS	(3) State Fixed Effects	(4) State & Year Fixed Effects	(5) Great Recession
Workers' Compensation Insurance Rate	-0.0626***	-0.0232	-0.0553***	-0.0267*	-0.0240*
	(0.0174)	(0.0173)	(0.0138)	(0.0139)	(0.0139)
WCIR * Great Recession					0.0671***
					(0.0140)
Unemployment Insurance Controls	Yes	Yes	Yes	Yes	Yes
Economic Controls	Yes	Yes	Yes	Yes	Yes
Industrial Structure Controls	Yes	Yes	Yes	Yes	Yes
Wage Controls (lagged)	No	Yes	Yes	Yes	Yes
State Fixed Effects	No	No	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Great Recession Indicator	No	No	No	No	Yes
Observations	2,200	2,200	2,200	2,200	2,200
R-squared	0.593	0.626	0.480	0.524	0.529
Number of States			50	50	50

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The findings of the two fixed effects models are also inconsistent. According to the state fixed effects model in column (3), the average workers' compensation insurance costs have a negative effect on the state temporary help services employment concentration. That is, within states, in periods when state workers' compensation costs are lower, the concentration of THS workers is higher. However, when year fixed effects

are added to the model, the significance of the coefficient for the workers' compensation insurance rate rises to 10 percent, above the traditional level required for statistical significance, as shown in column (4). The model with state and year fixed effects in column (4) has more stringent controls due to the addition of year fixed effects. Thus, the finding that does not attain the traditional 5 percent norm for statistical significance can be considered more robust. The null hypothesis that the average workers' compensation costs in a state have no effect on the concentration of THS workers in a state is not rejected by the preferred OLS model with fixed effects.

The regression analysis, therefore, does not support the hypothesis that higher workers' compensation costs led to a higher level of temporary help services employment concentration over the eleven year period from 2001 to 2011. The analysis in column (5) reveals, however, a significant positive effect of workers' compensation costs on THS concentration during the Great Recession and through 2011. The reason for the switch from a negative sign on the coefficient over the entire study period to a positive sign during the Great Recession is unclear. One possible explanation is nonlinearities in the relationship, given that both workers' compensation costs and THS employment exhibit cyclicality related to macroeconomic change.

The coefficient on the interactive variable "workers' compensation insurance rate * Great Recession" is positive and statistically significant at the 1 percent level. A one percentage point increase in workers' compensation insurance costs led to a 0.067 percent greater increase in THS employment concentration during the Great Recession through 2011 than it did in the period from 2001 up to the Great Recession. Even if the negative effect prior to the Great Recession is treated as significant, the negative effect of

-0.024 percent is lower than the statistically significant positive effect of 0.067 percent during the Great Recession through 2011. Hence, it is possible to assert that workers' compensation insurance costs had a positive effect on THS employment concentration during the Great Recession through 2011. This result is consistent with the dissertation hypothesis.

The size of the impact of workers' compensation costs on THS concentration during the Great Recession through 2011 is economically significant. An increase in the average workers' compensation insurance costs from the minimum of 0.64 percent of total wages to 6.46 percent would have led to a 0.39 percentage point increase in THS concentration during the Great Recession through 2011. If the negative effect of the workers' compensation insurance rate is treated as significant, the increase would have been 0.25 percentage points.

It is possible that the start of the Great Recession represented a break point in the relationship between the average workers' compensation insurance costs in a state and THS concentration in the state. Average workers' compensation insurance costs may have begun to exert a positive effect on THS concentration starting at the inception of the Great Recession. The short duration and economically unusual nature of the period over which workers' compensation insurance costs are shown to have had a positive effect on THS concentration, however, make it risky to assert that the finding would apply to subsequent time periods. The questionable external validity of the finding of a positive effect of average workers' compensation costs on THS concentration during the period of the Great Recession is taken into account in the discussion of policy implications of the results of the regression analysis.

Results and the Dissertation Hypotheses. The regression analyses tested three hypotheses. The first hypothesis asserted that, "States with higher average unemployment tax rates have a higher proportion of temporary help services workers than states with lower average unemployment tax rates." The results of the regression analyses robustly support this hypothesis. A range of specifications without and with fixed effects produced statistically significant estimates of coefficients for the average unemployment tax rate variable. The coefficients are positive, as theorized. The analyses demonstrate that an increase in the average unemployment tax rate leads to a small, but significant, increase in the concentration of THS workers in the state. An increase in the average unemployment tax rate from the minimum to the maximum across states would lead to an increase in the proportion of THS workers of 15.97 percent.

