The Impact of Experience on Wage Premiums for Permanent Employment-Based Visa Applicants in the Information Technology Sector

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THE IMPACT OF EXPERIENCE ON WAGE PREMIUMS FOR PERMANENT EMPLOYMENT-BASED VISA APPLICANTS IN THE INFORMATION TECHNOLOGY SECTOR

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Abstract

The employment-based (EB) visa process is the primary government-sponsored visa program for companies looking to retain international talent on a permanent basis. This study analyzes wage levels for job applicants being sponsored for an Employment-Based 2 (EB-2) or Employment-Based 3 (EB-3) visa in the information technology (IT) sector. Specifically, this research uses data from the Program Electronic Review Management (PERM) Certification process, used by the Department of Labor to ensure that companies are only hiring international workers when there are not domestic equivalents. The PERM process is extremely thorough and provides a wealth of data that can be used to determine factors influencing wages offered to EB workers in the technology sector. This paper focuses on the difference between prevailing wages, determined by the Department of Labor through industry surveys and defined as the average wage for a specific position in a commutable area, and the wages offered by sponsoring companies for the same position. This gap is called the wage premium." Results from regression models indicate that there is a negative correlation between experience and wage premium. This result is contrary to the traditional hiring process, where more experienced workers would command higher wages. The hypothesis for this result is that EB workers provided significant productivity gains compared to domestic workers. Further, the productivity gains are more significant for workers with less experience compared to workers with more experience.

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1 Introduction

Immigration is a political hotspot for the United States; however, the majority of conversations revolve around illegal immigration and unskilled labor. When researchers do focus on legal, skill-based immigration, a majority of that research has been on the benefits and shortfalls of the H-1B non-immigrant visa for temporary high-skilled labor. This paper will focus on a separate visa system known as the EB visa, and specifically on EB-2 and EB-3 visas. Due to regulatory requirements, obtaining an EB-2 or EB-3 visa entails completion of the Program Electronic Review Management (PERM) Certification Process, which certifies that an individual fulfills the requirements for an EB visa.

To obtain an EB-2 or EB-3 visa, an employer must go through the PERM Certification process, proving to the Department of Labor (DoL) that the company is unable to find a native candidate with the skills for the open position. The PERM Certification is submitted to the DoL and can either be certified or denied. The process is lengthy and complex, making it a significant barrier for hiring foreign workers. The intent of the process is to ensure that companies only pursue the most capable workers.

1.1 Legal History of the Permanent EB Visa Process

The US Government passed the 1990 Immigration Act to update and amend the Nationality Act of 1965. Major changes in the 1990 legislation included the expansion of permanent EB immigration visas from two categories to five: EB-1 through EB-5. The EB-2 visa is reserved for candidates holding advanced degrees or deemed to have exceptional abilities, and the EB-3 visa is reserved for candidates with bachelor's degrees or who are considered skilled workers. In addition to creating these new categories, the Act mandated that a maximum of 140,000 visas could be issued yearly among the five types, with specific percentages allocated to each visa category. Roughly 40,000 EB-2 and EB-3 visas are made available each year.

Navigating the PERM process is a particularly onerous and expensive task placed on employers seeking to obtain EB-2/3 visas for a potential employee. At the most basic level, the PERM process is meant to ensure that domestic companies are not hiring foreign workers if there is a domestic worker who is considered "qualified" for the position. The process requires an exhaustive period of notifications, advertisements and recruitment. Additionally, the PERM process carries the requirement that foreign workers must be at least paid the geographic prevailing wage for a specific position. This requirement was put in place to ensure that foreign companies could not damage the domestic labor market by hiring more accomplished foreign born workers at lower rates than their domestic counterparts.

The PERM process has been heavily criticized for placing an undue burden on US companies, and for reducing the attractiveness of the US for foreign-born workers. Legislation has been proposed on several occasions to amend the process, with little success. In particular, the Comprehensive Immigration Reform Act of 2007 contained language that would have dramatically increased the cap of 140,000 for EB visas, and instituted a soft-cap so that the number could fluctuate based on demand. In that same year, the Senate took up the Securing Knowledge Innovation and Leadership Act, which would have applied unused visas from past years to increase the cap for future years. In both circumstances, however, the legislation failed.

A separate argument has been made that the quota system is entirely unnecessary for EB2/3 visas, because it serves an overlapping function with the PERM process (Leech and Greenwood, 2010). The quota system is in place to ensure that the domestic market is not over-saturated with foreign-born workers, and the PERM process ensures that there is no available native worker qualified for a specific position. If the PERM process stood alone, and was functioning properly, it would allow companies to fill all domestic positions where a qualified native worker could not be found. As a result, it is unlikely that this would cause damage to the domestic labor market, because it

would be satisfying unmet company demand for workers. By itself, the PERM process would enable companies to have sufficient numbers of qualified workers and function at maximum efficiency without harming the domestic job market (Leech and Greenwood, 2010).

1.2 Current Policy Initiatives

In recent years, various pieces of legislation have been put forward in Congress to significantly amend US visa programs. Most recent is the *H.R.2131 - SKILLS Visa Act* sponsored by Rep. Darrell Issa. The SKILLS (Supplying Knowledge-Based Immigrants and Lifting Levels of STEM) Visa Act would make significant changes to the current EB visa program. Specifically:

1. The available number of EB visas across all levels would increase from 140,000 to 235,000.

2. An EB-6 visa would be introduced with a cap of 55,000 persons per year. The EB-6 would be for individuals with doctorate degrees in a STEM field, or qualified Medical Doctors.

3. An EB-7 visa would be introduced for individuals who hold a masters degree in a STEM field. EB-7 availability would comprise unused EB-1 and EB-6 visas on a yearly basis.

4. The creation of an EB-8-1 visa for entrepreneurs of venture capital backed starts-up in the US.

5. Elimination of per-country yearly limits on EB visas (current cap is 7,500 per country).

Despite the existence of progressive EB visa reform bills, the transition from President Obama to President Trump significantly alters the immigration policy landscape. Early

actions by the new Administration indicate it will push for a reduction in the number of skilled foreign workers allowed into the country.[1]

2 Literature Review

2.1 Immigrants and Productivity

Anecdotally, there are reasons to believe that immigrants would inherently possess a set of traits that others do not. Leaving ones homeland to start an education or a career in a foreign country is a major life decision that the majority of people do not make. It stands to reason that this willingness to uproot and dive into the unknown, potentially without a network or knowledge of the new language, would correlate with specific traits. Research on the question of immigrant productivity has taken on greater importance over the past several decades, as developed countries have started looking more seriously at the economic effects of globalization.

In Canada, researchers found that among a sample of 52 successful entrepreneurs, the 10 immigrant entrepreneurs were likely to be more successful, measured by company revenue, than their successful native counterparts. This result was significant at $p < .01$ (Dalziel, 2008). The study was not focused on immigrant entrepreneurs overall, only those that were educated and displayed characteristics indicative of successful adjustment to life in their new country. The implications of this study are that among a group of successful businessmen, being an immigrant is a trait that correlates with an additional level of success compared to native entrepreneurs. The study does not attempt to answer "why", but provides two possible explanations: personality traits inherent to immigrants, and more effective use of social networks.

A second study, focused on the impact of immigration on US state-level productivity and also found a positive relationship between immigration levels and productivity (Peri,

[1] See: Trump and Sessions plan to restrict highly skilled foreign workers. Hyderabad says to bring it on. - Max Bearak, The Washington Post, Jan 8, 2017

2012). The study looked at the impact of net immigration since 1960 on growth factors in the 50 states and the District of Columbia. Variables that were significantly correlated with positive net immigration changes were: income per worker, factor productivity and average hours worked. Additionally, the study found no indications that immigration increases caused a corresponding decrease in native employment. More interestingly, the study found that the productivity gains were larger for unskilled workers than for skilled workers (although all groups saw productivity gains). The theoretical conclusion is that increases in immigration enable workers across the all skill levels to specialize in positions where they are most likely to succeed. This conclusion implies that increases in immigration levels could lead to increased specialization in the overall economy that would translate to productivity gains.

