BARRIERS TO RETRAINING: THE IMPACT OF OCCUPATIONAL LICENSING UPON
THE TRADE ADJUSTMENT ASSISTANCE PROGRAM

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ABSTRACT

There has been research done into the outcomes of the Trade Adjustment Assistance (TAA)

program, as well as research done on the impact of occupational licensing requirements, but

there has been little examination of the interaction between the two policies. This paper adds to

the existing TAA and occupational licensing literature by seeking to understand the causes of the

limited success of the TAA program, by examining the impact of occupational licensing on

program outcomes.

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The research and writing of this thesis

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I.   INTRODUCTION

I investigate in this paper the relationship between prevalence of occupational licensing laws and the success of worker retraining programs in each state. I examine national data from the Trade Adjustment Assistance program, broken down by state, in order to see discrepancies in the success of the program state-by-state. I also look at data measuring the different types of state-imposed barriers that are required in order to obtain a license in some of the most popular professions that the TAA program provides training for. These data will allow an examination of whether strongly protective job licensing requirements have an impact upon workers' ability to start a new career and their earnings after entering their new career. My hypothesis is that burdensome occupational licensing requirements will negatively impact the success of the TAA program.

In our increasingly globalized economy, economists and policymakers frequently grapple with the problem of worker retraining. Most worker training programs seek to help those trying to enter the workforce for the first time; however, worker retraining is distinct from these programs by nature of its emphasis on transitioning older workers who have previously had an established career. In previous generations, workers often worked in the same industry for their entire life; but today, the fast pace of technology and globalization have led to increasing specialization and efficiencies in many industries. Specialization and efficiency are beneficial to the world at large, but they also have the potential to have a harmful impact upon the lives and livelihoods of small, specific workers and communities. There are gains to opening trade, but trade also disrupts existing industries and can cause worker displacement in the short term. Sources project that by 2030, anywhere from 75 to 375 million workers may need to leave their

current jobs and seek out new careers.[1] Countries want to benefit from the gains from trade and gains from technology, but do not want to leave workers behind. As such, policymakers have increasingly looked to vocational training and specifically vocational re-training as a potential solution.

Unfortunately, many of the occupational re-training programs that policymakers have designed have been less successful than was hoped. In this thesis, I examine one program in particular, the Trade Adjustment Assistance (TAA) program, which offers workers displaced by free trade job training to enter a new career. A 2012 evaluation by Mathematica requested by the Department of Labor found that TAA is ineffective in raising the wages of participants, and an earlier study also found that participating in TAA training had no effect on raising the earnings of participants.[2] There are many explanations given for the lack of success of these programs, and many factors are not within the control of the government. However, if there are measures that the government can take in order to lower barriers to re-entry for these displaced workers, we should examine them.

One potential such barrier that has not yet been examined has been the impact of occupational licensing regimes upon the effectiveness of worker retraining programs. Occupational licensing programs require that workers must complete some sort of training or exam in order to be able to work in a particular job. Though officially put in place for health and safety reasons, many critics claim that licensing mostly serves to protect those who already have licenses from competition by further restricting entry into the occupation. Additionally,

[1] https://www.mckinsey.com/featured-insights/future-of-work/jobs-lost-jobs-gained-what-the-future-of-work-will-mean-for-jobs-skills-and-wages.
[2] https://www.mathematica.org/our-publications-and-findings/projects/trade-adjustment-assistance-evaluation

occupational licensing requirements vary widely by state, making them ideal for study in a cross-sectional regression.

The paper proceeds as follows: in the next section, I provide background and a review of the related literature. In Section III, I develop a theoretical framework, and create a model that incorporates the factors that I believe should in theory influence the success of the TAA worker retraining program. In Section IV, I summarize the data and descriptive statistics that I use to perform my regressions. In Section V, I review the results of the regression, and finally in Section VI, I detail the policy conclusions that I have drawn from said results.

II. BACKGROUND AND LITERATURE REVIEW

In this chapter, I will provide a background on both the TAA program and occupational licensing requirements, and will discuss the literature involving the effectiveness of TAA and the burden of occupational licensing in certain professions.

1. Origins of the Trade Adjustment Assistance Program

When considerations of national policy make it desirable to avoid higher tariffs, those injured by that competition should not be required to bear the full brunt of the impact. Rather, the burden of economic adjustment should be borne in part by the Federal Government... But the accent is on "adjustment" more than "assistance". Through trade adjustment prompt and effective help can be given to those suffering genuine hardship in adjusting to import competition, moving men and resources of uneconomic production into efficient production and competitive positions...

—John F. Kennedy, Congressional address on the 1962 Trade Expansion Act (cited by Kondo (2013))

Economists widely agree that reducing barriers to international trade offers significant economy-wide benefits. The overall increase in economic efficiency, a larger variety of consumer goods, and lower prices for producers and consumers are all desired outcomes of freer trade, and economists often encourage public policy goals that will liberalize trade in order to continue to produce these positive outcomes. However, though it is widely agreed-upon that free trade has strong positive overall economic effects, it is also true that freer trade is not without its costs, including most notably job loss for workers whose employer may be facing reduced demand due to competition from foreign imports.

The Trade Adjustment Assistance (TAA) program was designed in order to provide assistance to these trade-affected workers who were facing job loss due to trade liberalization. TAA is formally categorized as a dislocated worker program, administered by the Employee Training Administration (ETA) through the United States Department of Labor (DOL). The intention of the program is to provide income support, job training, and other benefits for workers who lose their job due to the impacts of international trade.

Program History

The first TAA programs were created in 1962 under President Kennedy, with the goal of providing financial benefits to workers hurt by trade and therefore changing the political calculus behind free trade agreements (FTAs). The early TAA programs were initially rarely used, but exploded in popularity when the Trade Act of 1974 loosened eligibility requirements. In the period between 1975-1980, the number of certified workers participating in the program increased from 59,000 to 600,000.[3] In order to combat the rapidly-increasing costs of TAA, Congress scaled back program benefits in the Omnibus Budget Reconciliation Act of 1981, and shifted the program to increasingly focus on worker training and other reemployment services. In 1988, the Omnibus Trade and Competitiveness Act of 1988 made worker training a program requirement for the first time.

In 1993, there was a movement to tie TAA benefits and training to trade deals, and the 1993 North America Free Trade Agreement (NAFTA) negotiations included a provision that created dedicated expanded TAA benefits for specifically those workers who saw job losses due

[3] Congressional Research Service, Trade Adjustment Assistance for Workers and the TAA Reauthorization Act of 2015.

to increased trade with Canada or Mexico. However, this change was short-lived - in 2002, Congress moved away from the idea of tying free trade agreements (FTAs) to TAA assistance. The Trade Act of 2002 (among several other trade-related provisions) merged the separate NAFTA-TAA program back into the overall TAA program, and also created a Health Insurance Tax Credit for TAA workers that still exists in today's TAA.

