Group 10

Publicly Listed Companies and the Presence of H1B Workers

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Introduction

The purpose of our research is to investigate the relationship between publicly listed companies' financial characteristics and their usage of the H-1B visa program. We draw primarily from the yFinance package for stock data and the USCIS visa database for immigration records. We examine broader employment trends within the S&P 500, identifying whether certain sectors rely more heavily on immigrant labor. These datasets allow us to analyze how visa approvals correlate with industry type, market performance, and broader economic cycles.

While our broader investigation revealed useful patterns, our specific analysis of financial indicators did not show any statistically significant differences in the means between companies that hire H1B workers and those that do not. However, we observed distinctive sectoral patterns among companies employing H-1B visa holders.

Data Wrangling

We collected data from multiple reliable sources, including EDGAR (the SEC's Electronic Data Gathering, Analysis, and Retrieval system), USCIS, and Yahoo Finance. From EDGAR, we obtained a list of publicly listed companies and their stock tickers.

A major challenge was that the USCIS data only included the last four digits of each employer's tax ID, making it impossible to reliably match companies using tax information alone. As a result, we relied exclusively on employer names to perform the merge. This made company name inconsistencies, such as legal suffixes and spelling variations, the primary barrier to accurate matching. For example, while Amazon Inc. is the publicly listed company, visa petitions might reference Amazon Web Services separately, making it non-obvious that they should be treated as the same company.

Initially, we explored approximate string matching using the FuzzyWuzzy package. However, given the large number of public companies, FuzzyWuzzy frequently returned close but inaccurate matches, leading to severe overestimation of visa petition links. To prioritize precision over recall, we abandoned this method and developed a custom cleaning function to standardize company names which removed legal and descriptive terms, replaced special characters, standardized spacing, and converted everything to uppercase. Only exact matches after cleaning were accepted. This decision greatly reduced false positives, but it also introduced the risk of missing real matches when slight name discrepancies remained.

We manually corrected known exceptions where standardized cleaning alone was insufficient. For instance, petitions for Facebook needed to be explicitly mapped to Meta Platforms after the company's corporate rebranding. While manual corrections improved accuracy for major employers, they also introduced potential bias by better capturing well-known companies while underrepresenting smaller firms. As a result, the final dataset is well suited for analyzing major corporate trends but may not fully represent the broader universe of H-1B petitioners.

Each company had multiple visa petitions per year, sometimes with minor variations even after cleaning. To address this, we grouped records by fiscal year and ticker symbol, summarized location attributes by taking the most common value, and aggregated visa counts by summation. This aggregation step made the data suitable for company-level analysis but removed some detailed variation between different branches of the same company.

For stock price data, we chose yFinance to download prices from January 1, 2020, to March 16, 2025, saving the results to a CSV file to avoid lengthy repeated download times. One technical challenge involved an IP ban from Yahoo Finance due to multithreading during data pulls, which we resolved by submitting an unban request and introducing delays between requests. If stock information was unavailable for a company, we built an alert system to log missing cases. Finally, we collected company-level financial information using the .info() function in yFinance, including metrics such as audit risk, beta, forward P/E ratio, etc. As with price data, this process was time-intensive, so we saved the resulting dataset to a separate CSV file.

H1B Visa Data Patterns

Figures 1.1 and 1.2 illustrate the geographic distribution of the top 20 H-1B visa employers across the United States. As shown in Figure 1.1, these employers are heavily concentrated in coastal and metropolitan areas, particularly California, New York, Washington, and New Jersey. These regions are home to large corporations, especially in the technology and financial sectors, which are frequent sponsors of H-1B visa holders. The clustering of major employers in specific cities highlights the uneven distribution of immigrant employment, suggesting that demand for specialized foreign labor is strongest in technical, engineering, and corporate roles within key urban hubs.