The second hypothesis postulated that, "States with a greater unemployment insurance tax gradient have a higher proportion of temporary help services workers than states with a smaller unemployment insurance tax gradient." The preferred specification with state and year fixed effects yielded a positive, statistically significant coefficient for the unemployment insurance tax variable, as did the OLS models without fixed effects and the natural log specification with state and year fixed effects. All specifications but one showed a significant positive relationship between the unemployment insurance tax gradient and the proportion of THS workers in a state. The specification with state but no year fixed effects was the exception, with an insignificant finding. As a group, the results support the hypothesis that states with a greater unemployment insurance tax gradient have a higher proportion of THS workers than states with a smaller unemployment tax gradient. The magnitude of the economic impact of the unemployment insurance tax

gradient, however, is small. An increase in the unemployment insurance tax gradient from the minimum to the maximum across states would lead to an increase in the proportion of THS workers in a state of 5.08 percent.

The third hypothesis asserted that, "States with higher workers' compensation insurance costs have a higher proportion of temporary help services workers than states with lower workers' compensation insurance costs." The results of the regression analysis did not support the hypothesis. The preferred specification with state and year fixed effects yielded a statistically insignificant coefficient for the average workers' compensation insurance costs variable. The results of the OLS models without fixed effects were inconsistent, with one generating a negative statistically significant result and the other generating a statistically insignificant result. Neither supported the positive relationship between workers' compensation insurance costs and THS concentration that was hypothesized.

When a Great Recession indicator variable and Great Recession interactive variables were added to the state and year fixed effect specification, however, a statistically significant finding of a positive relationship between average workers' compensation insurance costs and the proportion of THS employment in a state during the Great Recession through 2011 was found. The atypical nature of the Great Recession period and the short duration of the time period covered by the regression analysis imply that the finding has weak external validity. Its applicability to subsequent time periods is therefore uncertain. Further analysis including a longer time frame following the Great Recession would be required to substantiate whether the positive relationship held true only during the Great Recession or whether the beginning of the Great Recession marked

a break point in the relationship between workers' compensation insurance costs and THS concentration at which time an ongoing positive relationship was initiated.

Table 7
Summary of Key Results

	w/State and Year Fixed Effects		w/State and Year Fixed Effects and Great Recession	
State Unemployment Insurance Mean Effective Tax Rate	+	0.121***	+	0.086***
State Unemployment Insurance Tax Gradient	+	0.007***	-	0.003**
SUIMETR x Great Recession			+	0.170***
SUIG x Great Recession			+	0.025***
State Workers' Compensation Mean Effective Rate	-	0.027*	-	0.024*
SWCMER x Great Recession			+	0.067***

*** p<0.01, ** p<0.05, * p<0.1

Table 7 shows a summary of key results of the analysis. Because the state and year fixed effects methodology is the most rigorous in controlling for potential endogeneity, and therefore, gets closest to providing causal estimates, the results from the state and year fixed effects approach are used for the summary. The results for the unemployment insurance variables affirm that increases in the average effective tax rate and the tax gradient have the effect of increasing the proportion of THS employment in a state. Taken together, the results indicate that state unemployment insurance policies determining the tax rates and gradient have an influence on the THS concentration in the state. The results for the workers' compensation variable do not conclusively show an impact of workers' compensation average costs on the proportion of THS employment in

the state. The policy implications of these results are discussed in the chapter that follows.

Chapter 6: Policy Implications and Conclusion

The dissertation sought to determine if government policies affect temporary help services employment concentration. State policy factors examined, based on theoretical and empirical indications of a potential impact, were unemployment insurance and workers' compensation. Analysis of state-level temporary help services employment data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages from 1990 to 2011 revealed that state unemployment insurance programs affect THS concentration. More specifically, greater state unemployment insurance tax costs cause employers, in the aggregate, to use a greater proportion of THS workers. A greater unemployment insurance tax gradient has a smaller but statistically significant effect on employers' use of THS workers in place of traditional workers. These outcomes support the theorized hypotheses that increases in the average effective unemployment insurance tax rate or in the unemployment insurance tax gradient cause increases in THS concentration.

