# Analyzing H1B Sponsorship Trends in the US Financial Sector (2016-2024)

EPPS 6323 – Knowledge Mining By Chakrayuddh Kimsovanna 05/06/2025

## Overview

- The purpose of the project is to look at how H1B visa approvals and job demand in the US financial sector have changed from 2016 to 2024, by categorizing finance-related job titles into different groups and tracking their trends over time.
  - > Data relied heavily on Department of Labor (DOL) and USCIS statistics
  - ➤ Used text preprocessing (NLP), K-means clustering, and semantic embeddings using BERT
  - ➤ R and Python (via reticulate); some of the packages used include tidyverse, cluster, readxl, janitor, ggplot2, wordcloud, sentence\_transformers, and sklearn



### H-1B Employer Datahub

Crosstab View

Note: Filters will change based on selections made.

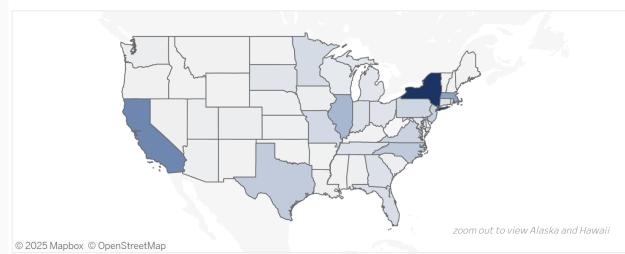
scal Year	Employer (Petitioner) Name	
2024	(AII)	

Industry (NAICS) Code

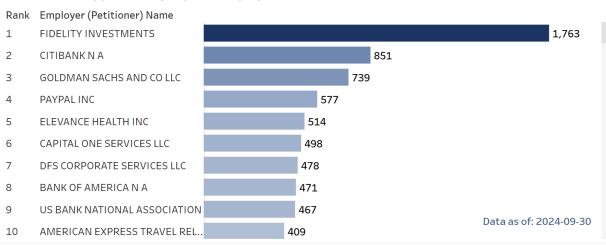
52 - Finance and Insurance ▼

Petitioner City Petitioner State Petitioner Zip (AII) (All) (AII)

**Reset Filters** 



#### Beneficiaries Approved - by Top 100 Employers (see crosstab view for full list)





## H-1B Employer Datahub

Return to Dashboard

Industry (NAICS) Code

Note: Filters will change based on selections made.

(AII)

Fiscal Year Employer (Petitioner) Name 2024 ▼ (AII)