In 2009, further changes were made to expand the scope of the program in light of the harm caused by the Great Recession. TAA reauthorization was included in the American Recovery and Reinvestment Act (ARRA), which was a law designed to stimulate the economy post-recession. The 2009 reauthorization of TAA created several important program expansions – it increased funding for training, increased the duration of TRA financial assistance payments, and broadened the eligibility requirements to participate in the program. In 2011, the Trade Adjustment Assistance Extension Act (TAAEA) reauthorized the TAA program, continuing the expanded service sector eligibility and level of training benefits found in ARRA.

The most recent reauthorization of TAA was through the Trade Adjustment Assistance Reauthorization Act of 2015 (TAARA), which combined TPA (Trade Promotion Authority) and TAA reauthorization. TAARA kept the expanded service sector eligibility provisions and maintained a slightly-decreased level of training funding. TAARA is current law, but is scheduled to sunset in July 2021. At this time the TAA program will revert to a more limited set of eligibility and benefit levels. Without further reauthorization, the program will expire July 2022, and will phase out after that date.

Current Eligibility and Benefits

Under current law, in order to obtain TAA benefits, a group of workers or their firm must first file a petition with the DOL. The Division of Trade Adjustment Assistance then investigates the case and decides whether the job loss was attributable to foreign trade. This may be evidenced by a shift in production to a foreign country, an increase in competitive imports, or rising aggregate US imports. If the DOL finds that there is indeed evidence that the workers in question lost their job due to increased trade, the petition is certified, and the DOL will determine an impact date on which trade-related layoffs began. A certified petition will give TAA eligibility to all workers at the firm associated with the petitioners who were laid off at any time between the impact date and two years after the certification of the petition.

Once the petition is certified, the individual eligible workers must then apply for state-administered benefits at local American Job Centers (AJCs). These benefits include training and reemployment services, income support for workers who have exhausted their unemployment benefits, and under certain conditions, a tax credit to pay for a portion of their health insurance premiums. In order to be eligible for these benefits, workers must meet a set of eligibility criteria and must be enrolled in an approved training program or have received a waiver from training.[4] If a worker is over age 50, they may instead apply for the Reemployment TAA (RTAA) program, a wage insurance program that supplements 50 percent of the difference between the pre-layoff wage rate and the wage rate in the new job, up to $10,000 a year for two years. To

[4] Congressional Research Service, Trade Adjustment Assistance for Workers and the TAA Reauthorization Act of 2015.

qualify, a worker must be either employed full-time or be enrolled in a TAA-sponsored training program while employed at least 20 hours per week.[5]

The TAA program confers diverse benefits, including case management and employment services, job search and relocation allowances, trade readjustment allowance (TRA), and a health care tax credit. However, the purpose of the program centers around its job training services. The main purpose of TAA continues to be connecting workers with appropriate and useful training. The statute specifies that a request for training assistance shall be approved if there is no suitable employment available for the displaced worker, if the worker would benefit from the training, if there is a reasonable expectation of employment following such training, if training is reasonably available to the worker through either government or private sources, and if the training is suitable for the workers and available at a reasonable cost.

Once approved, training can be paid on a worker's behalf to the service provider or through a voucher system to a private provider. Though there is no federal limit on the amount of training an individual can receive, some states impose separate caps, another factor which may be affected by the prevalence of occupational licensing requirements in a state. TAA permits a wide variety of training programs, but in 2015 about 88 percent of TAA participants received "occupational skills training" – training in a specific occupation, provided in a classroom setting. Among the 2018 program participants who successfully completed their training programs, the average duration of enrollment in the program was 473 days, average duration of TAA training was 330 days, and the average training cost was $13,734.[6] Though TAA does not require training

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[5] Congressional Research Service, Trade Adjustment Assistance for Workers (TAA).
[6] https://www.doleta.gov/tradeact/docs/AnnualReport18.pdf.

programs to lead to a degree or credential, in FY2018, over 89 percent of those who completed training received a credential.[7]

TAA is certainly impacted by occupational licensing – the AJC national website, careeronestop.org, has a specific "License Finder", which helps TAA participants look into whether their chosen career will require a license in order to practice. However, extensive studies have not been performed on the impact of these licensing requirements upon the cost or outcomes of the TAA program, even though licensed professions have been rapidly growing in recent years. The following section explains more about the rise of occupational licensing, and why this phenomenon is important to understand when examining the outcomes of the TAA program for workers.

2. The Rise of Occupational Licensing

Occupational licensing is one of the most pervasive and growing areas of state-level labor market regulation today. Over the past 60 years, the regulation of occupations has expanded dramatically, with the percentage of the workforce requiring a license to practice their jobs increasing from 4.5 percent in the 1950's, to about 20 percent as of the 2000 census.[8] Additionally, as our economy shifts to be more service-driven, the number of jobs that require licensure is expected to grow.

State regulation of the ability to practice an occupation generally takes three main forms – registration, certification, and licensure. Registration, the least restrictive of the three, asks that an individual register with the government before practicing their profession. Certification is

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[7] https://www.doleta.gov/tradeact/docs/AnnualReport18.pdf.
[8] Kleiner 2006.

more burdensome, with the government or a licensure board administering an examination that certifies that those who pass have attained a certain "certified" status and conferred credibility. Though the government certification limits access to certified status, it still permits those without a certification to practice the profession. Most restrictive of all is state-required licensure, which makes it illegal to practice a licensed profession without state-granted permission, which often comes at a high cost of both time and money.

The establishment of the state's authority over occupational licensing goes back to the 1888 Supreme Court Case *Dent v West Virginia,*[9] in which a unanimous Supreme Court noted that each citizen has a right to follow any lawful calling, but additionally that this right could be subject to "reasonable" state restrictions. Licensing was then seen as a way for the state to give a guarantee of minimum quality at a time in which occupational standards were lax, and information on quality of businesses was hard to find outside of word of mouth. This was seen as particularly important in healthcare, a field in which public understanding was low and stakes were high.

Though occupational licensing started as a commitment to the public interest, it quickly gained popularity for different reasons. Members of occupations found that licensing not only increased the public's trust in their service (and thus increased their willingness to pay), but that it also had the effect of simultaneously restricting competitors from entering the market, further bolstering their ability to raise prices. Governments have also warmed to the idea of occupational licensing as a way to appear responsive to public health and safety, while also raising revenue

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[9] *Dent v State of West Virginia* - "The nature and extent of the qualifications required must depend primarily upon the judgment of the state as to their necessity. If they are appropriate to the calling or profession, and attainable by reasonable study or application, no objection to their validity can be raised because of their stringency or difficulty."

from the fees required for licensure. Licensure has large concentrated benefits for those in the licensed profession, but has dispersed costs for consumers, making it an easy way for politicians to appease small but vocal constituencies without facing strong repercussions from the rest of their constituents.