Results regarding workers' compensation insurance are less conclusive. The hypothesis that higher workers' compensation costs lead to a greater concentration of THS employment was not clearly supported. Higher average costs of workers' compensation insurance caused employers to use a greater proportion of THS workers during the Great Recession, but had no significant effect over the previous time period. The recession was the deepest and longest of the post-World War II period. The labor market contracted further, and long term unemployment was higher and more persistent, than during previous recessions. The Great Recession may represent a break point in the

relationship between workers' compensation insurance costs and THS concentration, or it may represent an aberration due to exceptional labor market circumstances.

The case for the hypothesized effect of workers' compensation on THS concentration was not as strong as for unemployment insurance. Prior empirical work on the incidence of workers' compensation insurance costs indicated that the costs were largely passed along to employees, which reduces the incentive for employers to seek to avoid the costs of workers' compensation by substituting THS workers for traditional workers. [Gruber and Krueger 1991]Given the weaker case for workers' compensation influence on the proportion of THS employment, the failure to find a relationship between workers' compensation insurance and the proportion of THS employment before the Great Recession, and the exceptional labor market circumstances during the Great Recession, the basis for assertion of a continued relationship post-Great Recession is weak.

The dissertation analysis undertaken does not provide sufficient evidence of a persistent effect of workers' compensation costs on the proportion of THS employment to support the formulation of policy recommendations aimed at attenuating such an effect. If the relationship found during the Great Recession proves to be temporary, then the policy finding would be that policy makers can influence workers' compensation costs without risking the substitution of THS jobs for traditional jobs. If the relationship found during the Great Recession continues, this policy finding would not hold true. Further research is required, once sufficient post-Great Recession data become available, in order to be able to draw definitive conclusions regarding the relationship between workers' compensation insurance costs and the proportion of THS employment.

The results of the analysis of the effects of the average effective unemployment insurance tax rate and the unemployment insurance tax gradient on temporary help services employment concentration, by contrast, proved robust across multiple specifications, thereby providing an evidentiary basis for policy implications and recommendations. The average effective unemployment insurance tax rate was found to have a statistically and economically significant impact on THS employment concentration. The unemployment insurance tax gradient was found to have a statistically significant but economically small effect. The findings held true in specifications that included both state and year fixed effects, which controlled for unobserved variation across states and unobserved variation by year in national economic and labor market conditions. The specification was akin to a differences-in-differences model, which is an established methodology for establishing causal relationships between variables. With the inclusion of fixed effects, the rigorous inclusion of factors theorized or empirically demonstrated to influence THS employment, and the exogeneity of the independent variables of interest, the results of the regression analysis can be considered causal.

The effects of both unemployment insurance tax costs and the unemployment tax gradient on THS concentration were even stronger during the Great Recession. Whether the stronger effects of the average effective unemployment insurance tax rate and the unemployment tax gradient will continue after the Great Recession, or whether the relationships will return to pre-Great Recession levels, is unknown. Further research could be undertaken once adequate data for the post-Great Recession period are available to determine the strength of the relationships. Even without such research, however, policy implications can be drawn as the directions and relative magnitudes of the effects

are consistent. All time periods show an economically and statistically significant positive effect of unemployment insurance tax factors on the proportion of THS employment.

The principal policy implication of these results is that state unemployment insurance contributes, through the effects of its costs on employers, to a higher proportion of temporary help services employment. An increase in the average effective state unemployment insurance tax rate leads to an increase in the concentration of THS employment, which is consistent with an increase in the substitution of THS workers for traditional workers. Conversely, a decrease in the average effective state unemployment insurance tax rate results in a decline in the concentration of THS employment, and that decline is consistent with a reduction in the substitution of THS workers for traditional workers.

The increase in the proportion of THS employment as a result of higher state unemployment insurance tax costs, furthermore, reduces aggregate job quality by fostering the substitution of THS jobs for higher quality traditional direct hire jobs. As discussed in the introductory chapter, according to multiple modes of evaluation, including comparison of job characteristics, qualitative assessment, and analysis of the welfare effects of holding a THS job, temporary help services jobs are found to be of lower quality than traditional jobs. Along the dimensions of compensation, work content, and nature of the employment contract, the job quality of THS employment is lower than that of traditional employment, THS employment generally leads to worse earnings and employment outcomes for low wage workers than traditional employment over the medium to long term.

Job quality is a policy concern because it affects individual, firm level, and national well-being. Higher quality jobs are associated with higher wages. The reduced access of workers with limited educational or occupational skills to good jobs is a contributing factor to rising inequality. [Holzer et al. 2011] Higher job quality can improve employment participation, facilitate innovation, and enable greater productivity at the national level. [Findlay et al 2013] Indeed, due to the benefits of higher job quality to individuals and to national economies, a central tenet of the European Union's economic strategy since 2000 has been the promotion of higher quality jobs. [Holman and McCLelland 2011] Policies that lower job quality have negative effects both on the individuals who hold the lower quality jobs and in the aggregate.