Figure 1.1

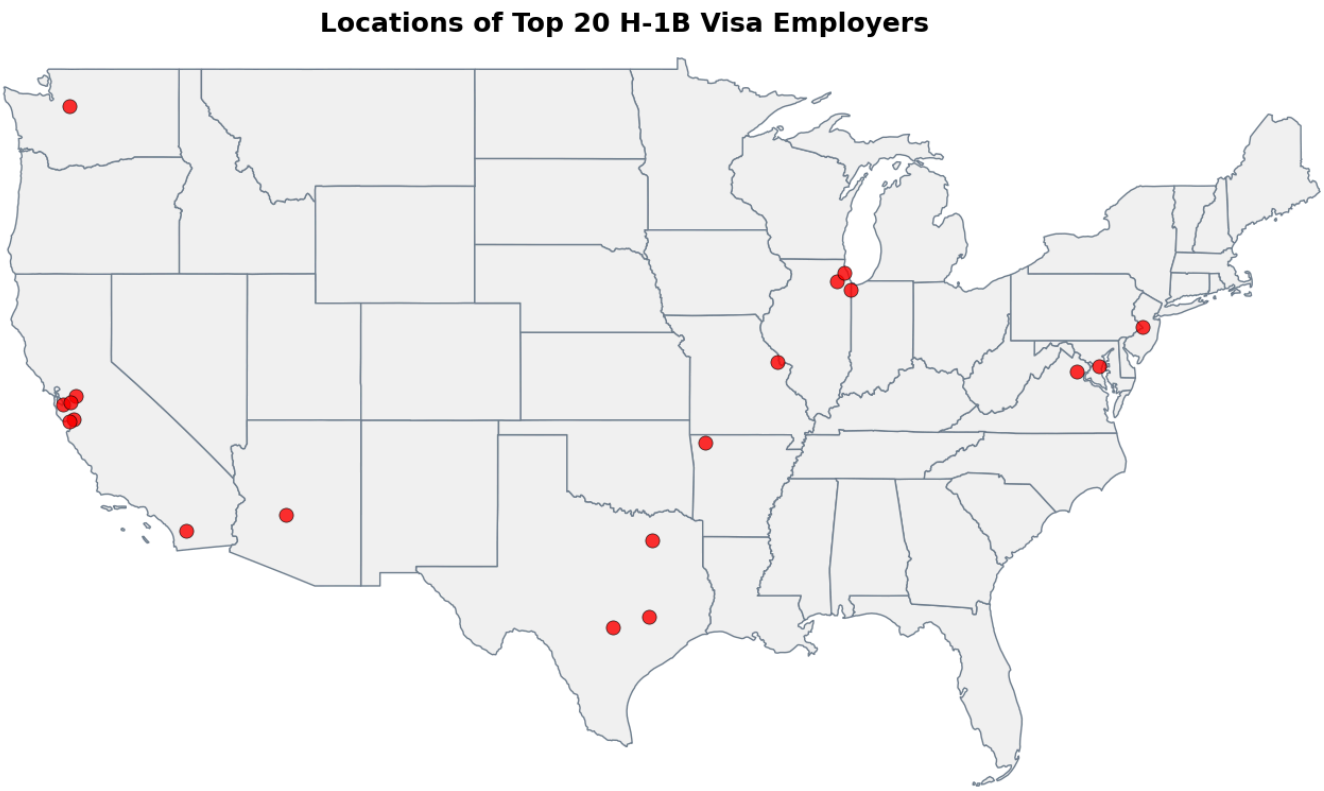