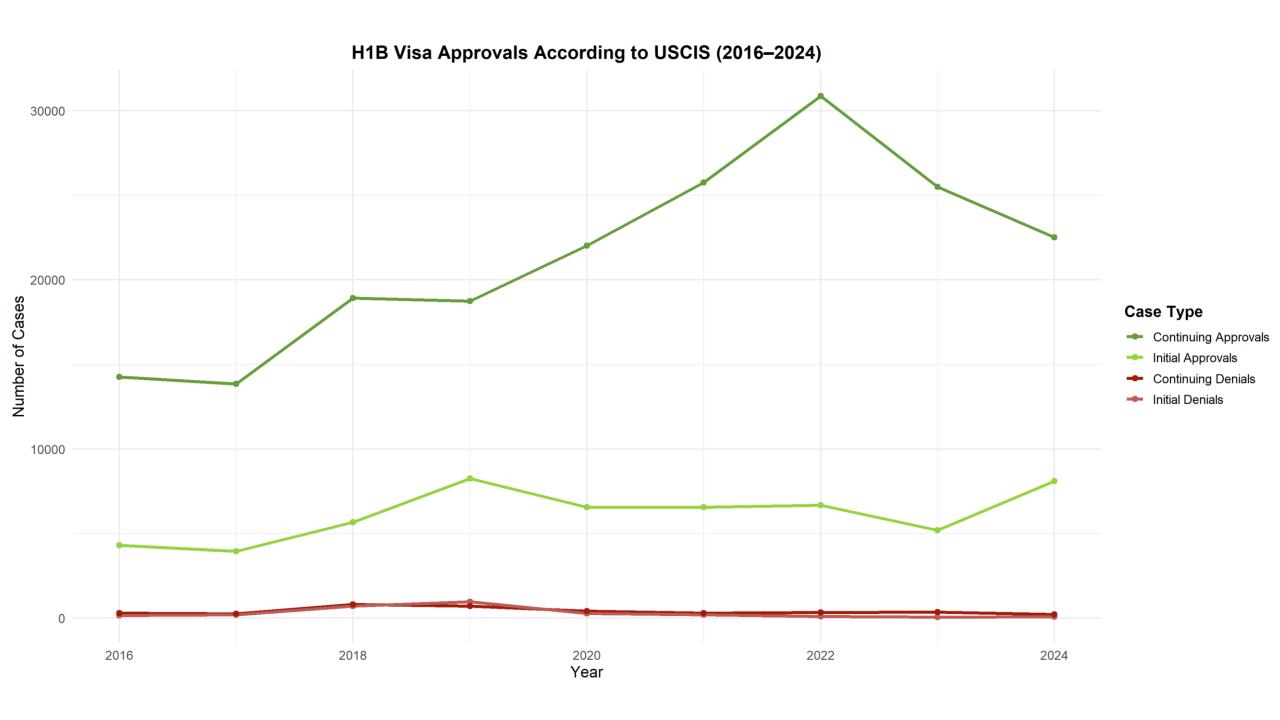
Petitioner City Petitioner State Petitioner Zip (AII) (AII)

Download to Excel

**Reset Filters** 

52 - Finance and Insurance ▼

Fiscal Year 2024	Employer (Petitioner) Name 8 RIVERS SERVICES LLC	<b>Tax ID</b> 2388	Industry (NAICS) Code 52 - Finance and Insurance	Petitioner Cit DURHAM
2024	9 FORTUNES SERVICES INC	1136	52 - Finance and Insurance	IRVINE
2024	10T HOLDINGS LLC	6555	52 - Finance and Insurance	GREENWICH
2024	11 CAPITAL PARTNERS LP	7163	52 - Finance and Insurance	NEW YORK
2024	12 WEST CAPITAL MANAGEMENT LP	6594	52 - Finance and Insurance	NEW YORK
2024	12TEN ADVISORS LLC	3714	52 - Finance and Insurance	MIAMI
2024	16TH AMENDMENT ADVISORS LLC	4728	52 - Finance and Insurance	NEW YORK
2024	21ST MORTGAGE CORPORATION	8830	52 - Finance and Insurance	KNOXVILLE
2024	22V RESEARCH LLC	4070	52 - Finance and Insurance	NEW YORK
2024	32HEALTH INC	8261	52 - Finance and Insurance	CHESTNUT H
2024	57 STARS LLC	3783	52 - Finance and Insurance	ARLINGTON
2024	57 STARS LLC	3783	52 - Finance and Insurance	WASHINGTO
2024	213 MANAGEMENT LLC DBA SANDBO	7655	52 - Finance and Insurance	CHICAGO
2024	360 ONE INC	9442	52 - Finance and Insurance	NEW YORK
2024	776 MANAGEMENT LLC	8310	52 - Finance and Insurance	JUPITER
2024	818 CAPITAL GROUP LLC	8018	52 - Finance and Insurance	LIBERTYVILL
2024	A & A EVER BROTHERS INC DBA MON	3209	52 - Finance and Insurance	LAKE FORES
2024	A FIN MANAGEMENT LLC	4960	52 - Finance and Insurance	SUNNY ISLES
2024	A-MAX INSURANCE SERVICES INC	5276	52 - Finance and Insurance	DALLAS
2024	AAA LIFE INSURANCE COMPANY	1929	52 - Finance and Insurance	LIVONIA
2024	AB CARVAL INVESTORS L P	3520	52 - Finance and Insurance	MINNEAPOL
2024	ABA INSURANCE SERVICES INC	3563	52 - Finance and Insurance	SHAKER HEI
2024	ABACUS INSURANCE & FINANCIAL SE	7372	52 - Finance and Insurance	IRVING
2024	ABARCA HEALTH, LLC	2627	52 - Finance and Insurance	SAN JUAN
2024	ABD INSURANCE AND FINANCIAL SER	3528	52 - Finance and Insurance	SAN FRANCIS
2024	ABD INSURANCE AND FINANCIAL SER	3528	52 - Finance and Insurance	SAN FRANCI:
2024	ABN AMRO CLEARING USA LLC	8071	52 - Finance and Insurance	CHICAGO