In addition to revenue and worker efficiency, patenting rates are a common way to measure growth and innovation. Indications are that immigrants have a profound impact on patenting rates (Hunt, 2011). Specifically, a 1.3% increase of college-educated immigrants in the population corresponds to a 12% to 21% increase in patent rates per capita. The impact is even more profound in the STEM professions, where a .45% increase in the number of immigrant scientists and engineers corresponds with a 13% to 32% increase in patents per capita (Hunt, 2011).

These studies are particularly important because they display positive economic impacts of immigration from four dimensions: entrepreneurship, high-skilled labor efficiency, low-skilled labor efficiency and patents per capita. Understanding the potentially broad positive economics benefits of skilled immigrantion is a critical factor when attempting to understanding the decision making process of companies sponsoring workers for EB visas.

In addition to studies that have focused on the productivity of immigrants in their new countries, other studies have looked to quantify how transferable productivity is from a home country to a foreign country. Friedberg (2000) analyzed how the nation

of origin for an individual's education and experience impacted their earning ability in Israel. The paper finds strong evidence that education and experience earned outside of a host country is valued significantly less than experienced earned domestically. As a result, immigrants who received their education and work experience abroad receive lower wages than their native counterparts of equal skill.

While interesting, the previous study is not directly related to this research due to a mismatch in the study populations. Both studies focus on immigrants, however Friedberg's study analyzed immigrant wages compared to native wages when both individuals had relatively equal skills. In contrast, immigrants who receive an EB visa are deemed to not have a comparable in the native population, making it impossible to draw the same comparison. However, Friedberg's study is useful in understanding how immigrants' skills are valued generally and helps paint a picture of how the individuals pursuing an EB visa may be viewed differently in the hiring process.

2.2 The Impact of EB Visas on Wages

The published economic benefits of immigration help explain why free flow of skilled labor is a topic of utmost importance to industry leaders.[2] Lobbying by high-powered business executives is a result of the current system for hiring foreign workers is failing to meet company needs. Each year, the government issues 85,000 H-1B visas, but receives 2.7x that many applicants (USCIS, 2016b). Similarly, workers from India and China attempting to permanently relocate to the US through the EB visa process are forced to wait years. The backlog has become so extensive that the government is currently processing EB-2 visas for Indian workers filed before June 2008, EB-3 visas before March 2005 [3], and the average wait time overall is 4.4 years (Papademetriou and Sumption, 2011). Companies continue to make use of the visa process despite the extensive backlog,

[2]see:Break the Immigration Impasse: Sheldon Adelson, Warren Buffett and Bill Gates on Immigration Reform, The New York Times - July 10, 2014

[3]see: US State Department Visa Bulletin - March 2017: dating for filing of Employment-Based Visa applications

indicating a high level of demand for the type of skilled labor that foreign workers supply.

The H-1B temporary work visa program for skilled labor is the most popular work visa, and has received considerable attention in academic literature. However, academics have not reached consensus about the program's impact on the domestic labor market. Zavodny (2003) found that high concentrations of H-1B workers do not have a negative impact on native wages or the unemployment rates. Rothwell and Ruiz (2013) echoed the results found by Zavodny, and found further evidence that H-1B workers were being hired for positions that could not be filled domestically. Their research showed that "43% of job vacancies for STEM occupations with H-1B requests are reposted after one month of advertising." Lofstrom and Hayes (2011) conducted a more in-depth analysis on the quality of H-1B workers, finding that they were younger (32 vs. 41.4 for native workers) and more highly educated (59% have advanced degrees vs. 40% domestic) than domestic workers. These statistics bolster industry claim that H1-B workers are occupying positions that could not be filled domestically.

However, opponents of the H-1B program have presented research claiming that these workers harm the domestic economy. Miano (2008) found no relationship between H-1B visas and job creation. Matloff (2008) found that foreign workers hired through the H-1B program are "no higher talent than the American workers, as measured by salary, patent filings, dissertations awards, and quality of academics work." Matloff also asserts that the technology industry uses the H-1B process as a way to hire younger, foreign workers at the expense of older, native employees.

Research into the H-1B process is helpful for framing research into the EB visa process because EB visas have been studied significantly less, and few conclusions reached regarding its impact on the domestic economy. Peri and Sparber (2011) showed that foreign-born and native workers are imperfect substitutes. As a result, they occupy different positions in the workforce, with foreign workers tending to hold more analytically based positions and domestic workers moving towards occupations

requiring high levels of communication and interaction. Zavodny (2003) came to the same conclusion, noting that human capital incurred in foreign countries was not as easily transferable to the US market as technical skills like software development, economics and mathematics. Mukahopadhyay and Oxborrow (2011) looked at H-1B workers transitioning to EB visas and found that these workers experience a wage increase of $11,860. However, the authors note that the green card process gives an overwhelming amount of power to employers, which may actually be suppressing the potential wage gains for immigrants. Matloff (2008) argued that EB visa workers harmed the domestic labor market because they were not superior to domestic workers. He concluded that to be superior, EB workers should be valued in the highest percentiles, as determined by wages from their employer, but his analysis concludes that EB workers fall roughly in the 75th percentile.

Information from these papers is useful in forming an opinion about the relationship between immigrant worker experience and wage premiums. However, none of these papers focus directly on the EB wage premium. Peri and Sparber focused on economic substitutes, Mukahopadhyay and Oxborrow looked at the change in wages that resulted from a transition in visa type and Matloff argued that the system is flawed because EB workers are not being paid a "premium" wage.

2.3 Supply, Demand and Wage Impact

The market for immigrant employment is intensely distorted by government regulations. Data showing that demand for visa slots constantly outstrips supply implies a high level of demand from US employers for immigrant workers (USCIS, 2016a), but limitations make it impossible to determine if there would be an adequate supply were the process functioning without constraints. In a traditional economic model, if there was excess supply or a decrease in demand, wages should fall while supply constraints or increased demand would result in the opposite. However, the complexities of the labor market

make it too difficult to distill down to a simple model. Peri, et al. (2012) noted that foreign immigrants are much more likely have graduated from college with a STEM concentration, while natives were more likely to have focused on education or the social sciences. This mismatch in skills implies that immigrants are not "taking jobs" from native workers. Instead, immigrants arriving in the US have skills that may complement, not crowd out, the domestic workforce. Additionally, the authors note that innovation gains from immigrants focused on the STEM sector would have positive spillover effects, resulting in overall wage growth.

In addition to the potential for immigration to have a positive impact on wage growth due to imperfect substitution, workers who are employed through the sponsorship program may receive higher wages because of "second-moment" discrimination. As it relates to wages, "second-moment" discrimination is the decrease of average wage offers due to high variance in productivity levels among a defined group (Dickinson and Oaxaca, 2006). For example, high levels of productivity variability among recent male graduates from state colleges may result in decreased average wages for the entire subgroup. The nature of the EB worker program could mean these workers benefit from "second-moment" discrimination because the stringent hiring practices, plus past experience, give employers confidence that worker productivity will be high. This may result in higher wages for the entire group, despite the lack of bargaining power immigrant workers have in the hiring process.

This research paper is not an analysis of comparing immigrant vs. native wages. However, wage data from the DoL plays a prominent role in the statistical analysis and is used as the measure for market wages. While the data collected for this market wage does not discriminate between immigrant and native workers, the data collected on wages for new immigrant hires indicates that they are being paid, on average, above market wages. This finding correlates with the research on imperfect substitutes and is consistent with the concept of "second-moment" discrimination.