Though politically popular, licensing requirements can have large costs for workers, especially those seeking to enter a new field such as TAA participants. Though jobs with restricted entry likely see higher wages, they also are much more difficult to enter due to the licensing board's control over entry requirements. Many studies have confirmed that licensing reduces employment growth, and Morris (2006) finds that for occupations licensed in some U.S. states and not others, employment growth was 20 percent higher in unregulated states than it was in regulated ones from 1990 to 2000.[10]

These types of findings have clear potential implications for the success of job-training initiatives. Higher barriers to entry may preclude the success of TAA participants seeking employment in a licensed field, or may even dissuade the TAA participant from entering the field in the first place. Alternatively, the greater stability of a licensed job and the higher wages associated with higher licensing requirements may draw TAA participants into working in the licensed fields over non-licensed ones. This thesis will examine what impact state-level licensing requirements have upon the success of the TAA program from state to state and will consider the relevant literature when crafting a model.

[10] Morris 2006.

3. Related Literature

While this thesis is one of the first examinations of the relationship between the burden of occupational licensing and the success of the Trade Adjustment Assistance program, it builds upon a significant literature studying both the outcomes of the TAA program as well as the impact of occupational licensing.

Trade Adjustment Assistance

One of the earlier studies looking into the impact of the TAA program was Staiger and Fung's 1994 National Bureau of Economic Research (NBER) study examining the relationship between trade adjustment subsidies and trade liberalization.[11] The study had the important finding that trade adjustment policies serve as an incentive for trade liberalization, serving as a "bribe" for mutually cooperative behavior between countries and labor stakeholders. If policymakers seek to overcome populist opposition to trade liberalization, it seems that supporting TAA is a viable way to gain some support in their favor.

However, before doing so, policymakers must ensure that the TAA program is a viable program that achieves its desired outcomes and is a good use of taxpayer money. Multiple studies have examined the impact of TAA upon worker outcomes, but unfortunately, most of the research finds that the program is not as successful as it could be. Perhaps the most-referenced study in relation to the success of the TAA program is the 2012 Mathematica Policy Research study commissioned by the Department of Labor. The study found that TAA participants earned on-average $3,300 less than non-TAA participants, and worked only 33 weeks per year as

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[11] Staiger 1994.

compared to 35 weeks.[12] The study notes that this may have been attributable to the weak job market at the time – the period examined in the study was from 2004 to 2011 and included the Great Recession, which has a high likelihood of negatively skewing the results. Regardless, the Mathematica study remains the most comprehensive study to date on the effectiveness of the TAA program.

Other studies on the success of the TAA program have found similarly underwhelming results. Hyman's 2018 study examines the success of the TAA program, studying 20 years of worker-level earnings. He finds that though TAA program provides greater earnings in the short-term, driven by higher incomes and labor force participation, these increased earnings depreciate over the same period. [13] Additionally, another study conducted by Park in 2011 looked at whether occupational training provided by the TAA program has a positive effect upon wage-replacement rates, post-participation earnings, and retention rates. Park found that occupational choices matter - that the TAA program's success would be increased if more resources were allocated to ensuring a good participant match with a profession that was a good fit for their abilities and was in high demand in the surrounding region.[14] Finally, an additional study by Jang (2011) study looks at how TAA for workers plays a role in intra-sectoral redistribution of labor in response to trade policy, finding that there are significant barriers in place for TAA participants who seek to move to a different industry, especially in the service sectors – sectors that happens to be heavily-licensed.[15]

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[12] Mathematica 2012.
[13] Hyman 2018.
[14] Park 2011.
[15] Jang 2011.

A second subcategory of TAA studies examines the impact of the TAA program in increasing the political viability of free trade. Economists largely agree that globalization and international trade is a net benefit to the welfare of nations – the General Agreement on Tariffs and Trade (GATT) and the creation of the World Trade Organization (WTO) have contributed enormously to both international and domestic economic growth, as well as to overall welfare. However, as Meyer (2017) notes, politicians make laws, not economists, and in politics there has been an ever-present strain of thinking that international trade is a primary cause of economic inequality.[16] Despite much economic evidence to the contrary, this viewpoint has persisted and grown stronger in recent years, and therefore economists have looked to the TAA as a possible way to push back against these criticisms and assuage ongoing concerns. Lake's 2014 study examines how TAA impacts the political viability of free trade and finds that a one standard deviation increase in TAA redistribution leads to more than a 3 percentage point increase in the probability of voting in favor of a free trade agreement (FTA) for the median representative.[17] He also finds that, under his model, a one standard deviation decrease in TAA redistribution would have stopped the passage of 2 of the 11 FTAs in their sample.

Additionally, Kim & Pelc (2019) recently released a study examining whether the TAA program is adequately responsive to the worker displacement that is a result of trade liberalization. Though they found that TAA is between 1.7 and 3.3 times more responsive than other studies suggests, they also find that the responsiveness of TAA has decreased since 1990, indicating that there could be room for improvement of the TAA program outcomes. [18]

[16] Meyer 2017.
[17] Lake 2014.
[18] Kim & Pelc 2019.

The renewed interest over the last four years in this second category of study is likely due to the to the recent increase in threats and implementation of protectionism from Washington, D.C. Though the nature of the TAA program is such that eligibility can only result from practices that expand trade (workers who lose their jobs as a result of tariffs or other trade-restricting decisions are not eligible), supporters of trade liberalization are looking at the TAA program as a possible response to the increasing accusations coming from both Democrats and Republicans of trade harming workers and causing job losses.

My paper adds to the existing TAA literature by seeking to delve into the causes of this restricted success of the TAA program, by examining one issue that is 1) within the control of policymakers, and 2) may have considerable impact upon the success of the TAA program – the presence and burden of state-level occupational licensing programs.

Occupational Licensing

The background literature on the state-level impacts of occupational licensing is far more limited. Though several organizations have done an excellent job compiling data about licensing in each state and its relative burden, there are few studies that directly examine how licensing discourages workers from entering the job market.

There has, however, been research as to licensing's impact upon consumers, and upon the job security and wages of those being licensed. One of the best studies into the impact of occupational licensing upon consumers is Kleiner's 2000 study of whether licensing of dentistry improves the quality of services provided to consumers and whether it improves the earnings of practitioners. The study found that stricter dental licensing does not improve quality, but that it

does raise prices and the earnings of practitioners.[19] Though this is an important finding for policymakers, the study does not directly examine the impact of licensing and the subsequent higher earnings upon the interest and incentives of job-searchers seeking to enter the field.

A more recent study by Kleiner & Soltas (2019) examines the overall welfare impact of occupational licensing, and looks at how workers respond to the incentives and opportunity costs associated with licensing laws. They find that for workers in licensed professions, higher wages make up for only about 60 percent of the opportunity cost associated with entering a licensed profession.[20]

Overall, my paper seeks to add to this research by examining how state-level occupational licenses impact the success of the TAA program. My study will look at state-by-state TAA outcomes and compare them with the state's relative licensing burden for professions that TAA participants often seek to enter.

[19] Kleiner 2000.
[20] Kleiner & Soltas, 2019.