## https://www.dol.gov/agencies/eta/foreign-labor/performance



e\_Data\_FY16.xl SX



Data FY2021 Q3.xlsx



Data FY2024



e\_Data\_FY17.xl SX



e Data FY2018 EOY.xlsx



e Data FY2019 .xlsx



**⊘** LCA Disclosure Data FY2020 Q1.xlsx



Data FY2020 Q2.xlsx



**⊘** LCA Disclosure \_Data\_FY2020\_ Q3.xlsx



Data FY2020 Q4.xlsx



Data FY2021 Q1.xlsx



\_Data\_FY2021\_ Q2.xlsx



\_Data\_FY2023\_ Q4.xlsx



Data FY2021 Data FY2022 Q4.xlsx Q1.xlsx



Data FY2022 Q2.xlsx



Data FY2022 Q3.xlsx



Data FY2022 Q4.xlsx



\_Data\_FY2023\_ Q1.xlsx



Data FY2023 Q2.xlsx



Data FY2023 Q3.xlsx



Q1.xlsx



Data FY2024 Q2.xlsx



Data FY2024 Q3.xlsx



**⊘** LCA Disclosure Data FY2024 Q4.xlsx

JOB_TITLE	<b>*</b>
Financial and Investment Analysts - KBGFJG72284-11	ANALYST
Model/Analysis/Validation Senior Analyst Accountants and Auditors - Kbgfjg179876-5 Accountants and Auditors - Kbgfjg140954-6 Director, Sponsor Underwriting, Capital Markets Treasury Analyst	Financial Analysts - KBGFJG132968-8
	Associate, Banking
	Manager, Financial Reporting Valuation Services
	Director, Financial Services Disputes
	Associate Director – GRM Technology
Accountants and Auditors - KBGFJG102001-7	Credit Portfolio Sr. Analyst
Associate III	Senior Staff Accountant
FINANCIAL RISK SPECIALIST	Associate, Banking Analyst
Assistant Vice President	
Technical Data Analyst	Product Analyst
Accountants and Auditors - KBGFJG265299-1	Data Scientist
Tax Senior	Manager
Accountants and Auditors - Kbgfjg227420-4	Financial Analyst
Supervisor, Audit & Attest	Senior Financial Analyst, AVP
Audit Manager	Business Analyst
Accountants and Auditors - Kbgfjg159935-6	Financial Analysts - KBGFJG132968-8
Accountants and Auditors - Kbgfjg182835-4	Audit & Assurance Assistant
Accountants and Auditors - Kbgfjg202575-4	Market Analyst
Accountants and Auditors - KBGFJG101848-6	Vice President / Trader II
Accountants and Auditors - KBGFJG132073-4	·
Lead Trade Operations Analyst	Audit & Assurance Manager
Accountants and Auditors - Kbgfjg131909-4	Associate, Investment Product Specialist
Associate	Staff Accountant
Accountants and Auditors - Kbgfjg87152-10	Tax Senior
	Audit Associate

# **Data Processing**

```
finance_keywords <- c(
   "financ", "investor", "investing", "accounting", "accountant",
   "actuary", "treasury", "risk", "compliance", "quantitative",
   "portfolio", "equity", "asset", "securities", "hedge", "audit",
   "valuation", "credit", "bank", "underwriter", "tax"
)</pre>
```

