Summary of *Silent Suffering: Using Machine Learning to Measure CEO Depression*

SUNG-YUAN CHENG AND NARGESS M. GOLSHAN (JAR, 2025)

Summarized by Li Ziming

1. **What are the research questions?**
   - How the prevalence and severity of depression among CEOs?
   - What factors related to CEO depression?
   - How CEO depression relates to career outcomes, firm performance, and stock reactions?

2. **Why are the research questions interesting?**
   - CEOs play a crucial role in corporate decision-making. Understanding how CEO depression affects corporate governance and risk management is important.
   - Unlike overconfidence or narcissism, CEO depression is not outwardly visible but can have profound effects on corporate decision-making and risk-taking.

3. **What is the paper's contribution?**
   - Contribute to literature on how CEO characteristics explain career outcomes.
     - Prior literature: investment, financing, and disclosure policies. (Ham et al., 2018)
     - Extend: CEO depression has impact on career outcomes.
   - Contribute to literature examining effect of mood changes on economic activity and decisions.
     - Prior literature: weather or hospital admissions (Engelberg and Parsons, 2016) as proxies for low mood.
     - Extend: measure CEO depression from vocal acoustic features using ML model.
   - Contribute literature on impact of vocal cues in financial markets.
     - Prior literature: how voices are perceived by investors, analysts, and auditors.
     - Extend: use ML to analyze vocal acoustic features imperceptible to the human ear.

4. **What hypotheses are tested in the paper?**
   - H1: CEO depression is positively associated with firm risk and negatively with job demands.
   - H2: CEO depression is positively associated with TPS and PPS.
   - H3: CEO depression does not influence firm performance and stock return.

   a) **Do these hypotheses follow from and answer the research questions?**

   - Yes.

   b) **Do these hypotheses follow from theory? Explain logic of the hypotheses.**

   - Cognitive Psychology and Depression: depression exhibit heightened sensitivity to punishment and reduced sensitivity to rewards (Eshel and Roiser, 2010).
   - Behavioral Finance and Corporate Decision-Making: Depression affects risk tolerance. Depressed CEOs might engage in conservative decision-making.

5. **Sample: comment on the appropriateness of the sample selection procedures.**
   - Dataset excludes CEOs of private firms, limiting generalizability beyond large public companies.

6. **Comment on the appropriateness of variable definition and measurement.**

   - CEO depression score is derived from machine learning predictions, which is innovative but relies on indirect acoustic markers rather than direct clinical diagnoses.

7. **Comment on the appropriateness of the regress/predict model specification.**

   - The study does not establish a clear causal link between CEO depression and career outcomes due to endogeneity concerns.

8. **What difficulties arise in drawing inferences from the empirical work?**

   - Vocal acoustic features may not capture all aspects of CEO depression, leading to potential misclassification.

9. **Describe at least one publishable and feasible extension of this research.**

   - Analyze capital expenditure (CAPEX) and mergers and acquisitions activity for CEOs with high depression scores.

10. **What is the association between three literature?**

    - Manage the risk of economic agents' behavior and emotions: behavior and emotions reflect personal characteristics and wealth (Berg et al., 2020; Chang et al., 2024); further influence economic activity and decisions (Cheng and Golsha, 2025)

    - Non-traditional data + Fintech: Behavioral data sources (digital, facial, vocal) can improve assessment efficiency and provide incremental information.