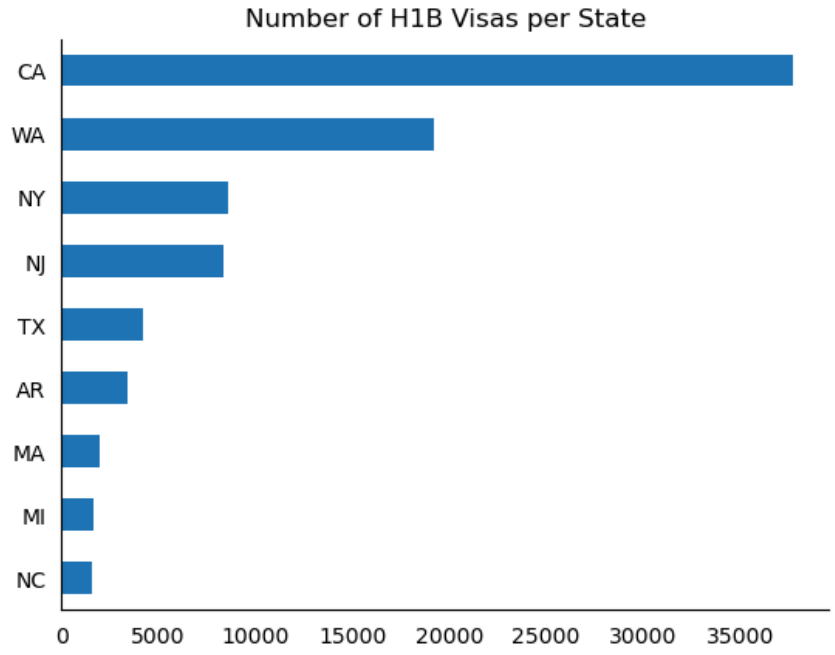
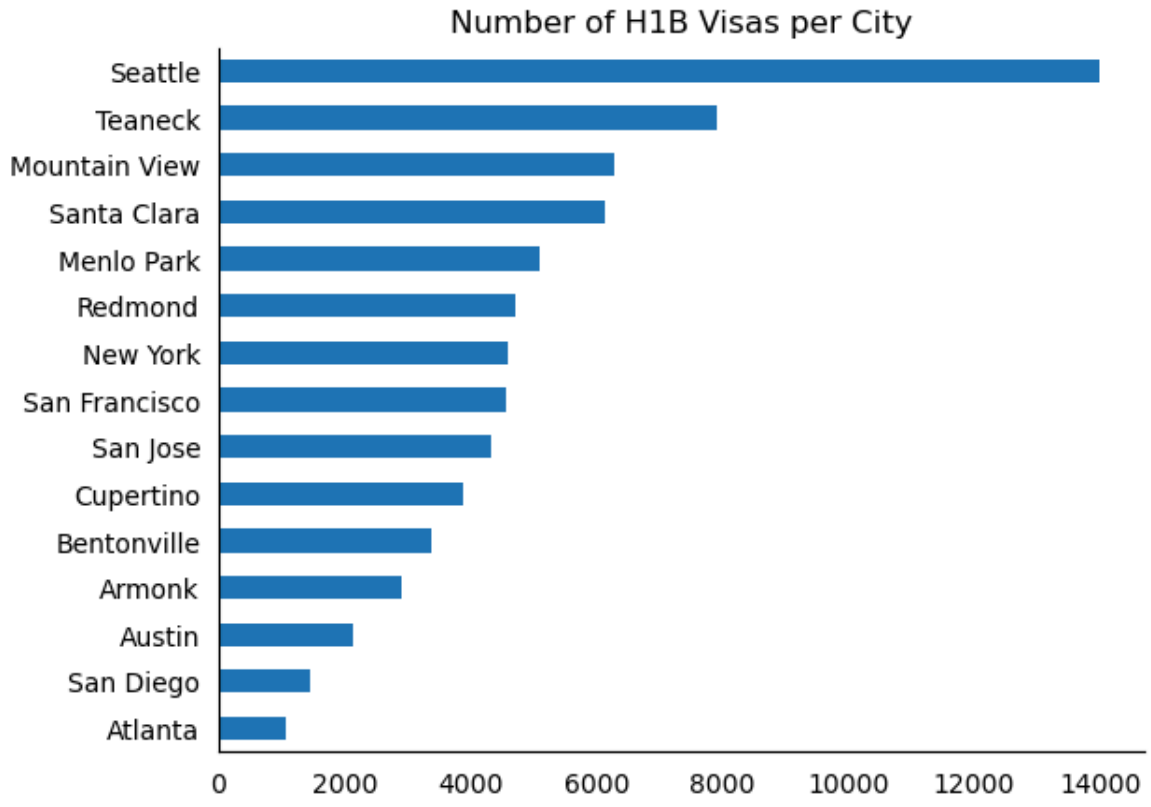