III. THEORETICAL FRAMEWORK

In order to examine whether and how state-level occupational licensing requirements impact the success of the TAA program, I developed the theoretical model described below. This model discusses the factors that I believe should in theory influence the success of the TAA worker retraining program. It is with the below theoretical model in mind that I developed my empirical model.

$$\textit{Measure of TAA Retraining Success} = f(\textit{Days Required for Training, Examination Requirements, Overall Licensure Burden, D, u}) \tag{1}$$

This model was developed under the theory that retraining prospects and subsequent success in finding comparably-paying employment are likely related to the difficulty of achieving the required credentials in order to perform a job. Cost is usually a significant burden of occupational licensing; however, I omitted this variable from the regressions, because the TAA program usually covers all or much of the costs associated with training. However, the hours required for training and the number of examinations required for licensure may still impact an individual's success in the TAA retraining program – a higher bar for training, by design, leads to fewer entrants and fewer successful completers. While I did not have sufficient data to examine whether the licensing requirements had a *discouraging* effect (i.e., preventing TAA participants from seeking training in certain types of careers in the first place), I did examine whether a high bar for licensure led to more participants spending time in training, and whether it impacted wages following the TAA-provided training program.

My theoretical model suggests that a high training requirement will lead to more participants spending more time in training programs, and therefore more students enrolled in the training portion of the program. It also suggests that burdensome licensing requirements harm the ability of participants to successfully complete the TAA training program and subsequently find new employment, and therefore, a state with consistently high licensure requirements for common retraining professions will demonstrate a lower rate of success in the TAA program.

I also examined whether the burdens of licensure have an impact upon the earnings of TAA graduates. I identified two potential effects, in differing directions. Firstly, high training and exam burdens could discourage workers from pursuing training in high-wage careers, or prevent them from finding employment in high-wage careers, meaning that higher requirements would lead to wage depression. Alternatively, one could posit that high training and exam requirements could serve as a barrier to entry, meaning that licensure would be used to keep competition down and therefore keep wages high.

My theoretical model suggests a mix of the two effects. Though licensed professions may command higher wages, I project that high licensure requirements in a state will discourage or prevent TAA participants from entering heavily licensed professions, leading to a negative impact upon wages as a whole. So, a heavily-licensed state's average wages of TAA program participants should be lower than the average wages of TAA program participants in a mildly-licensed state.

IV. DATA AND DESCRIPTIVE STATISTICS

The data come from three primary sources: the U.S. Department of Labor, the National Conference of State Legislatures, and the Institute for Justice. Table 1 below gives the descriptive statistics for the dataset:

Table 1: Descriptive Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
FundAllocation	357	7.903e+06	9.483e+06	0	6.437e+07
TotalTAAParticip	356	1,260	1,809	0	15,878
TotalTrainParticip	356	604.6	762.0	0	6,402
FinalDayTrain	356	328.9	441.3	0	4,297
TotalExiters	356	530.2	745.8	0	6,951
EnteredEmplyRate	354	0.720	0.151	0	1
EmplyRetainRate	353	0.853	0.151	0	1
moAvgEarn	352	15,147	5,405	0	38,115
TotalDaysLost	51	9,488	4,237	2,956	17,729
TotalExams	51	28.24	6.144	18	40
UnemploymentRate	51	5.071	1.070	2.900	7.600
EmplPopManufacturing	51	9.802	4.027	1.300	18.90
MeanHouseholdIncome	51	81,659	14,026	59,557	121,095

1. Trade Adjustment Assistance Data

The Department of Labor (DOL) is a federal agency responsible for overseeing issues of occupational safety, work training, and reemployment statistics. Part of the Department's responsibilities include running the Trade Adjustment Assistance program, and the Trade Act of 1974 requires the DOL to collect and publish specified data on TAA participation, benefits, outcomes, and spending.[21] These data are first collected at the state level by agencies that

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[21] CRS, Trade Adjustment Assistance for Workers and the TAA Reauthorization Act of 2015.

administer the program, and are then submitted to the federal Department of Labor for compilation and publication.

For my analysis, I use these annual data collected by the DOL to measure various aspects of the TAA program, including the number of TAA "exiters" (participants who successfully complete the program and no longer need TAA services) who completed training during participation, the total funding allocated to each state, the number of the number of new and current TAA participants, the rate of entering employment, the rate of retaining employment, the monthly average earnings of TAA exiters, and more. My dataset includes these data from the years 2012-2018.

2. **Occupational Licensing Data**

The occupational licensing data come from the Institute for Justice and the National Conference of State Legislatures, each of which provide helpful data on certain occupations and their differing licensing requirements in each state.

My first source, the Institute for Justice (IJ), is a non-profit public interest law firm that litigates cases and conducts strategic research on areas related to economic mobility and liberty.[22] One of their biggest areas of involvement is with cases of occupational licensing, and they consequently have twice published a study called "License to Work", which provides a comprehensive look at licensing burdens for lower-income occupations across the United States. IJ's research focuses on the impact of licensing requirements upon relatively lower-income occupations, so my report used IJ's data on occupations in the fields that TAA recipients are

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[22] "About Us", Institute for Justice.

likely to go in to (according to TAA reports[23]), such as services, retail trade, and health care and social assistance.

The other source of data is from the National Conference of State Legislatures (NCSL), a bipartisan non-governmental organization that provides data useful for the members and staff of state legislatures across the country. NCLS conducts policy research in a large range of areas relevant to state policy, one of which is the impact of occupational licensing laws. They created a database that lists a range of commonly-licensed professions and the training requirements needed for licensure in each state, of which some of this study's data was pulled from.

As NCSL's research does not focus only on low-income professions, I used their database for licensing information on higher-income occupations that TAA participants often sought to enter, such as certified nursing assistant, licensed practical nursing, and electrician. Both NCSL's and IJ's research allowed me to collect data on the state licensing requirements for fields that TAA graduates frequently go into.

Finally, the Current Population Survey (CPS) from the Bureau of Labor Statistics (BLS) provides data that complement the previous two categories. This study incorporates the CPS's ranking of each state's licensure rate among employed workers as one factor contributing to our measuring of how burdensome each state's licensing requirements are. It also includes BLS data on "control" metrics – including median household income, unemployment rate, population employment in manufacturing, and more. These variables were added in order to account for overall statewide trends in the job market that might have otherwise biased the results of the regression.

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[23] "Trade Adjustment Assistance for Workers Program FY2018 Annual Report." U.S. Department of Labor, 2019.

3. **Data Modifications**

In order to make the data usable for our purposes, I made a number of changes outlined below.

