Understanding Recruitment Challenges in the U.S. Federal Government

Yi Ming, Pablo Liu, Arin Fisher

# 1. Introduction

The employment landscape within the U.S. federal government is undergoing significant transformation, driven by rapid technological advancements. This revolution not only presents challenges but also offers unprecedented opportunities for strategic workforce development (Frank et al., 2019). The motivation for this study stems from the urgent need to understand and prepare for the transformative impact of emerging technologies on the public sector labor market. As technology continues to evolve, federal agencies must anticipate how these changes will affect their human resource needs, job design, and overall organizational structure.

In the field of public administration, the critical issue we care most about is how emerging technologies will influence the public sector workforce. This research project proposes to address one specific aspect of this broader issue: What are the causes behind recruitment difficulties for technology-related positions in the federal government? Our hypothesis is that technology positions require higher levels of technical competency, making recruitment more challenging. Therefore, this study will focus on STEM occupations within the federal government.

The explanatory variables in this research include whether the position is STEM-related, the required level of competency, whether the job requires a college degree, and whether the recruitment is internal or external. The outcome variable is recruitment difficulty, measured by the vacancy time interval of positions using data from the U.S. Office of Personnel Management (OPM).

# 2. Data

In this project, we will use this dataset CLEAR INSIGHT Database:

<https://www.uscclear.com/insight/datasetcodebook>

This dataset is compiled and collected by researchers from USC Civic Leadership Education and Research (CLEAR) Initiative. The data mainly includes the following part:

* BLS: The Bureau of Labor Statistics’s Occupational Employment and Wage Statistics (OEWS) dataset.
* OPM FedScope Cube: A data cube brings together key dimensions (data elements) on the Federal workforce provided by Office of Personnel Management (OPM)

# 3. Empirical Methods

*Your method of analysis should be OLS regression (or, if your outcome is a dummy variable, a related method discussed later when we cover limited dependent variables). List and briefly describe your dependent variable, explanatory variable of interest, and other potentially important control variables.*

Regression Model: OLS

The dependent variable is the vacancy time interval of an occupation, which represents how hard it is to recruit for this occupation.

The independent variables are a set of features that represents the characteristics of each occupation, including:

* Agency: Department Name
* Pay\_Grade: GS pay grade level
* Vancany\_Job\_Title: The job title of the occupation
* Assesment\_used: Flag indicating if an assessment is used for the announcement. The assessment is used by agencies within the application at the time applicants apply for a position.
* Total\_Applications: Number of applicants who applied to this job
* STEM: stem-related occupation
* ……

There are a lot of potential variables we could used in regression modeling, so we will decide the list of explanatory variables after we conduct the Exploratory Data Analysis (EDA)

# 4. Work Plan

Week 6~8: Formulate Hypothesis & Theory Building

Week 9~10: Data Preparation & EDA

Week 11~Final: Regression Analysis & Conclusion

# Reference

Frank MR, Autor D, Bessen JE, Brynjolfsson E, Cebrian M, Deming DJ, Feldman M, Groh M, Lobo J, Moro E, Wang D, Youn H, Rahwan I. Toward understanding the impact of artificial intelligence on labor. Proc Natl Acad Sci U S A. 2019 Apr 2;116(14):6531-6539. doi: 10.1073/pnas.1900949116. Epub 2019 Mar 25. PMID: 30910965; PMCID: PMC6452673.