Figure 1.2



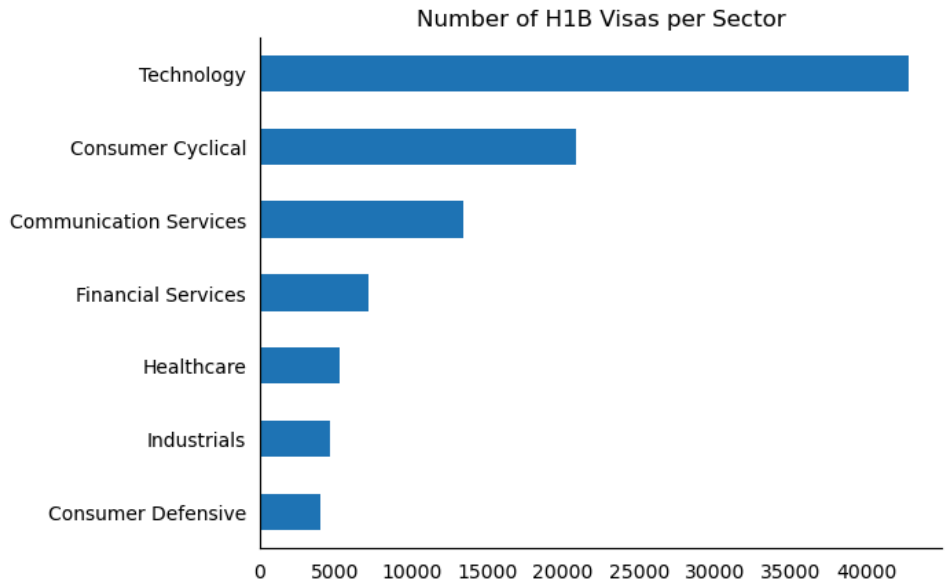
A city-level breakdown of visa activity follows similar patterns. Figure 1.3 illustrates that sponsorship is highly concentrated in a small number of cities, with Seattle leading, followed by Teaneck, Mountain View, and Santa Clara. These cities host major technology companies and consulting firms, reinforcing the strong connection between tech hubs and H-1B visa usage.

Figure 1.3



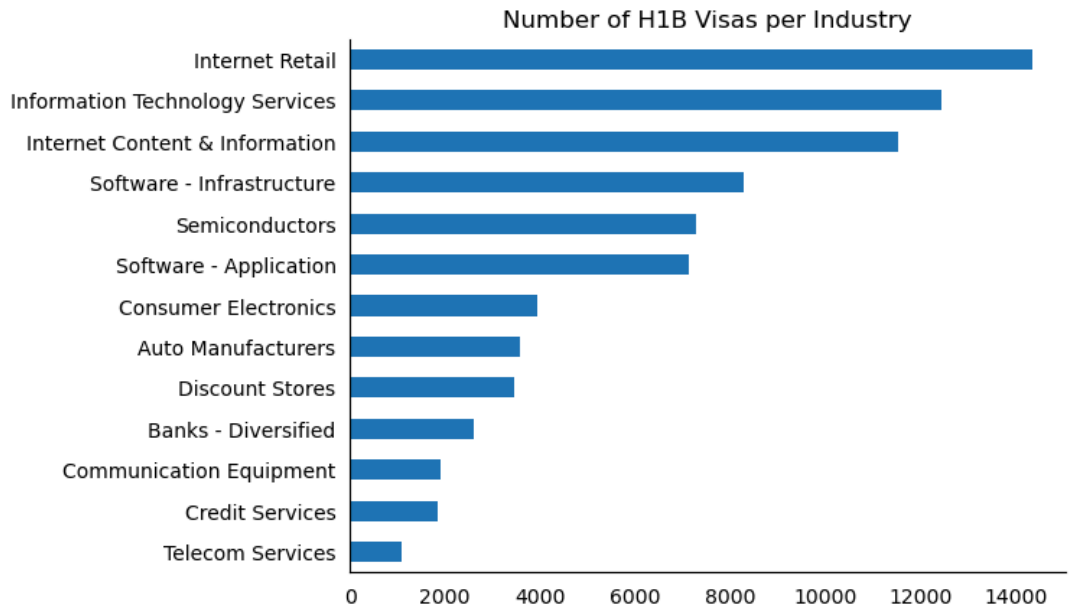
We also analyzed H-1B visa sponsorship across major sectors. Figure 1.4 displays that the technology sector accounted for the highest number of visa petitions by a substantial margin, indicating that technology firms are the primary drivers of demand for specialized foreign labor. Other sectors, including consumer services and communication services, also sponsor significant numbers of H-1B workers. This suggests that jobs in technology and related fields are the most likely to need workers from outside the US, especially for roles that require special training or education.