First, I combined the exam requirements and days lost in the year 2017 across professions for each state, to create two new variables – TotalExams, and TotalDaysLost. TotalExams measures the total number of exams across the 18 examined professions that each state requires. TotalDaysLost measures the total number of days lost across the 18 examined professions that each state requires. Both of these variables are intended to give a summary look at each state's overall licensure burden, instead of examining each singular profession. Figure 1 shows how widely states vary in total days lost. More details regarding calculation of these summary variables are in Section IV.
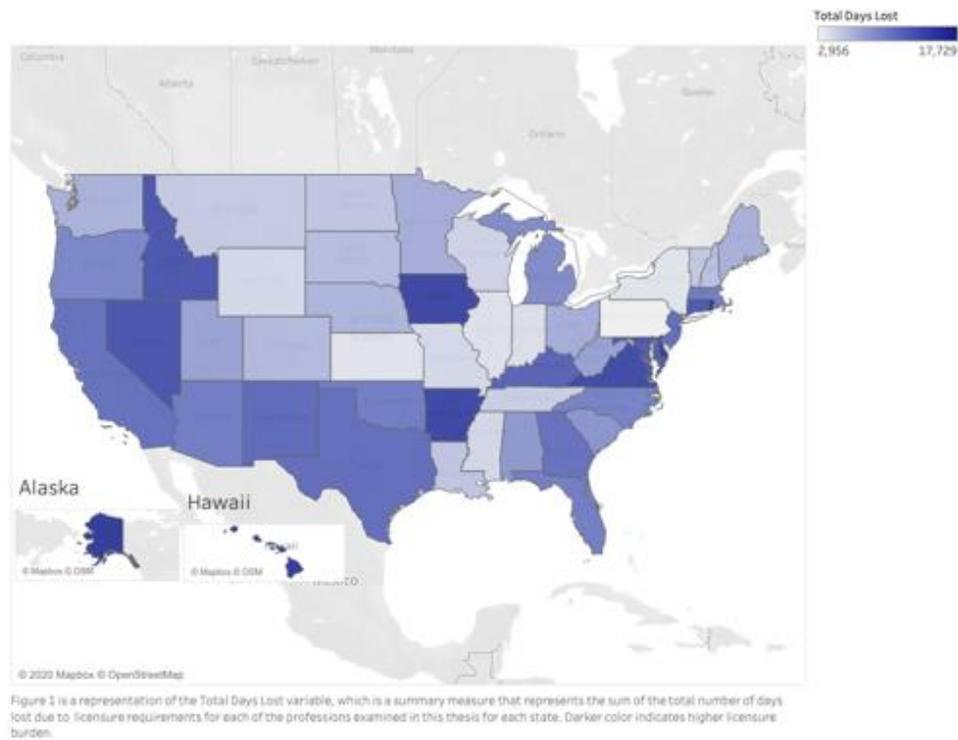

Figure 1 is a representation of the Total Days Lost variable, which is a summary measure that represents the sum of the total number of days lost due to licensure requirements for each of the professions examined in this thesis for each state. Darker color indicates higher licensure burden.

Figure 1: Total Days Required for Licensure by State, 2017

The biggest challenge with the occupational licensing data was converting all of the training requirements into a single metric. Different states have different education and experience requirements - some state statutes list their licensure training requirements in the metric of hours, while others use days, months, or years. Consequently, I converted the data into a single measure to make the data comparable and uniform. To do this, I converted all of the single-profession education and experience requirements into hours, and then I converted all of the hourly requirements into a single metric of "Days Lost" to measure the combined education and experience requirement burden in terms of days. I followed the same steps that the Institute for Justice used in their initial data gathering. The conversions are as follows, directly cited from the Institute for Justice website:

- "Education/experience clock or contact hours were converted to days by first dividing hour requirements by six, which is about how much time a person might spend per day in full-time education (such as trade school or courses) or gaining on-the-job experience (such as working as a technician for an employer). If the total number of hours was equal to or more than 30, this was converted to weeks by dividing by five, to represent a five-day work week. Weeks were then converted back to days by multiplying by seven. The final number represents the total number of calendar days a person is shut out of their chosen occupation as a result of education/experience requirements."

- Days at or over five were divided by five, to represent a five-day work week, then multiplied by seven to convert them into estimated calendar days lost.

- Weeks were multiplied by seven.

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- Months were multiplied by 30.33.

- Years were multiplied by 365.

- Degrees were converted to years, which were then multiplied by 365. Although completion times of degree programs vary, this report uses standard completion times (i.e., associate's=2 years, bachelor's=4 years, master's=2 years)."[24]

Additionally, not all professions have all types of requirements - for example, an EMT in Alabama has an exam requirement and education requirement, but does not have an experience requirement. In these cases in which there was no statutory requirement, I changed the value to "0", to reflect that there were 0 days experience or 0 exams required by these states for these professions.

Still other professions in certain states had certain experience requirements for licensure that did not conform to a specific time period, but instead were contingent upon the completion of a certain task that was not uniform in the time period required for completion. For example, in Alaska, the experience requirement for licensure for a mobile home installer is listed in statute as the completion of "3 jobs". Since jobs can have varying lengths, I removed the value for the few inputs that had these types of experience descriptions. Below is a list of the inputs for which I removed the value, meaning that the value is missing in the data and thus is dropped from regressions.

[24] Carpenter et. al., 2017.

Table 2: Data Modifications

Variable Name – State/Year	**Change Made to Data**
MoblHomeInstlExpHr – Alaska 2017	Changed from "3 jobs, mobile home installers" to no value.
MoblHomeInstlExpHr – North Carolina 2017	Changed from "5 jobs, mobile home installers" to no value.
SheetMtlContrHVACResExpHr – Mississippi 2017	Changed from "3 jobs, contractors" to no value.
SheetMtlContrHVACExpHr – Mississippi 2017	Changed from "3 jobs, contractors" to no value.
InsContrComExpHr – Mississippi 2017	Changed from "3 jobs, contractors" to no value.
InsContrComExpHr – Alabama 2017	Changed from "3 jobs, contractors" to no value.
HVACComExperienceHr – Mississippi 2017	Changed from "3 jobs, contractors" to no value.
HVACResExperienceHr – Mississippi 2017	Changed from "3 jobs, contractors" to no value.
ElectricianEducHr – California 2017	Changed "approved apprenticeship program" to no value.
ElectricianEducHr – Colorado 2017	Changed "degree or trade school can substitute" to no value.
ElectricianEducHr – DC 2017	Changed "approved apprenticeship program" to no value.
ElectricianEducHr – Georgia 2017	Changed "apprenticeship training program approved by board" to no value.
ElectricianEducHr – Idaho 2017	Changed "approved coursework that is roughly 25% of the 4 year requirement" to no value.
ElectricianEducHr – Michigan 2017	Changed "credit based on degree length" to no value.
ElectricianEducHr – Montana 2017	Changed "apprenticeship training program approved by board" to no value.
ElectricianEducHr – Wisconsin 2017	Changed "apprenticeship training program approved by board" to no value.

4. Data Weaknesses

One weakness of the data is the metrics within the TAA datasets. Though they give data on the number of participants engaged in training and who exit from the program, the data do not break down exactly which participants enter which occupations or sectors, making it hard to determine how many participants are receiving what types of training, and how many participants engaged in required training for licensed professions.

Ideally, I would have data on the occupation (or at minimum, sector) that each state's participants and exiters participated in, in order to compare the number of participants receiving TAA training in a certain heavily-licensed profession in each state with the relative burden of the licensing requirements for that same profession in the state. However, occupation-specific TAA data are not available. To determine which professions to study, I read the national annual TAA reports that list the largest industry sectors for TAA certifications, and made the assumption that the majority of training in each state was with the purpose of pursuing these jobs in these same industry sectors. Consequently, in the occupational licensing data, I chose to include professions that fell into or close to these same sectors.