The impact of unemployment insurance tax costs on THS employment and, therefore, job quality is an unintended and heretofore unknown consequence of the state-run unemployment insurance programs. As demonstrated theoretically, higher unemployment insurance taxes could lead to fewer direct hire workers and either higher or lower THS employment, depending upon the marginal rate of substitution of the two forms of labor. Prior scholarship, moreover, suggested that unemployment insurance could induce firms to create more high-wage jobs. [Acemoglu 2001] Higher unemployment insurance average tax costs, however, are now shown to promote employment in temporary help services jobs, which offer lower wages than traditional jobs. This consequence does not imply that unemployment insurance is less effective at providing its intended benefits to the unemployed of supporting consumption and enabling more efficient job choices. It means, however, that the benefits to the unemployed are accompanied by an additional unintended cost to workers. Not only

might the higher costs of labor due to unemployment insurance tax costs lead to a reduction of direct hire jobs, some workers are subject to lower job quality because employers have substituted THS jobs for traditional jobs.

The same results that shed light on the unintended negative consequences for job quality of unemployment insurance also provide a basis for generating recommendations of means to mitigate against those negative consequences. The most obvious means of reducing the impact of state unemployment insurance tax costs on the proportion of temporary help services employment would be to decrease the unemployment insurance tax rate and gradient. Because unemployment insurance is financed by earmarked state unemployment insurance taxes, decreases in the tax rate and gradient would imply a reduction in benefits to the unemployed unless other funding sources were identified. If general state revenues, rather than the unemployment insurance payroll tax, were appropriated for unemployment insurance benefits, the effect of unemployment insurance on THS employment would be reduced. With such a change, however, the responsibility of paying for unemployment insurance benefits would partially shift away from employers and would reduce the disincentive for layoffs.

An approach that has been considered as a means to raise state unemployment insurance tax revenues is increasing the maximum taxable wage base for unemployment insurance taxes. Thirty five states have set their maximum taxable wage base at $15,000 or less. [O'Leary 2013] Raising the maximum taxable wage base, ceteris paribus, would raise the average effective state unemployment insurance tax rate, which was measured as state unemployment insurance tax costs as a fraction of total wages. An increase in the

maximum taxable wage base would, thus, raise revenues and thereby avoid a reduction in benefits paid, but would also cause an increase in THS employment.

Without alternative financing mechanisms, reducing both the unemployment insurance tax rates and gradients would decrease funding for the state unemployment insurance programs, thereby undermining the capability of the programs to provide individual and macroeconomic stabilization benefits. Such an approach, would give rise to a conflict between the policy goals of the unemployment insurance programs and the policy goal of avoiding a decline in job quality associated with increases in temporary help employment concentration due to unemployment insurance tax costs. Given the modest size of the magnitude of the effect of unemployment insurance cost factors on THS concentration, it is hard to justify downsizing state unemployment insurance programs.

An approach that aims for revenue neutrality, thereby preserving state unemployment insurance program benefits while diminishing the impact of state unemployment insurance costs on THS employment, would more judiciously balance the benefits and costs of the state unemployment insurance programs. One means to approach revenue neutrality would be to raise the tax gradient. The results show that an increase in the average effective tax rate has a greater impact on the proportion of THS employment than the tax gradient. Therefore, an increase in the tax gradient designed to reduce the average tax rate and to maintain revenue neutrality could possibly diminish the impact of state unemployment insurance taxes on THS concentration without compromising the unemployment insurance program. Because the results of the dissertation analysis are based on average effects, further study of the proportion of

employers who are charged each rate along the tax gradient would be recommended to more precisely ascertain the effects of rate changes.

The approach of increasing the gradient while reducing the average effective rate could reduce, but would not eliminate, the effect of state unemployment insurance tax factors on THS concentration. It would avoid causing a decline in unemployment insurance program benefits, however. As an added advantage, the increase in rates for those employers with high experience ratings would reduce the cross subsidy of employers who lay off more workers by employers who lay off fewer workers due to imperfect experience rating. An increase in the tax gradient could be accomplished by raising the highest unemployment insurance tax rate – the tax cap – or by increasing the slope of the rates up to and including the highest statutory rate.