Figure 1.4



Breaking the data down further by industry, Figure 1.5 exhibits how internet retail and IT services emerge as the industries employing the highest numbers of H-1B workers. Other technology-related industries, such as internet content providers and software development firms, also report substantial sponsorship levels. Overall, companies engaged in digital commerce, software engineering, and technology infrastructure management appear to rely most heavily on skilled immigrant labor, particularly for roles focused on coding, software systems, and large-scale digital operations.

Figure 1.5



Analysis of Publicly Listed Companies

One hypothesis we pursued is that companies employing H-1B visa holders are willing to invest more resources to secure specialized talent, suggesting stronger current performance and a more favorable future outlook. If this theory holds, we would expect key financial indicators to improve as the number of H-1B employees increases.

Figure 2.1 compares the forward price-to-earnings (P/E) ratio with the number of H-1B employees among companies with fewer than 100 visa holders. We observe a gradual increase in the forward P/E ratio as H-1B counts rise. A higher forward P/E ratio typically reflects stronger investor expectations for future earnings growth, suggesting that companies with more H-1B employees are perceived as having better growth prospects.

Figure 2.1

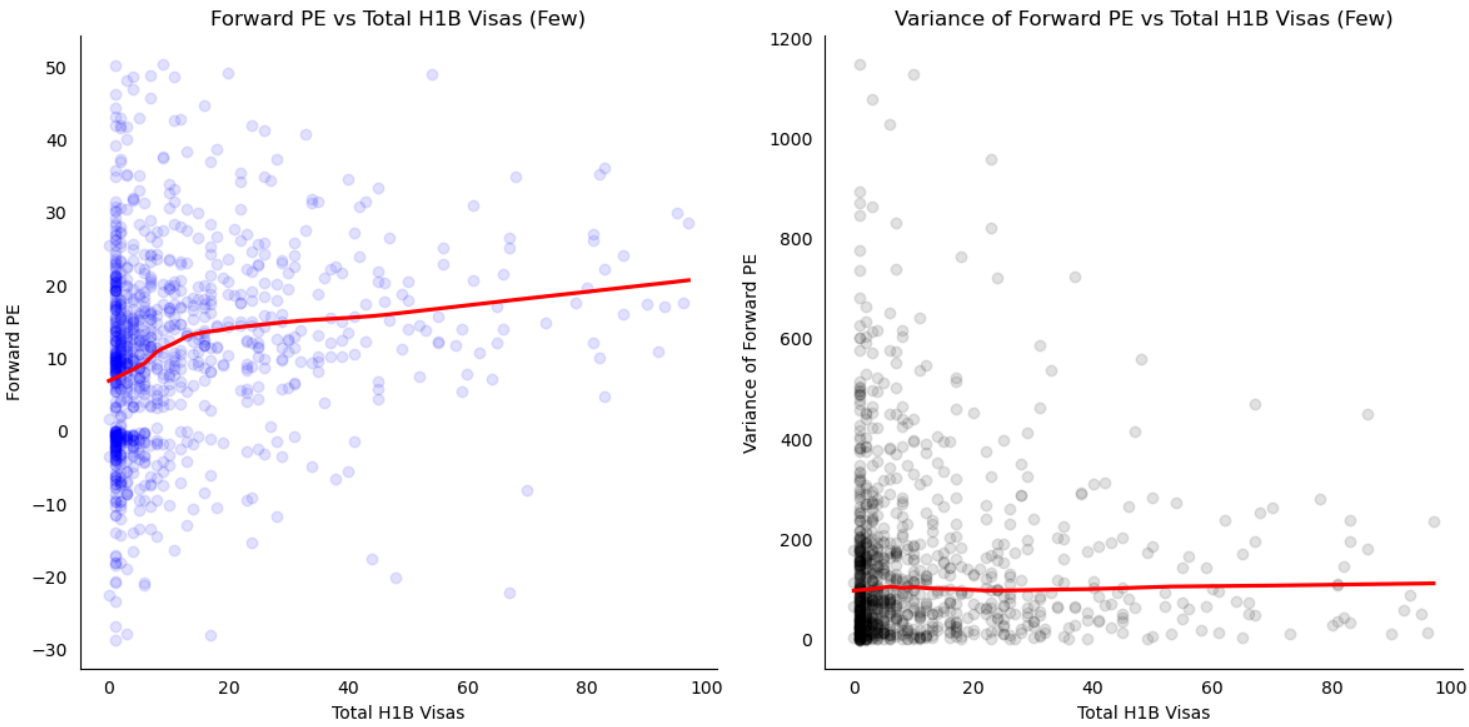


Figure 2.2 examines profit margins relative to the number of H-1B employees. The positive trend among companies with few H-1B holders indicates that firms employing more specialized workers tend to maintain healthier margins, reinforcing the idea that these companies may present stronger investment opportunities.

Figure 2.2

Similarly, Figure 2.3 shows a decreasing short interest ratio as the number of H-1B employees increases. A lower short ratio implies that fewer investors are betting against the company's stock performance, suggesting greater market confidence in firms that hire more H-1B workers.

Figure 2.3

Finally, Figures 2.4 presents stock price trends from 2020 to 2025, categorized by H-1B sponsorship status. On average, companies with H1B employees tend to trade at higher prices compared to companies without H1B employees. Figure 2.5 further distinguishes among H-1B employers by comparing companies with either fewer and more than one hundred visa holders. On average, companies with over one hundred H1B employees trade at a higher price than companies with less than one hundred H1B employees.