There are also significant weaknesses with the occupational licensing data. Firstly, there is a very limited amount of data collected on occupational licensing – outside of the Institute for Justice and the National Conference of State Legislators, few organizations have collected data on licensing requirements across sectors. Additionally, due to the heavy research burden of collecting the various licensing requirements in each state, even the existing occupational licensing data across multiple sectors have only been collected by IJ and NCSL for two years – 2012, and 2017. Further, the two years of data collection did not use all of the same professions,

limiting the ability to compare results across the two. There is a great need for more data on occupational licensing requirements. In order to compensate for the lack of panel data, I take a cross-sectional approach, and examine the different outcomes between states in only the year 2017 – the year that had the widest range of data available.

V. EMPIRICAL MODEL

I used four regressions in this thesis – the empirical models are listed below:

Regression 1:

$$FinalDayTrain = \beta_0 + \beta_1 TotalExams + \beta_2 TotalTrainParticip + \beta_3 FundAllocation + \beta_4 EmplPopManufacturing + \beta_5 TotalExiters + \beta_6 EmplyRetainRate + \beta_7 EnteredEmplyRate + \beta_8 moAvgEarn + \beta_9 UnemploymentRate + \mu \qquad (2)$$

Regression 2:

$$FinalDayTrain = \beta_0 + \beta_1 TotalDaysLost + \beta_2 TotalTAAParticip + \beta_3 FundAllocation + \beta_4 EmplPopManufacturing + \beta_5 TotalExiters + \beta_6 EmplyRetainRate + \beta_7 EnteredEmplyRate + \beta_8 moAvgEarn + \beta_9 UnemploymentRate + \mu \qquad (3)$$

Regression 3:

$$moAvgEarn = \beta_0 + \beta_1 TotalExams + \beta_2 EnteredEmplyRate + \beta_3 UnemploymentRate + \beta_4 TotalTAAParticip + \beta_5 FinalDayTrain + \beta_6 MeanHouseholdIncome + \beta_7 EmplPopManufacturing + \beta_8 FundAllocation + \mu \qquad (4)$$

Regression 4:

$$moAvgEarn = \beta_0 + \beta_1 TotalDaysLost + \beta_2 UnemploymentRate + \beta_3 TotalTAAParticip + \beta_4 FinalDayTrain + \beta_5 MeanHouseholdIncome + \beta_6 EmplPopManufacturing + \beta_7 FundAllocation + \mu \qquad (5)$$

Where:

Table 3: Variable Definitions

FinalDayTrain	The number of TAA participants in each state who were still in training as of the final day of the period.
moAvgEarn	Average monthly earnings for TAA participants in that state who "exited" the program.
FundAllocation	The amount of funding from the federal TAA program that each state received in the period.
TotalTAAParticip	Total number of TAA participants in each state in the period.
TotalTrainParticip	Count of all TAA participants who are in TAA approved training for at least one day in the period.

TotalExiters	Total number of TAA participants who "exited" the program – who no longer use the services of the TAA program.
EnteredEmplyRate	The rate of TAA program exiters who have successfully entered into employment in the first quarter after program exit.
EmplyRetainRate	Of those TAA participants who were employed in the first quarter after program exit, this is the percentage of those who were successfully employed in the 2nd and 3rd quarter after exit.
TotalDaysLost	A variable that we created to show an overall picture of the licensing burden from training and education day requirements in the state – see explanation below.
TotalExams	A variable that we created to show an overall picture of the licensing burden from exam requirements in each state – see explanation below.
UnemploymentRate	The state unemployment rate.
EmplPopManufacturing	The percentage of those employed in the state who work in the manufacturing sector.
MeanHouseholdIncome	The mean household income in each state.

The *moAvgEarn* and *FinalDayTrain* serve as representation of the TAA program outcomes, and are the dependent variables in my regressions. These two measures are meant to be two different ways of measure the impact of licensure in each state – the percentage of TAA participants who are participating in TAA training on the final day of the data collection period, and the monthly average earnings of program graduates ("exiters").

The primary independent variables in my regressions are two variables that I created for the purpose of this regression, TotalDaysLost, and TotalExams. These two variables combined, respectively, measure the total days lost due to training/education licensing requirements in each state and the total exams required for licensure in each state. To create these summary variables, I collected licensing data on 18 different professions in sectors similar to those that TAA participants often enter. These professions included emergency medical technician, tractor trailer truck driver, optician, HVAC residential contractor, HVAC commercial contractor, pharmacy

technician, truck driver, electrician, dental hygienist, licensed practical nurse, insulation

commercial contractor, HVAC commercial sheet metal contractor, HVAC residential sheet metal

contractor, earth driller, pest control, crane operator, athletic trainer, and mobile home installer. I

used data from the Institute for Justice and the National Conference of State Legislatures to

gather data for each profession's days of training/education required for licensure in each state,

and number of exams required for licensure in each state. The variable TotalDaysLost is a sum

of all of the days of experience requirements for all of the above listed professions in each state.

The variable TotalExams is a sum of all of the exams required for licensure for all of the above

listed professions in each state.

I also included additional control variables, including FundAllocation, TotalTAAParticip,

TotalTrainParticip, TotalExiters, EnteredEmplyRate, and EmplyRetainRate, to account for the

overall circumstances of the TAA program in each state, such as the levels of each state's

participation in different aspects of the TAA program, the funding level for the program in each

state, and what percentage of the program participants entered and maintained employment.

Additionally, I added the control variables UnemploymentRate, EmplPopManufacturing, and

MeanHouseholdIncome to account for the overall economic conditions in each state.

VI. RESULTS

Using the empirical model in the section above and the dataset described, I produced interesting results for my regression output. Due to the lack of multi-year data collected on occupational licensing, I focused my efforts on a series of OLS cross-sectional regressions, to examine how different types of occupational licensing burden affect the success of the TAA program.

As noted in the data section, I created two aggregate variables, TotalDaysLost and TotalExams, to represent each state's overall licensing burden across professions. Measuring both the total exam burden as well as the total training burden provide insight into two different types of licensing burden, and I projected that the different types of burden may not have the same effect on the selected measures of program success.

I also selected two different ways to measure the impact of occupational licensing on the TAA program. I chose to use the variable FinalDayTrain in order to measure the impact of occupational licensing upon the number of participants participating in training at any given time, predicting that tougher licensing requirements would lead to higher number of participants in training. I also chose to examine how licensing impacted the monthly average earnings of the TAA participants, as the goal of the TAA program is to train displaced workers to be placed in high-wage jobs. Since I lacked panel data, each of the four models included control variables to attempt to most accurately assess the impact of the licensing requirements upon the TAA.

I ran four separate regressions. The first two empirical models tested the impact of total number of licensing exams in each state upon the two chosen measures of TAA success – average monthly earnings post-TAA, and the number of TAA participants in training on the final

day of the data collection period. The second two empirical models tested the impact of the statewide aggregate total days lost due to occupational licensing requirements upon these same above measures of TAA success.

