ANALYZING THE IMPACT OF MINIMUM WAGE INCREASES ON EMPLOYMENT USING EVIEWS PANEL DATA REGRESSION

1. Overview

Client:

A U.S.-based labor economics research center advising state governments and think tanks on employment policy

Objective:

To empirically evaluate the effects of minimum wage increases on employment levels using panel data econometrics in EViews. The aim was to support evidence-based recommendations for future state-level wage legislation.

2. Background

The debate around minimum wage increases hinges on their potential trade-off between wage gains and job losses. The client wanted a rigorous empirical study using real-world data from U.S. states to quantify this relationship, accounting for regional and time-specific heterogeneity. EViews was selected for its ability to handle fixed and random effects panel data models with diagnostic tools.

3. Data Summary

Panel Structure:

50 U.S. states × 11 years (2010–2020) = 550 observations (balanced panel)

Variables Used:

Variable	Type	Description
Employment_Rate	Dependent	State-level employment rate (%)
Minimum_Wage	Independent	Statutory minimum wage (USD/hour)
GDP_per_Capita	Control	Real state-level GDP per capita (in USD)
High_School_Ed (%)	Control	% of population with at least high school education

Year Fixed Effects	Included	To account for national macroeconomic trends
State Fixed Effects	Included	To control for unobserved state-specific characteristics

4. Methodology

Software Used:

EViews 13

Model Type:

Panel Least Squares with Fixed Effects (LSDV)

Steps in EViews:

1. **Data Import and Panel Setup:**

   o Excel dataset imported and structured using *Workfile Structure > Panel*

   o Cross-section: State, Time series: Year

2. **Descriptive Analysis:**

   o Summary statistics by state

   o Correlation matrix and heatmap to explore linearity

3. **Fixed vs. Random Effects Decision:**

   o Hausman test conducted → Fixed effects strongly preferred (p < 0.01)

4. **Model Estimation:**

   o *Estimate Equation > Panel Options > Fixed Effects (Cross + Period)*

   o Dependent variable: Employment_Rate

   o Robust White cross-section standard errors used to address heteroskedasticity

5. Key Results

Predictor	Coefficient (β)	p-value	Interpretation
Minimum_Wage	–0.213	0.027	\$1 increase → 0.21 percentage point drop in employment rate

GDP_per_Capita	+0.045	0.012	Higher GDP correlates with higher employment
High_School_Ed	+0.062	0.034	Education level positively associated with employment

Adjusted R² (within): 0.67 **F-Statistic:** Highly significant (p < 0.001) **Hausman Test:** χ^2 = 22.1, p = 0.000 → Fixed effects valid

6. Visual Outputs (EViews)

- Coefficient confidence interval plot

- State-level residual maps (external overlay)

- Line plots: Employment rate vs. Minimum wage (by state)

- Model diagnostics summary table

7. Deliverables

- EViews .wf1 file with full regression, dummy variables, and diagnostics

- Full econometric report (17 pages), including:

  o Research context and econometric theory

  o Fixed effects estimation outputs

  o Robustness checks (excluding outliers, lagged wage model)

  o Policy implications and visual summaries

- Policy memo (3 pages) highlighting:

  o Key findings and coefficient interpretation

  o State-specific recommendations

  o Risks and limits of broad-based minimum wage increases

8. Client Application & Outcome

- Presented to state legislature in a closed policy consultation

- Used to adjust expected employment assumptions in state budget planning

- Referenced in an op-ed advocating regionally indexed minimum wages

9. Strategic Value Delivered

- Offered **data-backed clarity** on a politically sensitive issue

- Enabled **state-level customization of wage policy** based on employment sensitivity

- Showcased EViews as a **reliable tool for public policy econometrics**