Figure 2.4

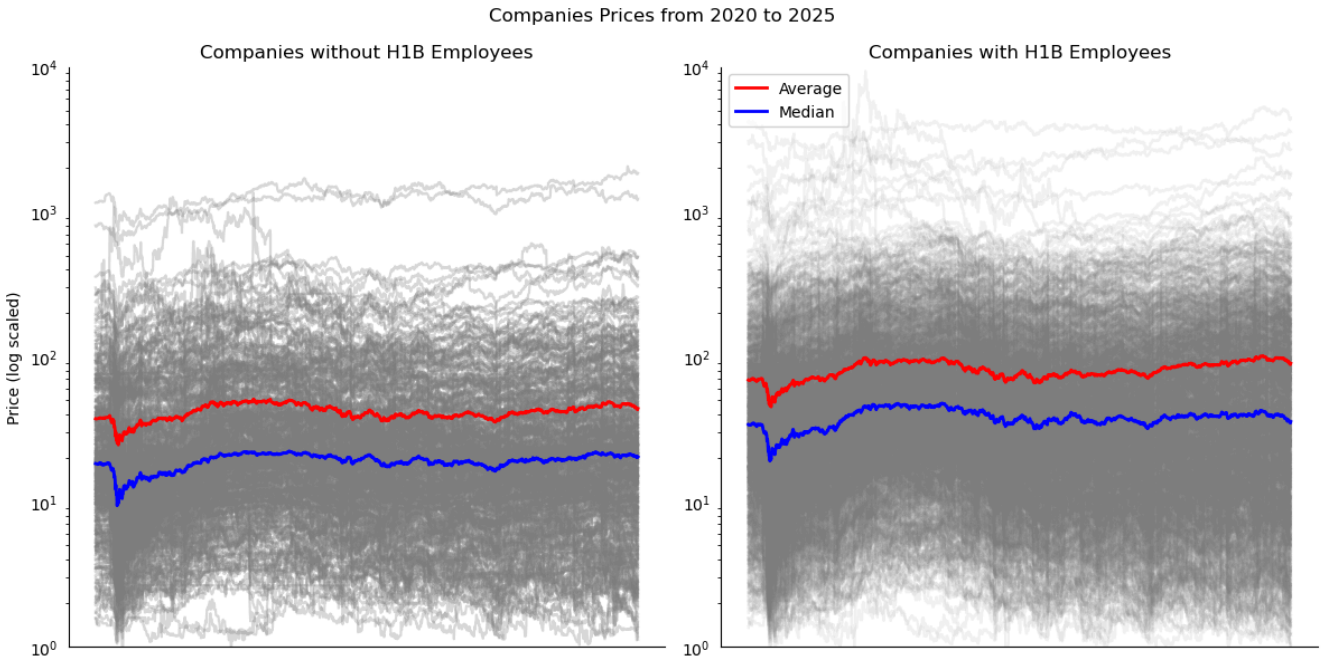
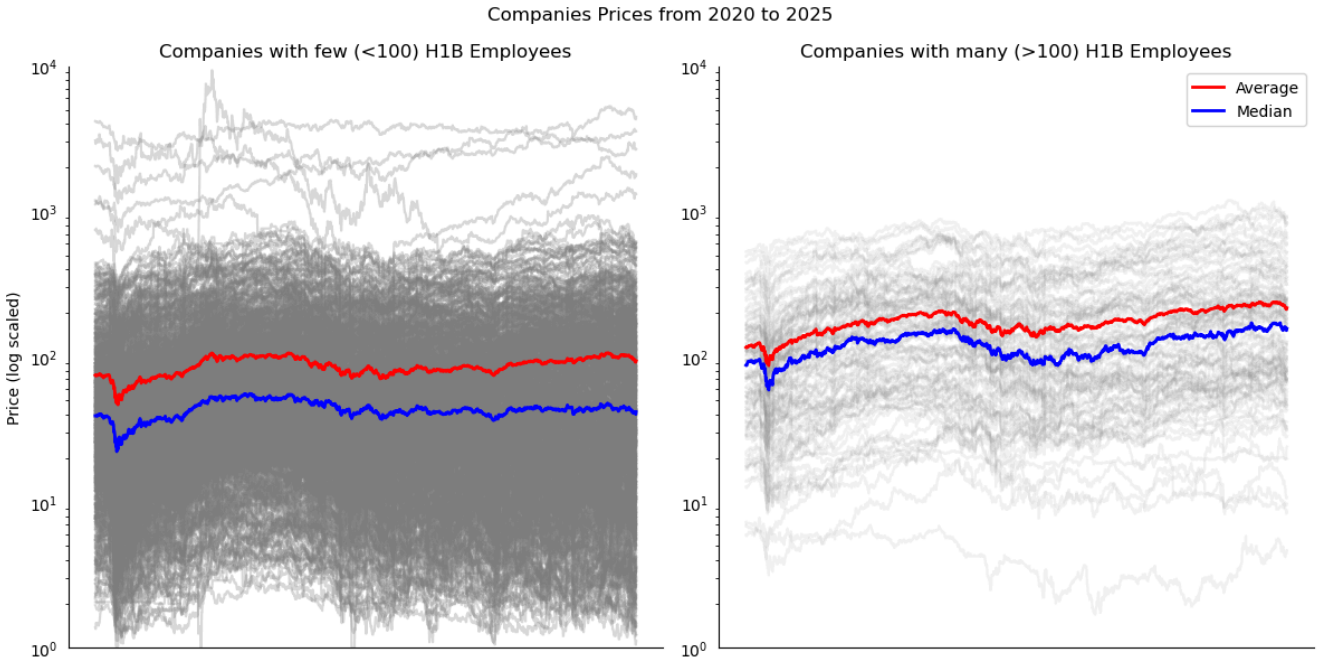


Figure 2.5



Conclusions

Our analysis examined whether companies that employ H-1B workers differ financially from those that do not, and where H-1B employment is concentrated geographically and by industry. While broad financial differences were not statistically significant, companies with fewer than 100 H-1B employees showed trends of higher forward P/E ratios, stronger profit margins, and lower short interest, suggesting potential investor optimism toward firms hiring specialized immigrant talent. We found that H-1B workers are heavily concentrated in tech hubs like Seattle and Mountain View, and that industries such as software, IT services, and internet retail rely most on H-1B sponsorship. Overall, while financial impacts are nuanced, our findings highlight the critical role high-skilled immigrant labor plays in supporting key sectors and regional economies.

Opportunities for Future Research

Future research could expand by analyzing 10-K filings to identify companies citing labor shortages as a reason for pursuing H-1B sponsorship, potentially signaling future growth opportunities. Incorporating more frequent updates, such as weekly data refreshes, would also allow for more dynamic analysis of emerging trends. Additionally, if country-of-origin data for H-1B employees were available, an interactive global migration map could be created to illustrate the flow of talent into specific U.S. regions.

Data References

H-1B Employer Data Hub | USCIS

SEC.gov | SEC and Markets Data

Yahoo Finance - Stock Market Live, Quotes, Business & Finance News