An alternative approach to an analysis of EB worker wages could be through a signaling model. Signaling theory is the idea that one party is able to convey a ' 'signal" to another. For example, earning a PhD could be a signal to employers about a job applicant's ability level or commitment to a particular field. In their 2012 paper, Deidda and Paolini focused on the potential breakdown of education as a signaling tool for hiring, and identified four distinct groups of workers: rich and skilled, rich and unskilled, poor and skilled, poor and unskilled. They propose that wage increases for high-skilled workers have outpaced wage gains for low-skilled positions, creating an education race. Under this scenario, all workers will pursue higher levels of education, which will then lead to a steady increase in the price of education. At a certain point, the price of education will become too high and the "poor and skilled" group will no longer be able to afford it or will not be able to justify the expenditure because the costs will outweigh the benefits.

As a result, "rich and skilled" workers would obtain the highest wages while "poor and skilled" workers will be grouped in the middle with the "rich and unskilled." The high level impact is that companies that rely on the education signal as a filter for job applicants will see a lower amount of skilled workers. Further, "poor and skilled" and "rich and unskilled" both occupying the intermediate group translates to a substantial amount of variance in ability levels within the group. If this situation is combined with "second-moment" discrimination, the high-skilled group will have low variance and higher wages, while the intermediate group will receive lower wages due to high variance regardless of the individual skill level.

A potential breakdown in education signals has implications for potential EB workers. Employers could, for instance, decide to look for a candidate in the middle pool. The high level of variance in this group makes it likely that employers would have to interview a substantial number of candidates before hiring, or hire multiple workers to match the productivity level of a single high-skilled worker. Alternatively, employers could sponsor

an EB worker with more assurances that the employee would bring a high level of productivity to the workplace.

3 Theoretical Considerations and Hypotheses

A key aspect of the PERM certification process is the prevailing market wage. This wage is determined by the DoL, through private sector surveys, and sets the average wage for a given occupation in a commuting area. The government further specifies prevailing wage statistics by experience, as exhibited in Figure 1. When a company sponsors a foreign worker, it is required to offer that worker at least the prevailing wage based on occupation and the worker's prior experience. These regulations are in place to ensure that companies cannot hire foreign workers at below-market rates. Despite the law requiring companies to prove that there is not a US equivalent to the foreign worker they seek to sponsor, there is minimal guidance provided on how to define "equivalent." As a result, these foreign workers are likely to be significantly above average in ability, clearly demonstrating to the DoL that they do not have an equivalent US counterpart.

Wage Level	Description
Level I	**Entry**: Wage rates are assigned to job offers for beginning level employees who have only a basic understanding of the occupation. These employees perform routine tasks that require limited, if any, exercise of judgment. The tasks provide experience and familiarization with the employer's methods, practices and programs. The employees may perform higher-level work for training and developmental purposes. These employees work under close supervision and receive specific instruction on required tasks and results expected. Their work is closely monitored and reviewed for accuracy. Statements that the job offer is for a research fellow, a worker in training, or an internship are indicators that a Level I wage should be considered.
Level II	**Qualified**: Wage rates are assigned to job offers for qualified employees who have attained, either through education or experience, a good understanding of the occupation. They perform moderately complex tasks that require limited judgment. An indicator that the job request warrants a wage determination at Level II would be a requirement for years of education and/or experience that are generally required as described in the O*NET Job Zones.
Level III	**Experienced**: Wage rates are assigned to job offers for experienced employees who have a sound understanding of the occupation and have attained, either through education or experience, special skills or knowledge. They perform tasks that require exercising judgment and may coordinate the activities of other staff. They may have supervisory authority over those staff. A requirement for years of experience or educational degrees alongthat are at the higher ranges indicated in the O*NET Job Zones would be indicators that a Level III wage should be considered. Frequently, key words in the job title can be used as indicators that an employer's job offer is for an experienced worker. Words such as 'lead' (lead analyst), 'senior' (senior programmer), 'head' (head nurse), 'chief' (crew chief), or 'journeyman' (journeyman plumber) would be indicators that a Level III wage should be considered.
Level IV	**Fully Competent**: Wage rates are assigned to job offers for competent employees who have sufficient experience in the occupation to plan and conduct work requiring judgment and independent evaluation, selection, modification, and application of standard procedures and techniques. Such employee's use advanced skills and diversified knowledge to solve unusual and complex problems. These employees receive only technical guidance and their work is reviewed only for application of sound judgment and effectiveness in meeting the establishment's procedures and expectations. They generally have management and/or supervisory responsibilities.

Figure 1: Deparment of Labor Wage Level Designations

The hypothesis of this paper is that US-based technology companies are willing to pay EB-2 and EB-3 candidates in the Information Technology Sector above the mandatory prevailing wage because these foreign workers are more productive than the average US worker for a given position who has similar experience. The hypothesis focuses on employment in the IT sector because over 30% of PERM certifications in fiscal year 2015 were for jobs in this area. Within the IT sector subgroup, 43% of workers received a wage premium. Further, workers hired for a position carrying a prevailing wage level 1 designation were more likely to receive a wage premium than workers at any other prevailing wage level.

Table 1: EB Workers in IT who Received a Wage Premium.

	Count
No Wage Premium	17100
Wage Premium	13388
Total	30488

Table 2: EB Workers in IT who Received a Wage Premium by Wage Level.

	Level I	Level II	Level III	Level IV	Total
No Wage Premium	693	6617	3324	6466	17100
Wage Premium	1283	6075	2882	3148	13388
Total	1976	12692	6206	9614	30488

Workers being sponsored have less leverage in wage negotiations in comparison to a US citizen. A certain amount of leverage does come from the fact that EB-2 or EB-3 visa holders are not required to stay with the sponsoring company after the visa has been approved. As a result, companies do have an incentive to offer these workers wages above the prevailing wage, as a hedge against leaving the company after visa approval. However, the intrinsic value of the EB visa is likely much higher to the sponsored worker than any specific wage. As a result, companies have a decreased incentive to offer higher wages.

Below is a simple theoretical model for wage determination. This model assumes education and experience are considered the most important factors for determining wages for domestic workers. For non-native workers, the assumption is that immigration status, such as visa type, current location (living inside or outside the US) and education location, play an important role. The hypothesis is that while US education, experience and ability are all positively correlated with wage, being an immigrant and being educated outside of the US may carry a negative coefficient because of factors such as a decreased bargaining power for immigrate worker, bias against foreign education and/or increased costs for the hiring company associated with the visa process.

$$Wage = \beta_0 + \beta_1 US_Education + \beta_2 Experience + \beta_3 Ability + \varepsilon_i$$

Figure 2: Simple Wage Equation for US Citizen.

$$Wage = \beta_0 + \beta_1 US_Education - \beta_2 Foreign_Education + \beta_3 Experience + \beta_4 Ability - \beta_5 Immigration_status + \varepsilon_i$$

Figure 3: Simple Wage Equation for Non-US Citizen.

4 Data and Methods

4.1 Dataset

The analysis is based on publicly available PERM certification data, covering a period from the end of Q4 2014 to the end of Q4 2015. This data is accessible from the Office of Foreign Labor Certification within the DoL. The data is compiled based on the fiscal calendar, is released each year, and represents all PERM Certification forms that received a decision from the DoL during the stated time period. The variables within the data set

are based on the individual categories from the primary document required for PERM certification, known as ETA Form 9089. Additionally, each line of data represents an individual under consideration for certification [4].

4.2 Analysis Sample

The sample used for this study includes all individuals whose PERM applications received a ruling during the 2015 fiscal year, were designated as "Software Designers" or code "PSC 1020" according to the American Community Occupation Classification System on the PERM application, and were offered a wage from the sponsoring company that was higher than the DoL provided prevailing wage for the position. This sample population includes 13,388 individuals.

4.3 Variables

The dependent variable for the final regression model in this study is the difference between the logged prevailing wage level for a position and the logged offered wage level for that same position. The final regression model presented below includes controls for the main factors that may impact salary offers, including previous work experience, education levels, and country of origin. For a more detailed explanation of the variables in the model please refer to the fixed effects regression results in the appendix.