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#### 2023

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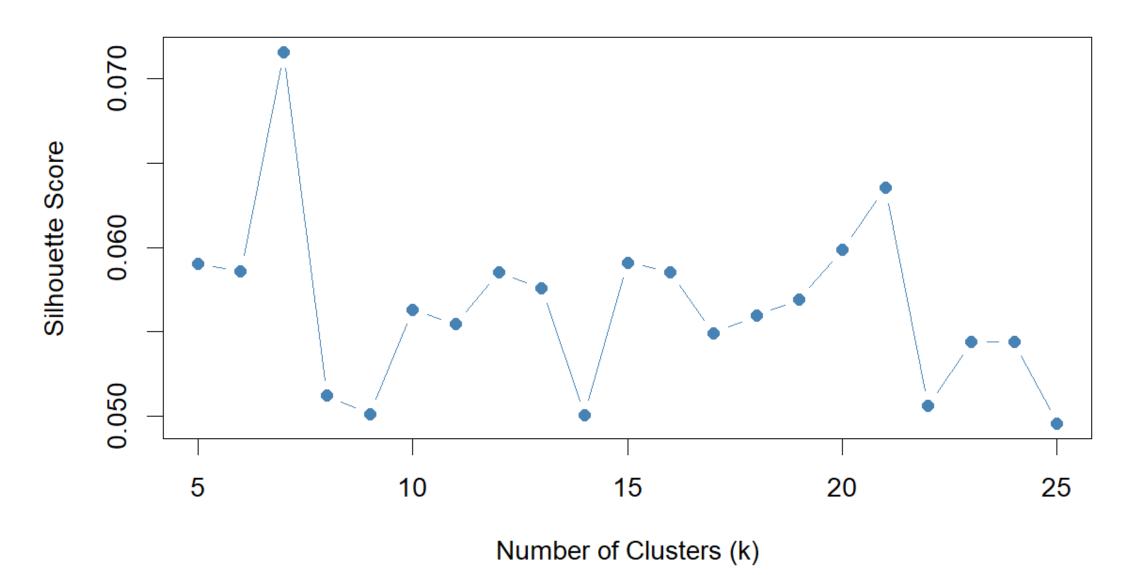
2021

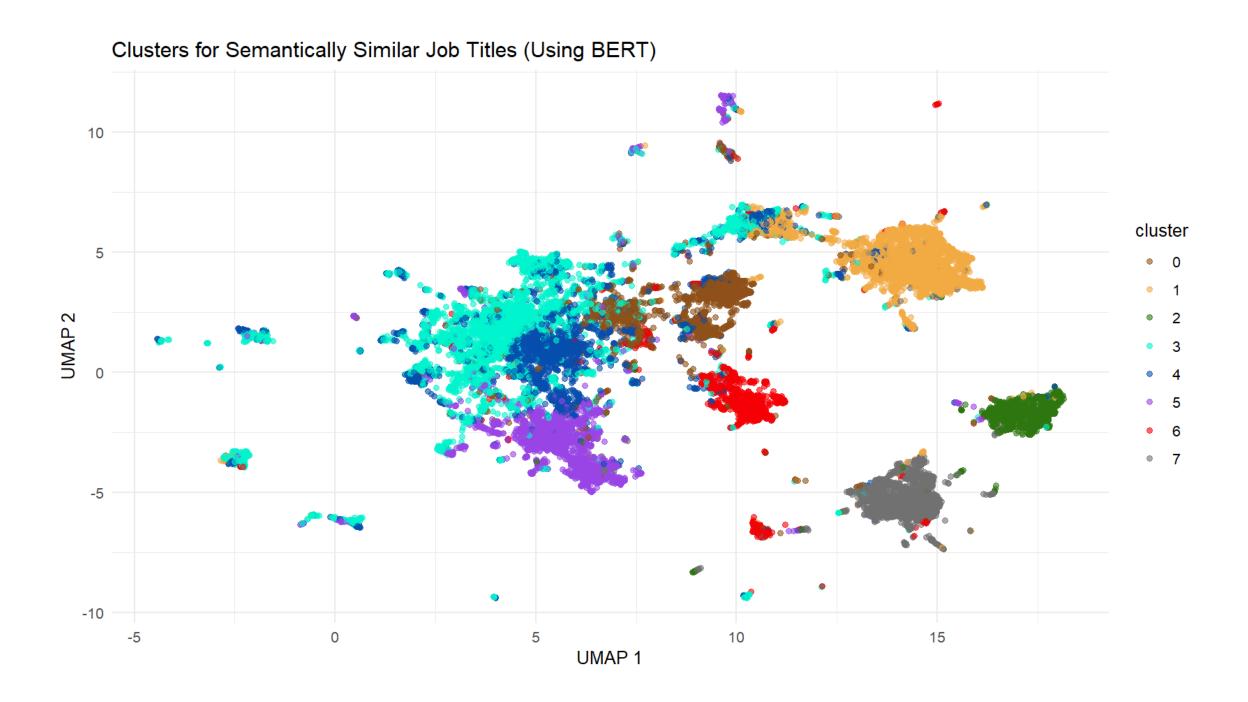
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#### 2024