States increase unemployment insurance tax rates when their unemployment insurance trust funds become depleted, as they were during the Great Recession. Roughly half the states automatically increase tax rates when trust fund balances fall below a solvency threshold. While a few raise unemployment insurance tax rates through a constant percentage point increase on all employers, most of those with automatic increases raise the rates through a constant percentage increase, which increases the tax gradient. [Vroman and Woodbury 2014] Based on the effects of unemployment insurance taxes on THS concentration and therefore, job quality, in those states where increases are automatic, the latter automatic approach to raising unemployment insurance tax rates through a constant percentage increase should be considered. In those states where unemployment insurance tax rates are raised on a discretionary basis, it is recommended that state policy-makers who must raise revenues to replenish unemployment insurance

trust funds consider increasing the tax gradient rather than imposing across the board tax increases.

Further, state policy-makers could consider amending monetary or nonmonetary standards for qualification for unemployment insurance, and reviewing administrative procedures used to apply the standards, with the goal of increasing THS worker eligibility and recipiency rates. The low THS worker unemployment insurance recipiency rate is theorized to contribute to the effect higher unemployment insurance average effective tax rates have on THS employment concentration. Reductions in the differential in unemployment insurance recipiency rates between THS workers and traditional workers could reduce the effects of unemployment insurance costs on the proportion of THS employment in a state.

At the federal government level, the State Unemployment Tax Act (SUTA) Dumping Prevention Act seeks to prevent employer evasion of state unemployment taxes, including through mechanisms involving temporary help services employers. Even after the passage of the Act, employers have continued to substitute THS employment for traditional employment. In fact, the substitution response to average effective unemployment insurance tax rate increases intensified from the beginning of the Great Recession in 2007. The substitution of THS workers for traditional workers could entirely represent legal tax avoidance. In case it does not, enforcement of the SUTA Dumping Prevention Act on the part of the Department of Labor is recommended. Regarding enforcement of health and safety requirements, the possibility of increasing the responsibility of client employers, rather than allowing delegation of such responsibility to THS agencies, merits analysis. Such an initiative may help address the

concerns with elevated work-related injury risks associated with THS employment that the Department of Labor Occupational Safety and Health Administration has raised.

As well as providing a basis for policy recommendations, the dissertation, more fundamentally, demonstrates that policy factors do affect the proportion of temporary help services employment. The literature on temporary help services employment had identified macroeconomic correlates to THS employment as well as factors affecting the microeconomic decision whether to hire a THS worker in place of a traditional worker. Policy factors – namely, state unemployment insurance tax rates and gradients – are now established as determinant of the proportion of temporary help services workers in the employment pool.

Additional research could provide further insight into the effects of policy factors on THS concentration. The methodological approach followed in the dissertation research of using state panel data required that policies under study vary across states. As a result, federal policies were not considered. Four federal policy factors that that could potentially affect THS employment include the Affordable Care Act of 2010, the Employee Retirement Income Security Act (ERISA), the Fair Labor Standards Act (FLSA) and its amendments, and the reduction in the federal unemployment insurance (FUTA) tax. The employer mandates contained in these Acts could contribute to the proportion of THS employment relative to total employment. The Affordable Care Act, by altering the mandates applicable to both employers and THS agencies for provision of health benefits, may have affected the demand for THS workers. Increased accessibility to health coverage provided independently of employers may, furthermore, have shifted the supply of THS workers. The ERISA private pension regulations that prohibit

discrimination among employees in provision of pension benefits may provide an incentive to use THS workers in place of traditional employees. [Houseman 2001] The level of compliance with the FLSA overtime pay mandate could also have a positive relationship with the proportion of THS employment. Finally, the 2011 reduction of the FUTA tax by 0.2 per cent, so that employers in most cases pay 0.6 per cent instead of 0,8 per cent, also could be analyzed to assess if it had any impact on THS employment.

In addition to research concerning the effects of federal policies on THS employment concentration, further research on the effects of state unemployment insurance and workers' compensation on THS concentration could be undertaken. The dissertation investigated whether and to what degree existing unemployment insurance tax costs have an effect on the proportion of THS workers. Study of the relationships among unemployment insurance benefit policies, THS worker unemployment insurance recipiency rates, and THS concentration could yield further insights. Further research on the hypothesized positive relationship between workers' compensation costs and THS concentration in the post-Great Recession period, after several years have elapsed, would be a logical follow up to the dissertation. Recent general research, moreover, about workers' compensation costs to employers is scarce.[60] Empirical study of how state workers' compensation market structures – public monopoly, private and public, and private only – affect employer costs of workers' compensation could yield valuable evidence for policy-makers.