With all the appropriate control variables included, the final regression equation is:

$$Lgdiffpay_i = \beta_0 + \beta_1 masters + \beta_2 doctorate + \beta_3 Level_2 + \beta_4 Level_3 + \beta_5 Level_4 + \beta_6 Level2b + \beta_7 Level3b + \beta_8 Level4b + \beta_9 years_o ut + \beta_9 years_o ut + \beta_9 sqyears_o ut + \beta_{10} India + \beta_{11} China + \beta_{12} SMB + \beta_{13} Medcomp + \beta_{14} Largecomp + \varepsilon_i$$

Figure 4: Regression Equation

[4] the data is accessible through the DoL Foreign Labor Certification website in the OFLC Permance Data section

4.4 Data Limitations

Four data-points are not available but would be beneficial to the overall analysis:

1. EB-2 or EB-3 Visa - The dataset does not distinguish between EB-2 or EB-3 sponsorship. Based on the visa descriptions, EB-2 applicants should possess greater abilities than EB-3 applicants and it is likely that they would therefore command more of a wage premium. If these designations were included in the dataset, the final analysis would be broken out by visa category.

2. Gender - The dataset does not include information about the applicants' gender. Given the persistent pay gap between women and men in the United States, it would have been interesting to learn if the wage premium is impacted by the gender of the candidate.

3. Age - While the formal PERM application does include information on candidates' age, this information was excluded from the publicly available data set. As a proxy for age, a variable for years-since-graduation was created for the model. However, this is an imperfect substitute because individuals may begin undergraduate and graduate level education at different ages.

4.5 Methodology

This paper will explore the impact of experience on the wage premium for workers being sponsored for an EB 2/3 visa. The relationship is explored through a linear regression model, where the dependent variable is the difference between the log of the offered wage and the log of the prevailing wage level. The analysis includes control variables for prevailing wage level, hiring company, education level, if the individual was educated in the US, and if they are a Chinese or Indian national. A variable for years since graduation is included as a proxy for employee age, because age is not included in the dataset.

In addition to these control variables, a series of interaction variables between the prevailing wage level and education levels were generated. The hypothesis for including these interaction variables is to explore the possibility that possessing a masters or doctorate degree at each prevailing wage level impacts the wage premium for the applicant differently. In other words, the difference in wage premium for bachelor's and master's degree holders at prevailing wage level 1 is not the same at prevailing wage level 4.

After including interaction variables, two fixed effect regression models were generated and can be seen in the appendix. The fixed effects models investigate the possibility that not controlling for state of work or country of origin resulted in improper grouping of the data. For example, the fixed effects estimation for state of work investigates the possibility that wages for workers in New York and workers in California are affected by the variables in different ways and that they should be analyzed separately. Column two shows the fixed effects regression for state of work, and Column Three shows the same for country of origin. In both instances, the adjusted R^2 value of the models was harmed for including too many variables. This led to the conclusion that the dataset was not suffering from improper grouping.

4.6 Descriptive Statistics

Table 3 shows that the highest concentration of job offers were extended with a prevailing wage level 2 designation. However, the number of offers extended for the three other prevailing wage designations are not insignificant. The largest number of jobs carrying at least a level 2 designation is consistent with the intention of the EB program to attract "skilled" workers.

Table 3 also shows that the majority of applicants in the dataset have obtained either a bachelor's or master's degree. It is possible that the study's focus on the IT sector results in a lack of doctorate degrees. The average age of workers in the IT industry

Table 3: Prevailing Wage Level by Education

	Level I Count	Level II Count	Level III Count	Level IV Count	Total Count
Bachelors	951	1,389	890	2,063	5,293
Masters	324	4,401	1,860	1,049	7,634
Doctorate	8	285	132	36	461
Total	1283	6075	2882	3148	13388

is significantly lower than the age of the average worker nationally. As a result, the individuals in this dataset may not have had time to complete a PhD. [5]

The distribution of workers among the four wage levels, when segmented by education, is surprising. Table 3 shows that individuals with bachelor's degrees are most likely to be recruited for a job with a wage level 4 designation. Wage level 4 indicates that the applicant is very experienced at the role they are being hired for, and can be trusted to act independently. Interestingly enough, the same observation does not hold for master's and doctorate degree holders. In those circumstances, workers are most commonly recruited for jobs carrying a wage level 2 designation. This observation may indicate that companies do not believe educational achievement correlates with job skill aptitude.

When filtered by country of origin, immigrants from India and China dominate EB applications for the IT sector, with the vast majority hailing from India. Table 4 and Table 5 show that over 80% of applicants are from these two countries.

Table 4: EB Workers Born in India by Wage Level

	Level I Count	Level II Count	Level III Count	Level IV Count	Total Count
Not Born in India	683	2151	601	521	3956
Born in India	600	3924	2281	2627	9432
Total	1283	6075	2882	3148	13388

When broken down by prevailing wage level, distribution of applicants among the four

[5] see: Technology Workers are Young (Really Young) - New York Times, 06/05/2013

levels is consistent with the pattern observed in Table 3. A closer look at Table 4 shows the highest number of applicants from India being considered for jobs with prevailing wage level 2 designations, along with significant numbers for wage levels 3 and 4, but far less for prevailing wage level 1. For comparison, while Table 5 shows a similar pattern for Chinese applicants, the number of workers applying for a job with a wage level 4 designation is significantly lower than the number applying for jobs designated wage level 1.

Table 5: EB Workers Born in China by Wage Level

	Level I Count	Level II Count	Level III Count	Level IV Count	Total Count
Not Born in China	1110	5106	2695	3075	11986
Born in China	173	969	187	73	1402
Total	1283	6075	2882	3148	13388

Looking at the data from another angle, Table 6 shows that the majority of applicants were previously admitted into the US on a H-1B visa. This is consistent with the information presented earlier, that the IT industry is heavily reliant on this visa category for skilled labor. After H-1B, the second largest subset of workers were previously on L-1 visas (see table titled EB Workers Previous Visa Class in the Appendix). L-1 visas allow multinational companies to send employees from an overseas location to the US, as long as the employee works at that specific company's US location. The time period for L-1 visas varies by L-1 visa type. [6]

Table 6: H1B Visas and Prevailing Wage Designation

	Level I Count	Level II Count	Level III Count	Level IV Count	Total Count
Not Previously on H1B	185	650	281	362	1478
Previouly on H1B	1098	5425	2601	2786	11910
Total	1283	6075	2882	3148	13388

[6] see: Immihelp - L-1 Visa: Period of Admission (http://www.immihelp.com/l1-visa/period-of-admission.html)

While education levels are important, it may also be valuable to understand where that education was took place. Table 7 shows that roughly 60% of the dataset received their education outside of the US. In the final regression model, education location was not a significant factor in determining wage premium. The equation presented in Figure 3 hypothesized that there would be a penalty for being educated outside of the US. That the majority of the dataset was previously on an H-1B visa means even workers not educated in the US were likely working in the country for some period of time before applying for an EB visa. It is possible that this removes some of the bias that would result from being educated outside the US.

Table 7: EB Workers Receiving Education in the US

	Count
Not Educated in the US	7747
University in the US	5637
Total	13384

The overwhelming majority of workers in the dataset previously being on an H-1B visa gives some clues as to how long they have been in the US workforce. H-1B visa holders may remain in the US for consecutive three-year periods before either requiring permanent sponsorship or leaving the country. The histogram in the top left of Figure 5 shows a significant bump in EB visa applicants three years after graduation, which begins to drop off precipitously around year 15. This fits the general trend of workers seeking EB visa sponsorship at the end of their H-1B visa period of three or six years. though the significant percentage of applicants who are 10 or more years removed from graduation indicates that a number of applicants may work abroad after graduation before applying for an H-1B visa.