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## Silhouette Score vs. Number of Clusters





#### Cluster 0 Cluster 1 integrity infrastructure 5 catastrophe

scientist strategies professional construction applications information quant construction approaches minimum quain modeling products partner reportingles wealth products partner reportingles wealth derivative systems managing coordinator role wealth program income underwriter solutions international strategic systems and solutions international derivatives mgmt acquisition from a construction from the construction of th economics corporate analytics securities finance advisory public structuring enterprise cross relations of structuring enterprise cross relations of structured control exceptions of structured cont assets taxvaluation assistant investments allocation development business and particular developer analysiscredit america advisorstrategist hedge brand fundsgovernance market equities institutional marror. servicing performance<sub>e</sub>merging optimization underwriting implementation integration

#### Cluster 3

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#### Cluster 6

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support

#### Cluster 4

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engineering advisory compliance workday
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```

#### Cluster 7

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implementation
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                                                                                                                                                              production medical cybersecurity authorized monitoring quantitative
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                                                                                                                                                                                                                                               sustainability enterprise
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#### Cluster 2

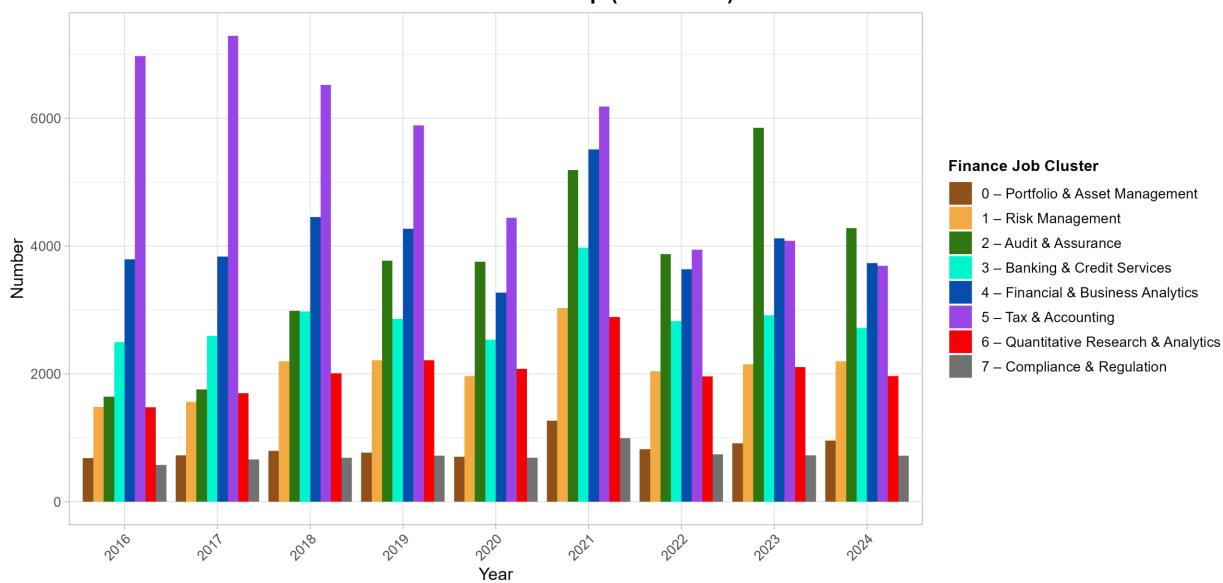


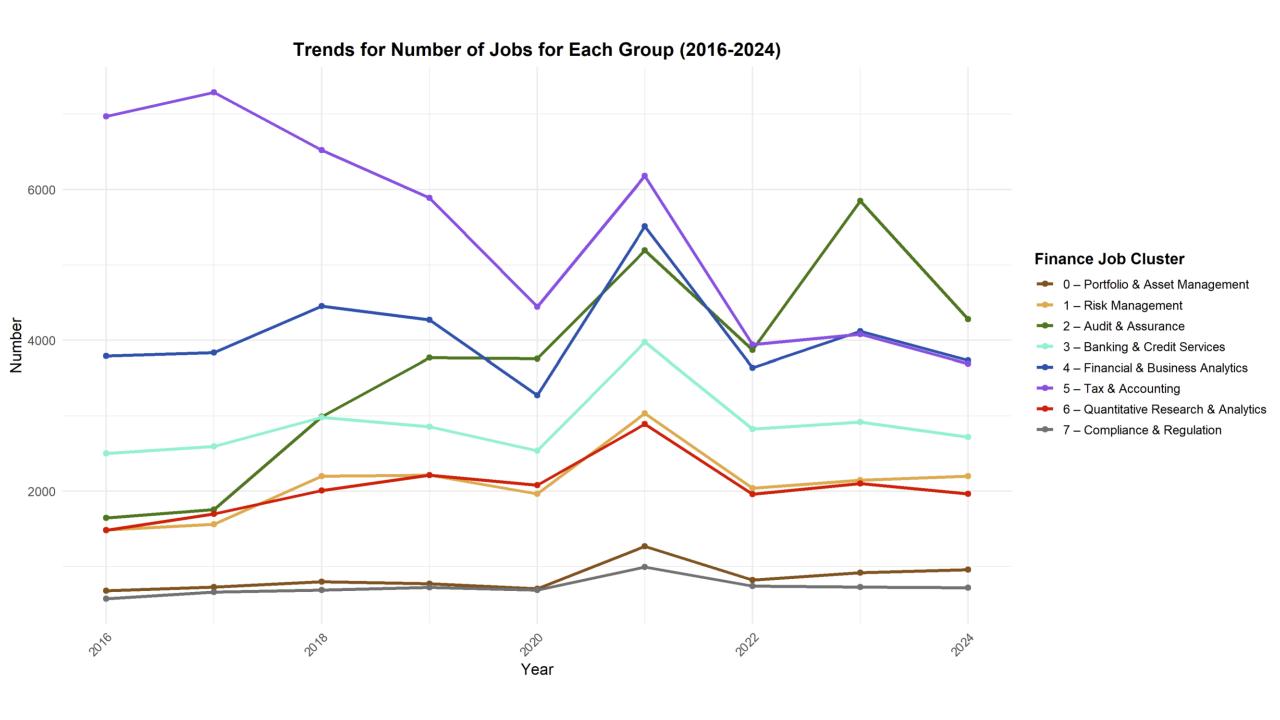
#### Cluster 5

```
recognition manufacturing liability surveys administration accountantinancial surveys administration accountantinancial surveys and particular surveys and parti
analytics control eplanning compliance trade control eplanning compliance controller advisory controller endough client and project estate corporate analyst fund of valuation services financial costs and actuary 44
              external healthglobal actuary staff ax supervisor
                                 actuarial analysis budget chief leaderoffice
                                             inventory
                                                         real accountant
         account accoun
                                                                             automation team executive department solutions
                                                                                                       payable administrator consultingsoftware
                                                                                                                             research equity program income
                                                                                                       bookkeeping managing forensic reinsurance
                                                                                                                        consolidations marketing modeling practice assessment
```