While the dissertation demonstrated that policies affect job quality by influencing THS concentration, further work to add to the growing literature on the effects of policy

[60] An exception is Thomasen et al 2001, which covers the effects of deregulation on workers' compensation insurance costs in detail.

on job quality could be pursued. Developing a standardized index of job quality would constitute a useful step. Measures of job quality vary within and across disciplines, ranging from pay as a single measure to subjective reports of job satisfaction. [Findlay et al. 2011] Analysis of the effects of federal and state policies on that index could then be undertaken.

Whether measured by wages or by worker reports of job satisfaction, temporary help services jobs are generally of lower quality than traditional jobs. Within occupations, wages are lower in nearly all occupations. Over two-thirds of THS workers would prefer traditional jobs. However, by accepting THS jobs, workers reveal their preference for THS employment over unemployment. Policies that raise the costs of THS employment may reduce the generation of THS jobs, which could reduce employment opportunities. The policy goal is not to discourage THS employment, but to avoid creating incentives to substitute THS employment for traditional, direct hire employment. Policy recommendations to reduce the impact of unemployment insurance taxes on the proportion of THS workers have been suggested, and an agenda for future research on the effects of other policy factors has been set forth. More fundamentally, policy factors can be added to macroeconomic and microeconomic factors known to influence temporary help services employment.

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Appendix I
Temporary Help Services Employment Concentration by State, 1990-2011
(per cent of total employment)

State	Mean	Minimum	Maximum	Standard Deviation
Alabama	1.65	0.55	2.45	0.47
Alaska	0.34	0.25	0.46	0.05
Arizona	1.98	1.12	2.82	0.52
Arkansas	1.81	0.97	2.56	0.35
California	1.88	1.12	2.57	0.40
Colorado	1.64	1.02	2.45	0.35
Connecticut	1.46	0.70	2.06	0.35
Delaware	2.10	1.30	3.88	0.52
Florida	1.82	1.23	2.37	0.33
Georgia	2.15	0.80	2.88	0.58
Hawaii	0.82	0.55	1.26	0.19
Idaho	1.30	0.23	2.06	0.49
Illinois	2.04	1.03	2.70	0.46
Indiana	1.71	0.80	2.63	0.40
Iowa	1.02	0.43	1.79	0.32
Kansas	1.18	0.57	1.59	0.26
Kentucky	1.94	0.84	2.83	0.50
Louisiana	1.35	0.92	1.78	0.21
Maine	0.93	0.61	1.30	0.13
Maryland	1.42	0.82	2.04	0.32
Massachusetts	1.52	0.88	2.11	0.30
Michigan	1.83	0.87	2.81	0.39
Minnesota	1.69	0.97	2.22	0.28
Mississippi	1.23	0.28	1.89	0.40
Missouri	1.42	0.87	1.82	0.23
Montana	0.64	0.18	0.97	0.23
Nebraska	1.00	0.33	1.57	0.31
Nevada	1.50	0.70	2.26	0.38
New Hampshire	1.31	0.81	1.73	0.18
New Jersey	1.57	0.80	2.15	0.35
New Mexico	0.85	0.64	1.08	0.10
New York	1.17	0.85	1.46	0.15
North Carolina	1.75	0.83	2.35	0.35
North Dakota	0.54	0.18	0.91	0.19

State	Mean	Minimum	Maximum	Standard Deviation
Oklahoma	1.60	0.92	2.16	0.33
Oregon	1.95	1.04	2.68	0.41
Pennsylvania	1.19	0.66	1.83	0.28
Rhode Island	1.77	1.39	2.17	0.19
South Carolina	2.24	1.08	2.98	0.50
South Dakota	0.44	0.23	0.66	0.12
Tennessee	2.29	1.13	3.10	0.52
Texas	1.81	1.13	2.23	0.29
Utah	1.49	0.80	2.04	0.31
Vermont	0.69	0.32	1.06	0.17
Virginia	1.50	0.81	2.12	0.32
Washington	1.27	0.78	1.72	0.25
West Virginia	0.74	0.27	1.01	0.18
Wisconsin	1.63	0.89	2.24	0.31
Wyoming	0.59	0.33	0.82	0.13
Total	1.44	0.18	3.88	0.59

Source: Author's calculations, based on data from the BLS QCEW.