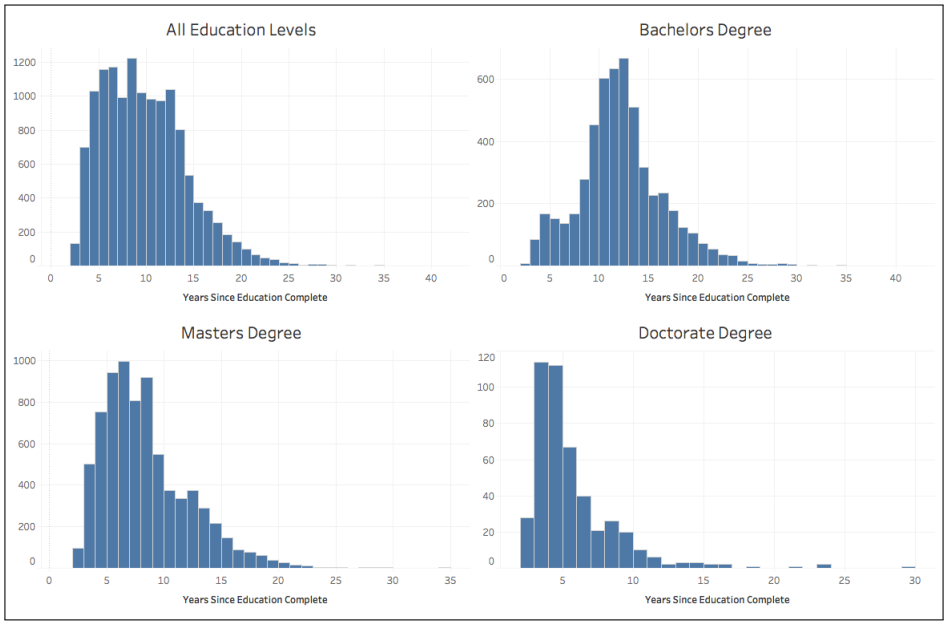

Figure 5: EB Worker Years Since Graduation

Figure 5 also breaks down worker years since graduation by education level. The trend that emerges between the three histograms is that as the degree level advances, the average year from graduation to applying for EB sponsorship becomes smaller. Bachelor's degree holders are most likely to be 10-12 years removed from graduation when they are sponsored for an EB visa. This level is reduced to 6-8 years for master's degree holders, and 4-5 for doctorate degree holders. This pattern is particularly interesting because it implies that many of the individuals in this dataset are around the same age when they receive sponsorship, regardless of education. The logic for reaching this conclusion is that the typical master's degree takes between 2 and 3 years to complete, while a doctorate degree can be completed in 4+ years. This time frame mirrors the changes in average time since graduation found at each level.

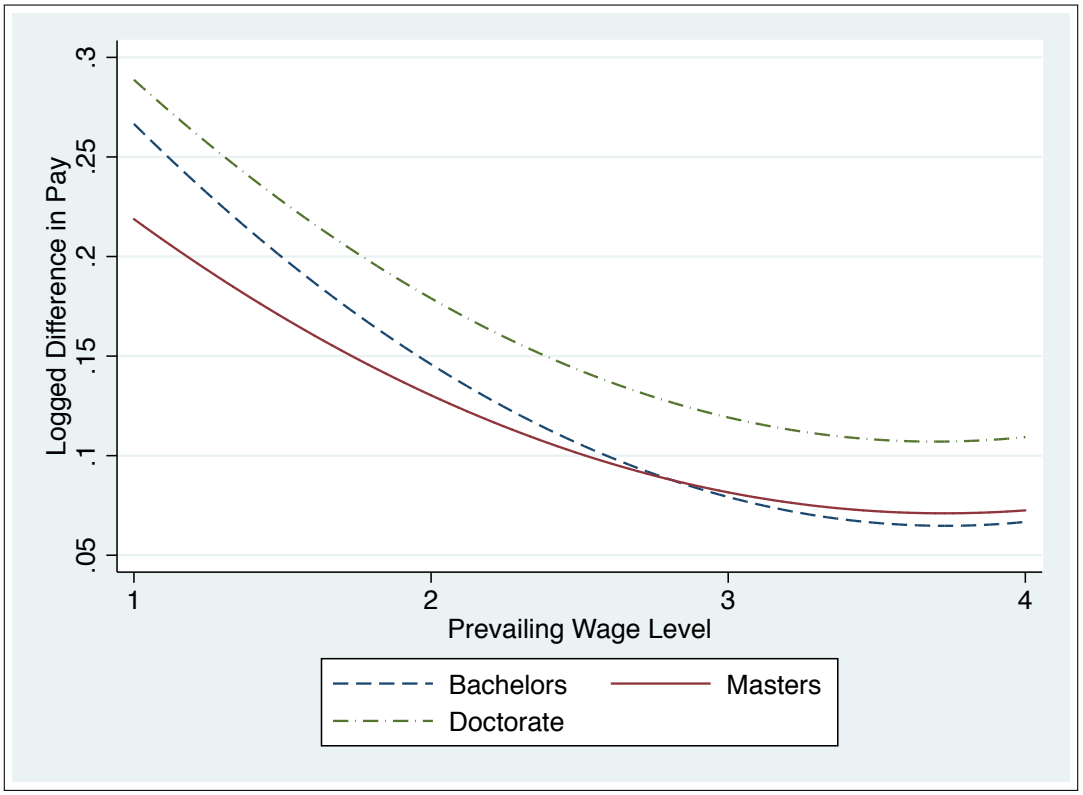

Figure 6: Logged Difference in Pay and Prevailing Wage Levels by Highest Degree Achieved

Moving past applicant age, Figure 6 displays the disparity in wage premium by prevailing wage level. According to the graph, EB workers receive the highest wage premium at prevailing wage level 1 and the smallest premium when hired for a job designated prevailing wage level 4. This stands in contrast with typical thinking, that experience is correlated with value. Specifically, Figure 6 shows that across degrees, workers being hired for a job designated prevailing wage level 1 are paid 23%-29% above market value, compared to workers at prevailing wage level 4 who are paid 7%-11% above market value.

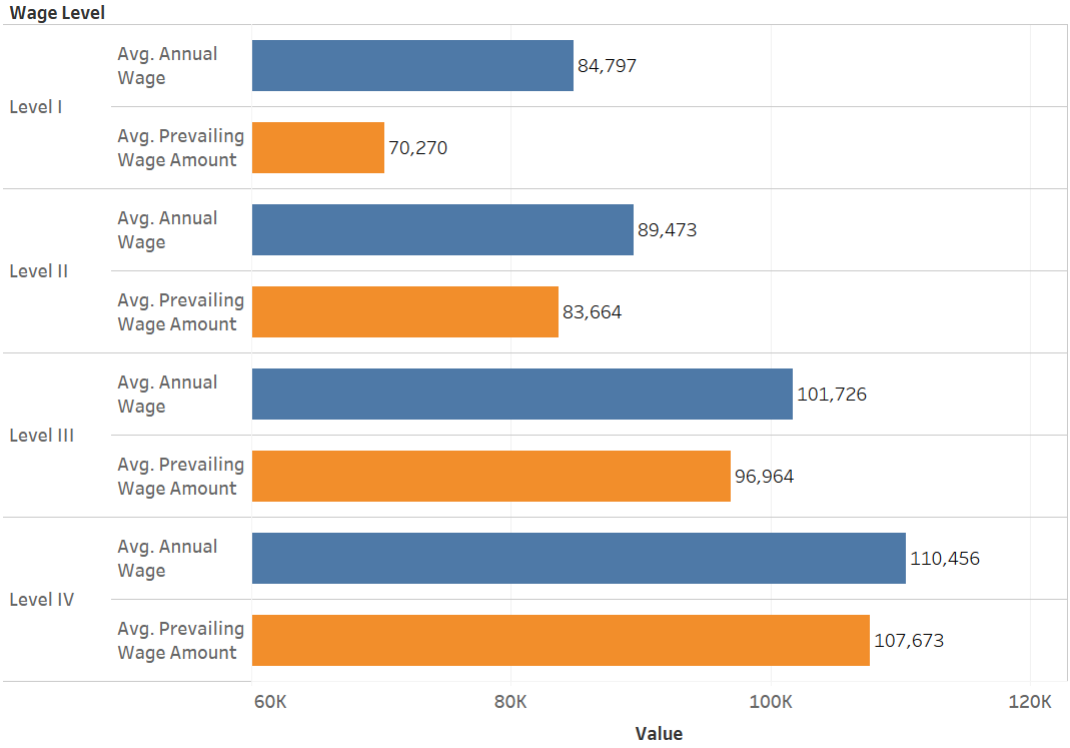

Figure 7: Average Prevailing Wages and Received Wages by Prevailing Wage Level

Figure 7 shows the same information as Figure 6, but in US Dollars. According to Figure 7, the wage premium at level 1 is $14,427, while the wage premium at level 4 is $2,783. Further, the overall jump in actual wages received between wage level 1 and wage level 2 is only $4,676, compared to considerable increases of $12,247 and $8,730 between wage levels 2-3 and levels 3-4. This observation may indicate that companies are less likely to see significant distinction in ability between workers at the first two levels compared to workers at level 3 or 4.