Table 4: Regression Results

VARIABLES	(1) moAvgEarn	(2) FinalDayTrain	(3) moAvgEarn	(4) FinalDayTrain
TotalExams	-136.3*	2.798*		
	(69.29)	(1.462)		
TotalTrainParticip		0.616***		
		(0.116)		
FundAllocation	-8.70e-05	3.66e-06	-5.12e-05	2.21e-05***
	(8.61e-05)	(4.60e-06)	(6.01e-05)	(2.45e-06)
EmplPopManufacturing	118.6	4.959**	160.3	2.554
	(168.4)	(2.292)	(143.2)	(2.220)
TotalExiters		-0.267***		-0.0844
		(0.0890)		(0.0584)
EmplyRetainRate		-38.02		6.371
		(36.85)		(51.21)
EnteredEmplyRate	3,235	38.09		-21.48
	(6,321)	(52.54)		(73.84)
moAvgEarn		0.00385		0.00337
		(0.00393)		(0.00417)
UnemploymentRate	-32.76	-2.132	-131.8	-3.188
	(517.1)	(6.898)	(415.1)	(8.135)
TotalTAAParticip	-0.989		-0.952	0.110***
	(0.762)		(0.721)	(0.0389)
FinalDayTrain	4.708		3.595	
	(3.883)		(2.469)	
MeanHouseholdIncome	0.00992		0.0255	
	(0.0226)		(0.0235)	
TotalDaysLost			-0.183***	0.00289
			(0.0637)	(0.00216)
Constant	8,487	-116.8**	7,458*	-35.65
	(5,517)	(47.91)	(3,711)	(61.55)
Observations	51	51	51	51
R-squared	0.176	0.970	0.148	0.946
F Statistic	1.359	445.6	2.284	152

Robust standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The findings in Regression 1 more closely align with my initial expected effects, although the F-statistic indicates that the coefficients jointly are not significant. As a result, these interpretations must be treated with some skepticism. However, the results show that the number of exams required for licensure have a negative effect upon the wages of TAA graduates, with each additional exam associated with a $136.30 decrease in average monthly earnings. This result was statistically significant at a 5 percent level of confidence, indicating a relatively high level of statistical significance. The high negative coefficient of the variable indicates that additional exams may harm the eventual wages of TAA participants. Though I hypothesized that additional licensing requirements would likely lead to a decrease in the success of the TAA program in finishing training and being placed in employment, I was unsure of the impact of exam requirements upon earnings. Potentially, in high-burden states, exiters would be able to command higher wages, due to licensing protection of many occupations. However, it appears that this is not the case.

The findings in Regression 2 demonstrate expected effects. This regression examined the impact of the number of licensing exams upon the number of TAA participants in training on the final day of data collection in that period. The positive sign of the coefficient indicates that each additional exam that a state requires in the sampled professions leads to 2.8 additional TAA participants being in training on the designated day, holding the control variables in the above equation constant. These results are close to traditional levels of statistical significance, with a p-value of 0.06. Though not all states' exam requirements are directly related to their training requirements – it is possible, for example, for certain professions to require exams for licensure but require no training for licensure – a higher value for TotalExam does indicate that the state

overall has higher barriers to entry in order to work, and indeed the data show that a higher exam

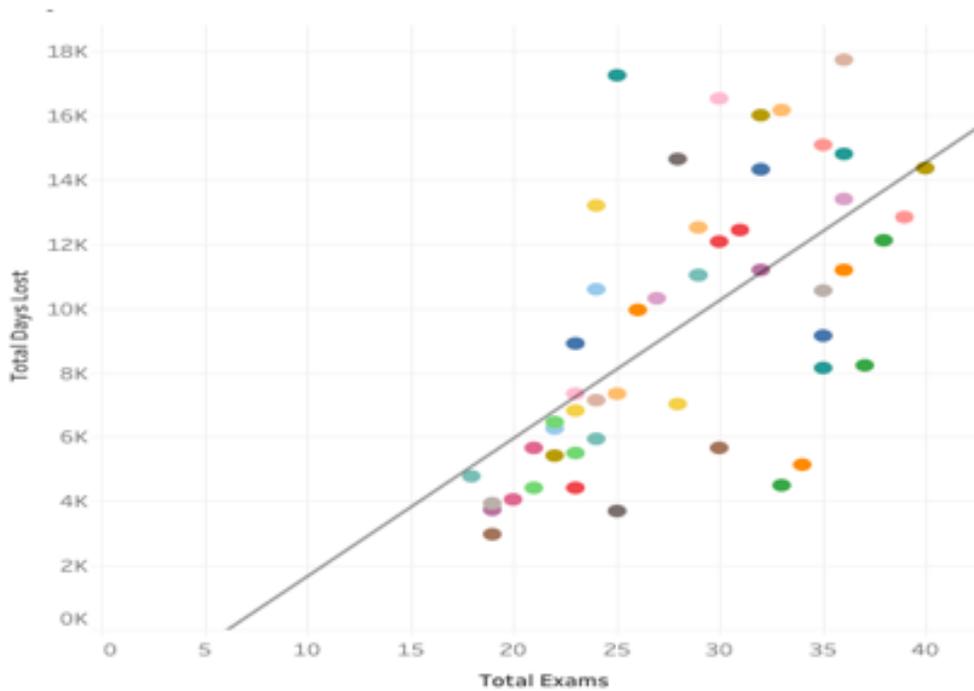requirement is associated with more days lost due to training (see Figure 2).

Figure 2: Relationship Between Total Exams and Total Days Lost

Regression 3 shows the results of my regression examining the impact of the total days

lost due to hourly training requirements in each state upon the wages of TAA participants. The

regression showed that for each additional day lost through training, a TAA participant will earn

$0.18 less per month for each additional day of training required. The negative sign of the

TotalDaysLost coefficient indicates that occupational licensing training requirements adversely

affect a TAA worker's wages, even after controlling for the effects of the state's unemployment

rate and mean household income. This finding is statistically significant at the 1 percent level,

indicating a high level of statistical importance. However, the coefficient itself is somewhat

small in magnitude, showing us that though additional training hour requirements are not

necessarily helpful in increasing the wages of TAA participants, they also do not have a significant adverse impact.

Finally, the findings in Regression 4 show the relationship between total days lost due to training requirements and the number of TAA participants who are in training on the final day of the data period. The results show that for each additional day lost, 0.002 additional participants will be in training on the last day of the data period. These results are further away from statistical significance than those in Regression 2, with a p-value of 0.187. This result was unexpected, because a state with an overall high training requirement for licensure would be expected to have a positive relationship with the number of TAA participants in training at any given date. The small coefficient, combined with the low statistical significance of the coefficient, leads me to posit that there may be an additional factor that is unaccounted for in this dataset that may be obscuring the relationship.

1. **Interpretations of Select Control Variables**

Across regressions, we can also see interesting results for the control variables. I have three variables that were used in all 4 regressions – FundAllocation, EmplPopManufacturing, and UnemploymentRate.