Appendix II
Mean Effective Unemployment Insurance Tax Rates by State, 1990-2011
(per cent)

State	Mean	Minimum	Maximum	Standard Deviation
Alabama	0.37	0.28	0.68	0.10
Alaska	1.26	0.87	1.98	0.28
Arizona	0.30	0.17	0.50	0.09
Arkansas	0.71	0.53	1.02	0.11
California	0.59	0.41	0.79	0.12
Colorado	0.39	0.22	0.70	0.12
Connecticut	0.67	0.35	1.03	0.20
Delaware	0.48	0.32	0.70	0.11
Florida	0.35	0.19	0.56	0.10
Georgia	0.33	0.12	0.53	0.13
Hawaii	0.71	0.19	1.23	0.29
Idaho	0.80	0.43	1.53	0.26
Illinois	0.70	0.43	1.08	0.17
Indiana	0.40	0.23	0.66	0.11
Iowa	0.61	0.40	1.12	0.17
Kansas	0.52	0.11	0.81	0.25
Kentucky	0.58	0.40	0.67	0.07
Louisiana	0.41	0.24	0.75	0.14
Maine	0.73	0.41	1.12	0.22
Maryland	0.49	0.27	0.92	0.21
Massachusetts	0.89	0.55	1.32	0.23
Michigan	0.86	0.58	1.19	0.18
Minnesota	0.58	0.35	0.84	0.14
Mississippi	0.44	0.24	0.72	0.14
Missouri	0.48	0.28	0.77	0.12
Montana	0.73	0.52	0.98	0.12
Nebraska	0.32	0.11	0.64	0.14
Nevada	0.68	0.48	0.87	0.09
New Hampshire	0.31	0.16	0.73	0.17
New Jersey	0.74	0.42	1.04	0.13
New Mexico	0.49	0.32	0.66	0.11
New York	0.56	0.39	0.83	0.13
North Carolina	0.45	0.08	0.74	0.19
North Dakota	0.50	0.34	0.63	0.08

State	Mean	Minimum	Maximum	Standard Deviation
Oklahoma	0.38	0.12	0.77	0.18
Oregon	1.06	0.68	1.37	0.20
Pennsylvania	0.91	0.72	1.34	0.18
Rhode Island	1.15	0.81	1.57	0.26
South Carolina	0.46	0.32	0.75	0.10
South Dakota	0.20	0.15	0.54	0.09
Tennessee	0.46	0.33	0.65	0.10
Texas	0.42	0.23	0.58	0.10
Utah	0.41	0.20	0.68	0.15
Vermont	0.63	0.42	0.93	0.15
Virginia	0.26	0.12	0.40	0.09
Washington	0.99	0.64	1.33	0.15
West Virginia	0.74	0.57	0.90	0.10
Wisconsin	0.66	0.50	1.04	0.13
Wyoming	0.61	0.30	1.15	0.22
Total	0.59	0.08	1.98	0.28

Source: Author's calculations, based on data from DOLETA

Appendix III
Mean Unemployment Insurance Tax Gradients by State, 1990-2011
(percentage points)

State	Mean	Minimum	Maximum	Standard Deviation
Alabama	5.46	4.96	6.15	0.36
Alaska	4.32	3.64	4.40	0.18
Arizona	5.33	4.90	5.88	0.21
Arkansas	6.90	5.90	9.90	1.69
California	4.53	3.90	5.30	0.41
Colorado	5.30	4.40	5.40	0.22
Connecticut	4.90	4.90	4.90	0.00
Delaware	7.73	1.40	8.50	1.43
Florida	5.20	4.37	5.40	0.21
Georgia	6.46	2.36	8.58	1.61
Hawaii	5.05	2.20	5.40	0.78
Idaho	4.96	2.20	5.84	0.76
Illinois	6.72	4.40	8.60	0.89
Indiana	5.24	4.50	8.80	0.85
Iowa	7.66	7.00	9.00	0.57
Kansas	6.85	5.96	7.40	0.57
Kentucky	8.92	8.70	9.70	0.29
Louisiana	5.89	5.26	6.25	0.30
Maine	4.99	4.10	7.09	0.65
Maryland	7.35	5.30	11.30	1.46
Massachusetts	7.33	4.20	11.01	2.32
Michigan	9.38	8.00	10.24	0.78
Minnesota	9.01	7.10	10.32	0.71
Mississippi	4.8	4.20	5.30	0.28
Missouri	7.13	5.58	9.75	1.35
Montana	6.04	4.30	6.40	0.59
Nebraska	5.65	4.90	8.66	0.99
Nevada	5.05	2.90	5.15	0.47
New Hampshire	6.49	6.00	6.99	0.19
New Jersey	5.15	5.00	5.30	0.11
New Mexico	5.18	4.80	5.39	0.23
New York	6.64	4.50	8.40	1.60
North Carolina	5.92	5.40	6.84	0.45
North Dakota	7.50	5.00	9.80	2.18