5 Empirical Results

5.1 Regression

Table 8 presents the final regression results from estimating the equation in Figure 4. The dependent variable is the difference between the log offered wage and log market wage per position. This gap is the wage premium. Transforming the wage premium into a logged value for the model means that coefficients associated with the independent variables must be interpreted in terms of percent changes instead of dollar changes. For example, a coefficient of .1 on variable $\beta 1$ would be interpreted as a 1 unit change in $\beta 1$; holding all else constant, resulting in a 10% increase in wage premium.

The estimates in the first Column include wage premium regressed on prevailing wage levels. This limited approach shows a negative relationship between prevailing wage levels and the wage premium. For example, being hired for a job with a prevailing wage level designation of 2 is associated with a wage premium that is, on average, 12.7% lower compared to an individual hired at prevailing wage level 1. In this simple model, the three wage level variables are significant at $p < .001$. Additionally, it is interesting to note that all coefficients are negative and the coefficients increase as the prevailing wage levels increase.

The estimation results in Column 2 only consider the highest level of education achieved. Education is commonly considered a key factor during the hiring process, and higher levels of educational achievement are typically correlated positively with an increased salary. For this specification, the reference category is the bachelor's degree and the coefficients on master's and doctorate degree are significant at $p < .001$. According to this model, there is a small decrease in the wage premium for master's degree holders of 1.13% compared to bachelor's degree holders, regardless of prevailing wage level. In contrast, there is a relatively large increase in the wage premium for doctorate degree holders of 3.28% compared to the bachelor's degree.

Table 8: Primary Estimation of the Impact of Experience on Wage Premium

	(1)	(2)	(3)	(4)	(5)
Prevailing Wage Level 2	-0.127***		-0.124***	-0.134***	-0.129***
	(-24.00)		(-23.09)	(-19.05)	(-18.19)
Prevailing Wage Level 3	-0.170***		-0.169***	-0.178***	-0.170***
	(-31.43)		(-30.86)	(-25.45)	(-23.95)
Prevailing Wage Level 4	-0.192***		-0.192***	-0.206***	-0.197***
	(-36.40)		(-36.43)	(-32.85)	(-30.10)
Masters Degree		-0.0113***	-0.00792**	-0.0464***	-0.0287**
		(-4.50)	(-3.20)	(-4.31)	(-2.65)
Doctorate Degree		0.0328***	0.0372***	0.0584	0.0792
		(4.57)	(5.28)	(1.05)	(1.22)
Masters Degree and Level II				0.0385***	0.0371**
				(3.32)	(3.22)
Masters Degree and Level III				0.0378**	0.0435***
				(3.24)	(3.78)
Masters Degree and Level IV				0.0524***	0.0451***
				(4.59)	(3.99)
Doctorate Degree and Level II				-0.0197	-0.0410
				(-0.35)	(-0.63)
Doctorate Degree and Level III				-0.0250	-0.0521
				(-0.44)	(-0.79)
Doctorate Degree and Level IV				-0.0228	-0.0625
				(-0.37)	(-0.90)
Years Since Education Complete					0.00751***
					(8.01)
Years Since Education Complete^2					-0.000205***
					(-5.81)
Indian Citizen					-0.0502***
					(-14.97)
Chinese Citizen					-0.0295***
					(-6.25)
Company Under 100 Employees					-0.0604***
					(-21.38)
Company with 100 to 999 Employees					-0.0330***
					(-11.28)
Company between 1000 and 9999 Employees					0.0118***
					(3.83)
Education In the US					-0.00379
					(-1.17)
Constant	0.260***	0.126***	0.261***	0.271***	0.264***
	(51.97)	(61.50)	(51.76)	(45.65)	(35.89)
Observations	13386	13386	13386	13386	13382
Adjusted R^2	0.150	0.004	0.154	0.156	0.220

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Column 3 combines the variables in the first two estimations with minimal changes in the overall results. The change in wage premium for individuals holding a master's degree as compared to a bachelor's degree decreases to a negligible -.792%, which is significant at $p < .01$, compared to $p < .001$ in Column 2. This regression indicates that the negative coefficient results from Column #1 were not a result of omitting educational attainment. Additionally, in Column 3, all variable coefficients maintained the same sign they carried in the first two iterations of the model. The wage premium for holding a doctorate degree increased slightly to 3.72%.

Column 4 begins to add layers of complexity. It includes a series of interaction variables between prevailing wage levels and highest degree obtained. The hypothesis for including these variables is that the impact of prevailing wage levels on wage premiums varies for each level of education. For example, the net change in wage premium between master's degree level 1 and level 2 is going to be different than the net change between bachelor's degree level 1 and level 2.

The most interesting observation from Column 4 is that the coefficients for both doctorate degree and the interaction terms including doctorate degree are not significant. Interpreted literally, this shows that doctorate degree holders neither benefit nor receive harm from their advanced degree in terms of the wage premium when compared to holders of a bachelor's degree. In contrast, the interaction terms for master's degree holders are significant and positive, indicating that there is an additional benefit to holding a master's degree at each wage level. For example, a master's degree candidate hired for a level 4 positions would receive a wage premium .6% higher than a bachelor's degree candidate hired for the same position. The formula for each of these examples can be seen in Figure 8.

The coefficients associated with each prevailing wage level continue to show significant negative correlation between increases in prevailing wage levels and the wage premium. The positive coefficients on the master's degree interactions do not offset the decrease

Level 4 with Masters Degree:
$Lgdiffpay_i = .271 - .206(PW\_Level\_4) - .0464(Masters) + .0524(Masters\_Level\_4) = .072$

Level 4 with Bachelors Degree:
$Lgdiffpay_i = .271 - .206(PW\_Level\_4) = .066$

Wage difference: $.072 - .066 = .006$

Figure 8: Difference in Earnings at Prevailing Wage Level 4

in wage premium associated with each prevailing wage level.

The final iteration in Column 5 is an estimation of the full equation and includes a series of control variables to remove additional variance from the model. These additional variables control for company size, education location, and Indian or Chinese citizenship. Additionally, the variable "Years Since Education Complete" is a proxy for age because that information is not included in the data set. A squared version of this term is also included due to the assumption that the relationship between age and wage premium is non-linear. The addition of the control variables impact the coefficients on the variables already included in the model, but do not impact the significance of the doctorate interaction terms or the negative correlation pattern between wage levels and wage premium. Additionally, the final equation has a robust adjusted R^2 of .22 compared to an adjusted R^2 of .156 in Column 4.

In addition to this regression anaylsis, the results of two fixed effects regressions can be seen in the Appendix. The table contains the final regression equation from Column 5 in Table 8, as well as the final regression equation with fixed effects for "state where the job is located" (Column 2) and "immigrant country of origin" (Column 3). In the country of origin model, the variables for Indian Citizen and Chinese Citizen drop out due to collinearity.