The variable FundAllocation, represents the amount of federal funding that each state was allocated. In each of the regressions, the coefficient was quite small, indicating that each additional dollar of funding had a minimal impact upon TAA participants reaching the final day of training, and on the TAA exiters' monthly average earnings upon graduation from the

program. In regression 4, this finding is statistically significant at the 1 percent level, indicating a high level of statistical importance.

The variable UnemploymentRate – representing the unemployment rate in each state – had a negative coefficient across all regressions, indicating that a higher unemployment rate was associated with fewer TAA participants reaching their final day of training, and to a lower monthly average income of TAA program graduates. However, none of these variables had high levels of statistical significance, meaning that this conclusion must be treated with skepticism.

The variable EmployPopManufacturing – representing the percentage of the state's total employment that is within the manufacturing industry – had a positive coefficient across all four regressions, indicating that more manufacturing jobs were associated with a greater success of the TAA training program, and with higher wages post-graduation. In the second regression, the variable EmployPopManufacturing was statistically significant at the 5 percent level, meaning that one additional percentage point of the state's workforce that works in the manufacturing industry is associated with 4.95 additional TAA training program participants reaching their final day of training. This result is consistent with our knowledge of the TAA program – the large majority of workers who participate in the TAA program were displaced from the manufacturing industry, and many seek to continue to work in the manufacturing sector. Manufacturing is not a heavily-licensed sector, but it does frequently require a period of training for employment – thus, likely the TAA graduates in a state with a robust manufacturing sector have an easier transition and are more motivated to complete training and continue working in manufacturing, than are TAA participants in states with smaller manufacturing industries who must complete more complex training in another sector with which they are unfamiliar.

VII. CONCLUSION AND POLICY RECOMMENDATIONS

In this thesis, I sought to examine whether burdensome occupational licensing requirements at the state level hurt the success of the TAA worker training program. I expected the results of my model to show that states with burdensome licensing requirements have a lower success rate than states with low licensing requirements.

The results of the regressions largely supported this hypothesis, although the findings were more complex than I suspected. Firstly, I must caveat all of my findings with the note that given the lack of existing panel data on the changes in occupational licensing requirements in the states over time, the results from my data only show a snapshot in time. A better picture of the true impact of state occupational licensing requirements upon the success of the TAA worker retraining program could be found by examining panel data, over time. The results section above showed that the two measures of occupational licensing requirements – exams and total days lost – had a positive association with a TAA participant being in training on the final day of the data collection period. This fit with the hypothesis that higher licensure requirements would cause more participants to be in training for a longer time. Additionally, these same licensing variables had a negative impact upon the monthly average earnings of graduates of the TAA program. The total days lost due to licensure in each state keyed with the above trend, but had a very small impact upon both the monthly average earnings and the number of TAA participants reaching the final day of training.

The number of exams required for licensure had a greater impact upon TAA outcomes. An increased number of exams was associated with more TAA participants participating in training – each additional exam was associated with 2.78 additional TAA participants being in training on

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the final day of the data collection period. Additionally, keeping with the above trend, a greater exam burden for licensure also appeared to harm the earnings of TAA participants upon graduation from the programs, as each additional exam required by a state was associated with a $136.30 decrease in average monthly earnings, which is approximately $1,600 less per year.

As noted above, my predicted impact of licensing upon earnings was uncertain – I had initially posited that impacts upon income could be positive, because a protected profession is able to keep wages artificially high, but would most likely have an overall negative effect. Both of these results were consistent with my prediction that burdensome licensure requirements would decrease the overall success (measured in terms of earnings) of TAA participants. Though a straightforward measure of the impact of licensing upon wages may indeed show that licensing raises the wages of those in a licensed profession, the regressions performed in this thesis do not measure that relationship – they measure the impact of licensure requirements upon the *overall* outcomes of the larger TAA program. We have no TAA data to account for how many TAA participants trained in licensed professions, and so these results may be due to a highly-licensed state preventing TAA graduates from accessing highly-licensed high wage jobs, with unlicensed jobs earning significantly less. Without more specific data, I am not able to pinpoint the source of this result, but it does indicate that licensure requirements are associated with lower wages for TAA program graduates.

Drawing from these findings, the policy recommendations section is in several parts, because while the TAA program is funded and authorized at the federal level, occupational licensing requirements are set almost entirely by the states. I present several policy recommendations aimed to help federal policymakers, on how to best improve the TAA program,

as well as additional policy recommendations to state policymakers, on how to lessen the burden of occupational licensure.

On licensing, there have been several notable recommendations given by the federal government, most notably the July 2015 Framework for Policymakers written by the White House under President Barack Obama. This report goes into great detail about recommendations for reform. However, for our purposes, I will make a shorter set of recommendations. First, states must reexamine their existing licensing laws and either adjust downwards overly burdensome requirements, or even eliminate unnecessary licenses entirely to increase the ability of retrained employers to access high-wage employment. The variation of exam and experience requirements for many professions state-to-state – most without any discernible differences in safety or quality for consumers – indicate that the majority of licensing may be largely unneeded in many cases, and policymakers should subsequently move to reduce unnecessary red tape if it is harming the wages of TAA exiters. When it is impossible to remove licensing requirements entirely, states should seek to shift to less-burdensome requirement, such as certifications, that will not restrict entry into the profession. Additionally, states should seek to avoid imposing new licensing requirements absent clear and significant evidence of consumer harm, and the evidence presented must be retrospective; states should not preemptively regulate without doing an examination of the full economic effects of regulation. Finally, when a state determines that licensing is required, they should implement sunset provisions on all existing and newly-created licenses, so that there can be a timely review and reconsideration of the necessity of these requirements at regular intervals.

As the regression indicated that the state-level occupational licensing requirements are in part responsible for the lack of increased earnings after completion of the TAA training program, most of my reform recommendations address occupational licensing reforms. However, there are still things that can be done to help the TAA program better serve its workers. First, the federal government must seek to reform TAA to guide workers to high-paying jobs. One option may be to encourage trainees to enter occupations that are locally in-demand, so that they have better employment and earnings prospects. The federal TAA program should also continue to coordinate closely with their state counterparts in order to ensure that funding for training is going to professions that will be suitable for each individual participant.

One final important policy recommendation for both areas is to have more data available for further analysis. There is currently no database tracking how each state's occupational licensing requirements have changed over time – policymakers must put together these data piecemeal. Ideally, for this thesis, I would have examined the impacts of licensure over time, as requirements changed. This way, I would be able to isolate the impacts of the policy change upon the TAA program outcomes. The best way to help policymakers understand the impact of occupational licensure is for the government to collect data over time that keeps track of the different licensing requirements in each state.

The TAA data could also be improved by being more detailed. Though there is already fairly robust data collection for the TAA program, there are no public data on the industries into which TAA graduates enter upon graduation from training programs, making it difficult to pinpoint how specific licensure requirements impact the TAA outcomes for the industry of that licensure (e.g., how an increase in the days of training required to be licensed as an HVAC

contractor impacts the number of TAA exiters who become successfully employed in the construction industry). These data would additionally be useful in different contexts outside of the range of this thesis, such as tracking what types of training lead to successful employment in growing industry sectors.

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