- 0 Portfolio & Asset Management
- 1 Risk Management
- 2 Audit & Assurance
- 3 Banking & Credit Services
- 4 Financial & Business Analytics
- 5 Tax & Accounting
- 6 Quantitative Research & Analytics
- 7 Compliance & Regulation

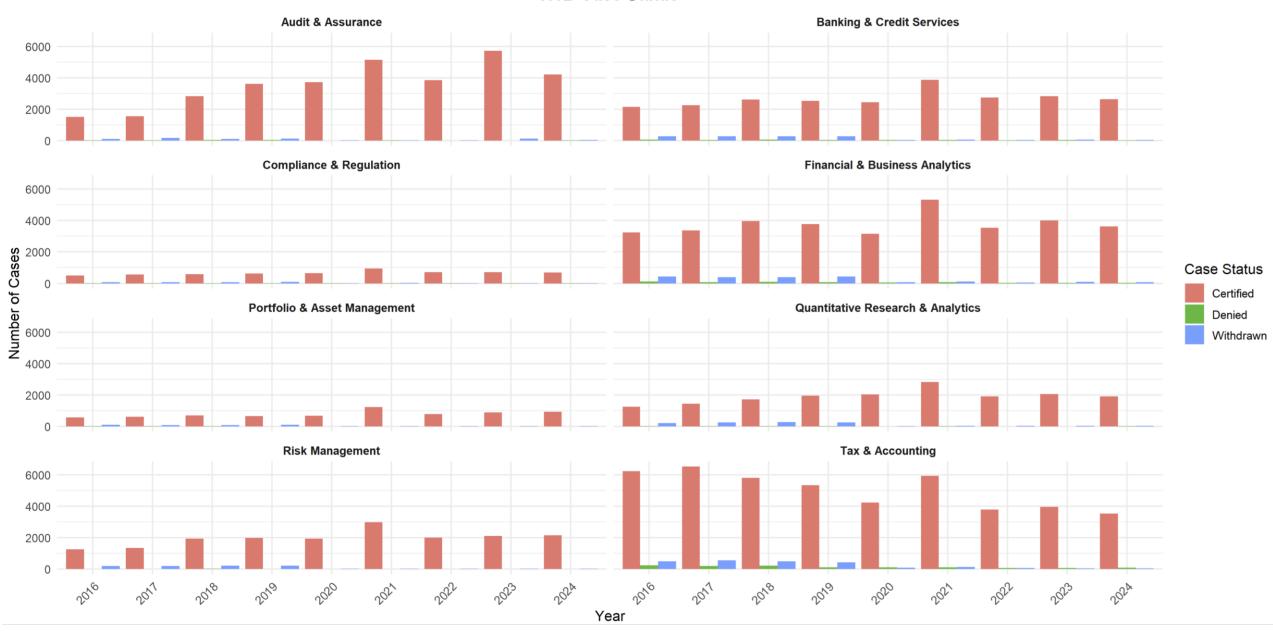
## **Number of Jobs for Each Group (2016-2024)**





```
year total_jobs
<int>
                       <int>
 <u>2</u>016
                      <u>19</u>132
                      <u>20</u>124
 <u>2</u>017
 <u>2</u>018
                      <u>22</u>640
 <u>2</u>019
                      <u>22</u>715
 <u>2</u>020
                      <u>19</u>452
 <u>2</u>021
                      <u>29</u>049
 <u>2</u>022
                      <u>19</u>843
 <u>2</u>023
                      <u>22</u>865
 2024
                       <u>20</u>268
```

#### **H1B Case Status**



## Challenges

- ➤ Very big data leading to frequent crashes
  - > R session terminated
  - > Kernel-Power Event ID 41 Task Category (63)
- >Dropping wages due to complexity of data
  - > Hourly vs biweekly vs monthly vs yearly



Thank you.