The fixed effects approaches did not improve on the final regression result from Table 8, and in both cases resulted in decreases of the adjusted R^2 values. The lack

of significance from the fixed effects models shows that the results from the original regression were not due to improper grouping of the data. Despite no improvement in the overall model, both fixed effect models had strong impacts on the significance of the doctorate variable. The P-value on this variable moves from .22 in the final estimation of the main regression to .08 when considering fixed effects for state or work, and improves further to .051 when including fixed effects for country of origin.

6 Discussion

The significant and negative coefficients associated with the prevailing wage level variables indicate a negative correlation between experience and wage premium. Interpreting these results in terms of supply and demand, the data indicates that there is relatively more demand for individuals with less work experience, compared to workers with higher levels of experience. Thus, workers with less experience are commanding a much higher wage premium in comparison to their counterparts, who have been working or studying for a longer period of time. As a caveat, it is important to recognize that limited work experience is not associated with worker ability. Work experience relates to how long an individual has been working generally and in a specific field. In contrast, ability is inherent. Overall, these results are counter-intuitive and provide a strong basis for further study and discussion.

The finding that individuals are being paid significantly above the market wage for a position at prevailing wage level 1 is not surprising. The EB visa process aims to provide visas to individuals who are above average to exceptional for positions that cannot be filled by a domestic worker. As a result, the expectation should be that these individuals are paid higher than the average market wage, because the market wage technically represents a worker of average skill. At the same time, the limited bargaining power of these workers means the wages they do receive may not indicative

of their actual value in the economy. What is surprising is that the trend of paying significantly above market wage does not continue throughout prevailing wage levels. There are no indications in the data that would provide a rationale for why workers at designations 2-4 receive increasingly smaller wage premiums.

One possible explanation for the negative correlation in prevailing wage levels is the specific nature of the IT industry. For example, Mark Zuckerburg has publically stated that he believes younger people are smarter (Coker, 2007) and plastic surgery has become common for people in Silicon Valley as young as 40 in an attempt to look 20 (Scheiber, 2014). Recruiters are less likely to send 'older' workers to technology company interviews because they know tech companies do not believe these workers would be up to date on the latest technology (Johnston, 2016). This bias towards younger workers could explain the pattern observed in the data. IT companies constantly searching for young workers may result in increased demand for those with the least experience, while decreasing demand for workers with longer resumes or advanced degrees.

A flaw in this argument is that the pattern is consistent across degrees. At the time of graduation, advanced degree holders are almost always older than bachelor's degree holders because of the time it takes to earn the respective degrees. For example, if an 18-year-old student attends a four-year college they will graduate at age 22. If that same student went directly to graduate school they could finish anywhere from 24 to 30 years of age. If age is truly the primary driver of demand, then inexperienced doctorate degree holders should not be commanding the same wage premium as inexperienced bachelor's degree holders. However, the data shows that this is occurring, indicting that it may be an actual lack of work experience, not age, in which the IT companies are most interested.

Another approach to understanding the regression results is through signaling. Deidda and Paolini's (2012) paper used signaling theory to show that increases in the price of college and post-graduate education can distort the education signal. If the

price of higher education becomes too great, it reduces the pool of skilled workers who can achieve advanced degrees and send a signal to companies that they are desirable workers. This leads to the creation of a "skilled-rich" group of workers at the top and an intermediate group of "skilled-poor" and "unskilled-rich." If the group of skilled workers at the top is not large enough to satisfy industry demand for skilled workers, companies may be forced to look to other groups. While firms could hire out of the intermediate group, they will likely encounter a high degree of worker productivity variance. The costs of hiring from this intermediate group may then become untenable, as companies either bring on more workers to accomplish fewer tasks, or cycle through workers in search of a highly productive employee.

In this situation, it is possible companies would look for an alternative hiring pool to satisfy their demands. EB-workers send a productivity signal to the firm that may mimic that of the "skilled-rich" group. The vast majority of EB workers are already in the country on an H-1B or L-1 visa, and have a demonstrated body of work. Further, as was discussed earlier in the paper, there have been ample studies showing that the traits correlated with deciding to immigrate are also correlated with success in the workplace. Once companies have hired the maximum number of workers from the "skilled-rich" domestic group, the firms could turn to the EB visa pool in search of long-term, highly productive workers, before hiring from the intermediate pool with high variance. However, the yearly cap on EB workers of 80,000 means that there may not be enough availability of foreign workers to satisfy employer demand. This supply-demand mismatch can help explain the above-market wages being paid to EB workers.

Overall, the regression results and the theories presented do not affirm or reject the hypothesis originally put forth. Company willingness to pay a significant wage premium for less experienced workers indicates that these workers may be more productive than domestic workers with similar work experience. However, the traits that would confirm that increased level of productivity have so far not been observed

An alternative explanation is that the productivity gap between EB workers and domestic workers varies with experience level. For example, at prevailing wage level 1 the productivity gain resulting from hiring an EB worker may be significant when compared to a domestic worker. However, the productivity gain from hiring an EB worker at prevailing wage level 4 and a comparably experienced domestic worker may be smaller. If companies recognize this pattern, it would indicate an increased level of competition for foreign workers with less work experience because the productivity gains significantly higher. Additionally, if the reverse is true for workers at prevailing wage level 4, companies may be less willing to pay large wage premiums because the productivity loss from having to hire a domestic worker is not as significant.

7 Policy Implications

The regression results indicating unsatisfied demand for skilled-labor have significant policy implications across multiple areas. These results could be used to make an argument for increasing the number of skilled international workers allowed into the US on a permanent basis. A shortage of skilled labor implies that increasing the number of workers on EB visas would not result in job losses for US workers. If companies are able to fill these positions, the spillover effect may result in overall company growth that would further increase hiring. Moreover, the backlog of applications for EB visas clearly indicates that there is sufficient global supply to fill these positions. If US-based IT companies are able to locate talent but unable to hire due to immigration laws, it increases the likelihood that the company would set up operations overseas [7]. In that case, it may make more sense for an IT company to set-up or expand an office in Bangalore, India than to operate in the US with insufficient skilled labor.

On the other hand, these results could be used by the government to justify further

[7] see:Trump and Sessions plan to restrict highly skilled foreign workers. Hyderabad says to bring it on - Washington Post, 1/8/2017

investment in IT worker training programs and more ambitious initiatives such as nationwide broadband access [8]. Additionally, the results point to an area of future need and provide a rationale to begin teaching computer coding to students prior to college. Currently, computer coding is taught in some private and well-funded public schools but is not common in the national public school system (Kohli, 2015).

At a more nuanced level, the analysis of the results may point to an inability of skilled workers to be able to afford the schooling necessary to obtain IT sector jobs. The rapidly increasing costs of higher education and the corresponding increase in student debt has been studied ad-nauseum. If this is the case, it would lend support to regulating the costs of public universities, increasing oversight of non-government student loan providers and/or developing a new approach to higher education that would lower prices. From the perspective of higher education, an alternative to the current approach could be a more targeted education system where students determine their area of study before enrolling. This approach would significantly limit the ability to explore different academic areas, but would also decrease the number of classes each student is required to take and would make students more attractive to the industry associated with their area of focus.

The government could also concoct innovative new ways of issuing student loan debt that incentivize students to pursue degrees in areas of high demand. For example, student loan rates could be adjustable based on area of study to account for the level of risk associated with obtaining a job in a particular field after graduation. Based on the data in this analysis, students who pursue studies relevant to the IT industry would be eligible for a lower rate on their student loans compared to students majoring in a less in-demand field. Similar to the targeted academic approach, the downside to this sort of action is that it may discourage students from pursuing a liberal-arts education. At the same time, it does not prevent a student from doing so. Instead, it highlights the risks associated with taking on significant student loan debt and pursuing a career in a

[8] see: FCC plan Connecting America: The National Broadband Plan, released March 16, 2010

low-demand field.