State	Mean	Minimum	Maximum	Standard Deviation
Oklahoma	5.93	5.40	8.10	0.94
Oregon	4.27	3.20	5.26	0.48
Pennsylvania	8.44	7.58	11.32	1.04
Rhode Island	7.35	5.90	8.10	0.99
South Carolina	4.77	1.40	11.18	1.59
South Dakota	7.55	7.00	9.50	0.73
Tennessee	9.81	9.50	10.00	0.17
Texas	6.39	3.57	8.40	1.10
Utah	8.21	7.40	9.00	0.62
Vermont	5.54	5.00	7.10	0.55
Virginia	6.02	5.40	6.20	0.23
Washington	5.13	4.83	6.03	0.34
West Virginia	6.34	6.00	8.00	0.55
Wisconsin	9.51	8.50	9.75	0.39
Wyoming	8.40	5.95	9.44	0.76
Total	6.45	1.40	11.32	1.72

Source: Author's calculations, based on data from DOLETA

Appendix IV
Mean Workers' Compensation Costs by State, 1990-2011
(per cent of total wages)

State	Mean	Minimum	Maximum	Standard Deviation
Alabama	1.34	1.18	1.47	0.10
Alaska	2.93	2.13	3.62	0.51
Arizona	0.92	0.82	1.08	0.08
Arkansas	1.06	0.78	1.25	0.17
California	2.29	1.62	3.43	0.67
Colorado	1.29	0.86	1.57	0.23
Connecticut	1.14	0.99	1.30	0.10
Delaware	1.51	1.11	2.09	0.34
Florida	1.69	1.09	2.12	0.38
Georgia	1.23	1.09	1.42	0.12
Hawaii	2.08	1.41	2.63	0.48
Idaho	1.79	1.49	2.13	0.22
Illinois	1.41	1.21	1.50	0.08
Indiana	0.92	0.77	1.04	0.09
Iowa	1.47	1.26	1.57	0.08
Kansas	1.30	1.18	1.42	0.08
Kentucky	1.52	1.23	1.77	0.17
Louisiana	1.73	1.53	2.00	0.16
Maine	1.84	1.48	2.05	0.22
Maryland	1.14	0.96	1.30	0.11
Massachusetts	0.83	0.64	1.05	0.13
Michigan	1.18	0.98	1.33	0.11
Minnesota	1.15	1.03	1.25	0.08
Mississippi	1.52	1.31	1.73	0.13
Missouri	1.41	1.08	1.66	0.22
Montana	2.70	1.46	3.50	0.68
Nebraska	1.49	1.31	1.69	0.12
Nevada	1.35	1.00	1.56	0.20
New Hampshire	1.39	1.13	1.57	0.15
New Jersey	1.24	1.02	1.35	0.11
New Mexico	1.45	1.10	1.75	0.18
New York	1.17	1.03	1.28	0.07
North Carolina	1.30	1.12	1.48	0.13
North Dakota	1.40	1.28	1.53	0.08

State	Mean	Minimum	Maximum	Standard Deviation
Oklahoma	1.92	1.46	2.14	0.23
Oregon	1.33	1.10	1.66	0.17
Pennsylvania	1.62	1.47	1.80	0.11
Rhode Island	1.28	1.01	1.49	0.17
South Carolina	1.80	1.34	2.16	0.26
South Dakota	1.43	1.24	1.65	0.15
Tennessee	1.33	1.07	1.55	0.17
Texas	1.04	0.67	1.32	0.22
Utah	1.15	0.83	1.44	0.23
Vermont	1.98	1.63	2.37	0.27
Virginia	0.84	0.71	1.00	0.09
Washington	1.61	1.29	2.09	0.29
West Virginia	3.77	1.96	6.46	1.05
Wisconsin	1.80	1.63	1.91	0.08
Wyoming	2.13	1.60	2.49	0.28
Total	1.53	0.64	6.46	0.60

Source: Author's calculations, based on data from A.M. Best and NASI