8 Thesis Limitations

The estimates of the regression analysis are only applicable to a subset of workers who are being sponsored for EB-2 or EB-3 visas. The requirements for obtaining this type of visa mean that the results are not generalizable to other visa types within the EB family, or outside of it. Additionally, the model estimation itself is limited by the exclusion of several key variables that could impact the results. Specifically, it is not possible to tell if a worker is being considered for an EB-2 or EB-3 visa. There is the possibility that the pattern observed in this data is a result of conflating the two groups. Age and sex are two other variables that have been omitted from the dataset but would be beneficial to include.

9 Conclusion

The model presented in this paper indicates that prevailing wage designations in the EB-2 and EB-3 hiring process carry a significant amount of weight in determining a sponsored employee's wage premium. The finding is counterintuitive, in the sense that it indicates a wage penalty for being more experienced. Further research is needed to fully understand the mechanisms at work. In particular, a field study that included interviews with members of the IT community, and EB workers, would be valuable in understanding the internal mechanisms of this process.

10 Appendix

EB Workers Education Levels by Prevailing Wage Designation

	Level I Count	Level II Count	Level III Count	Level IV Count	Total Count
Bachelors	951	1389	890	2063	5293
Masters	324	4401	1860	1049	7634
Doctorate	8	285	132	36	461
Total	1283	6075	2882	3148	13388

EB Workers Previous Visa Class

	Count
B-1	1
B-2	2
E-1	6
E-2	10
E-3	27
F-1	286
F-2	1
G-4	1
H-1A	3
H-1B	11910
H-1B1	12
H-4	19
J-1	9
L-1	718
L-2	17
Not in USA	27
O-1	7
Parolee	88
TN	128
Total	13272

Size of Hiring Companies

	Count
Small Company	2645
Small-Medium Sized Company	2792
Medium Company	2947
Large Company	4384
Total	12768

EB Workers Top 20 US Job Location

	Count
CALIFORNIA	4293
NEW JERSEY	1085
WASHINGTON	1008
NEW YORK	929
ILLINOIS	912
TEXAS	725
MASSACHUSETTS	576
MICHIGAN	532
GEORGIA	461
VIRGINIA	321
OHIO	277
FLORIDA	273
NORTH CAROLINA	220
PENNSYLVANIA	203
WISCONSIN	167
CONNECTICUT	143
COLORADO	133
ARIZONA	114
MARYLAND	109
OREGON	98

Fixed Effects Regression

	No FE	State FE	Country FE
Prevailing Wage Level 2	-0.129***	-0.122***	-0.130***
	(-18.19)	(-23.44)	(-24.69)
Prevailing Wage Level 3	-0.170***	-0.168***	-0.171***
	(-23.95)	(-28.93)	(-29.04)
Prevailing Wage Level 4	-0.197***	-0.195***	-0.199***
	(-30.10)	(-38.78)	(-38.79)
Masters Degree	-0.0287**	-0.0255**	-0.0277***
	(-2.65)	(-3.25)	(-3.47)
Doctorate Degree	0.0792	0.0726	0.0835
	(1.22)	(1.72)	(1.95)
Masters Degree and Level II	0.0371**	0.0285***	0.0345***
	(3.22)	(3.31)	(3.96)
Masters Degree and Level III	0.0435***	0.0431***	0.0406***
	(3.78)	(4.72)	(4.38)
Masters Degree and Level IV	0.0451***	0.0424***	0.0424***
	(3.99)	(4.74)	(4.67)
Doctorate Degree and Level II	-0.0410	-0.0388	-0.0467
	(-0.63)	(-0.91)	(-1.08)
Doctorate Degree and Level III	-0.0521	-0.0369	-0.0567
	(-0.79)	(-0.85)	(-1.28)
Doctorate Degree and Level IV	-0.0625	-0.0582	-0.0683
	(-0.90)	(-1.25)	(-1.44)
Years Since Education Complete	0.00751***	0.00833***	0.00807***
	(8.01)	(9.29)	(8.95)
$YearsSinceEducationComplete^2$	-0.000205***	-0.000221***	-0.000234***
	(-5.81)	(-6.60)	(-6.90)
Indian Citizen	-0.0502***	-0.0379***	0
	(-14.97)	(-12.76)	(.)
Chinese Citizen	-0.0295***	-0.0289***	0
	(-6.25)	(-7.04)	(.)
Company Under 100 Employees	-0.0604***	-0.0412***	-0.0575***
	(-21.38)	(-12.95)	(-19.06)
Company with 100 to 999 Employees	-0.0330***	-0.0154***	-0.0305***
	(-11.28)	(-4.99)	(-10.41)
Company between 1000 and 9999 Employees	0.0118***	0.0212***	0.0131***
	(3.83)	(7.27)	(4.64)
Education Inside the US	-0.00379	-0.00421	0.00218
	(-1.17)	(-1.41)	(0.70)
Constant	0.264***	0.237***	0.222***
	(35.89)	(36.49)	(33.39)
Observations	13382	13382	13382
Adjusted R^2	0.220	0.180	0.174

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Variables

- Lgdiffpay - This is the dependent variable for the model and it represents the difference between the log of prevailing wage for a position as determined by the DoL, and the log of the offered wage for the position by the sponsoring company (lgdiffpay = Lgofferedwage - Lgprevailingwage)
- Bachelors (dummy) - Level of education is critical to understanding working qualification and prevailing wage determination. Additionally, the vast majority of jobs in the IT sector require at least a Bachelors degree.
- Masters (dummy) - Level of education is critical to understanding working qualification and prevailing wage determination. Masters degree is considered as the comparator for bachelors because it is the only other degree of meaningful size in the data set (doctorate, associates and high school diploma exists in small sample sizes)
- Level_2 (dummy) - Level_2 variable indicates that the company is sponsoring the individual at the prevailing wage level 2 designation
- Level_3 (dummy) - Level_3 variable indicates that the company is sponsoring the individual at the prevailing wage level 3 designation
- Level_4 (dummy) - Level_4 variable indicates that the company is sponsoring the individual at the prevailing wage level 4 designation
- Level2b (interaction) - This variable is an interaction between the prevailing wage level 2 designation and having a bachelor degree. It is included based on the hypothesis that educational attainment and prevailing wage levels do not have independent effects on the dependent variable
- Level2b (interaction) - This variable is an interaction between the prevailing wage level 3 designation and having a bachelor degree. It is included based on the hypothesis that educational attainment and prevailing wage levels do not have independent effects on the dependent variable
- Level2b (interaction) - This variable is an interaction between the prevailing wage level 4 designation and having a bachelor degree. It is included based on the hypothesis that educational attainment and prevailing wage levels do not have independent effects on the dependent variable
- Years_Out - The years_out variable serves as a proxy for age, which is not available in the dataset. This variable is determined by subtracting the year that an individual's last level of education was completed from the current year. The hypothesis for including this variable is that workers who graduated more recently would have less experience and would receive lower wages.

Variables

- Sqyears_out^2 is the square of years_out and is included for functional form reasons under the belief that there is not a linear relationship between years removed from graduation and difference in pay.
- Indian Citizen - Indian citizens make up the largest portion of the dataset and are particularly skilled in the IT sector, not controlling for this characteristic has the potential to bias the results.
- Chinese Citizen - Chinese citizens make up the second largest group in the dataset and are also particularly skilled in the IT sector, not controlling for this characteristic has the potential to bias the results
- Companies Smaller than 100 Employees - Company size is directly relevant to their ability to pay employees. Smaller companies may not possess the resources to pay at, or above, market rate to obtain the best talent and must persuade job candidates with other forms of compensation
- Company with 100 to 999 Employees - Companies of this size, typically referred to as Small-Medium Size Businesses or SMBs, likely have greater flexibility when offering wages but still like the financial capabilities of larger firms.
- Company with 1000 to 9999 Employees - "Medium" companies should have significant flexibility when making wage offers, however, it is likely still less than large companies
- Company with 10000+ Employees - Companies of these size are able to pay for the best talent. As a result, they have significant potential to bias the results by overpaying job candidates to ensure that a position is filled.
- Education Inside the US - Companies may place greater value on a undergraduate or graduate degree from a US institution in comparison to a degree obtained abroad.

11 References

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