Do Minimum Wages Affect Unemployment? Evidence from U.S. State-Level Panel Data

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Abstract

This paper investigates the relationship between minimum wage policy and unemployment in the United States using a comprehensive panel dataset of state-level macroeconomic indicators from 1976 to 2016. Leveraging variation in minimum wages across states and over time, we employ a range of empirical strategies—including ordinary least squares (OLS), fixed effects regressions, difference-in-differences (DiD), and interaction models—to examine whether increases in state minimum wages impact unemployment rates. We further compare these results against national-level trends using a federal macroeconomic dataset for robustness. While naive regressions suggest a negative relationship, the effect diminishes once we control for key economic variables and unobserved heterogeneity. Our fixed effects specification, which accounts for time-invariant state characteristics and national economic shocks, finds no statistically significant causal relationship between higher minimum wages and state unemployment. These findings are consistent with parts of the recent literature and offer policy-relevant insights into the employment consequences of wage regulation.

Keywords: Minimum Wage, Unemployment, Fixed Effects, Panel Data, Difference-in-Differences, Labor Economics, State Policy, Wage Regulation, Macroeconomics, Econometrics

1 Research Question

This project investigates the causal relationship between minimum wage policy and unemployment levels across U.S. states from 1976 to 2016.

Main Research Question: *How do changes in minimum wage affect unemployment rates at the state level?*

This question is central to ongoing debates in labor economics and public policy. While proponents of minimum wage increases argue they improve worker welfare without significant job loss, critics claim they create labor market distortions and raise unemployment. Understanding the true impact is crucial for designing optimal wage policy. This study explores both state- and federal-level wage variation and their respective effects on unemployment rates.

The answer to this question holds direct implications for:

- **Policy makers**, who must balance worker earnings with potential employment tradeoffs.
- **Labor economists**, aiming to understand structural responses to price floors in labor markets.
- **State governments**, especially those diverging from federal minimums or responding to local economic pressures.

2 Dataset Description

The primary dataset used is the *Mega Table*, a panel dataset constructed by merging state-level economic data for all 50 U.S. states and the District of Columbia from 1976 to 2016. It contains over 2,000 observations and includes annual values for variables such as minimum wage (both state and federal), unemployment rates, GDP per capita, inflation rate, labor force participation rate, and poverty rate.

Additionally, a second dataset, the *Federal-Level Table*, aggregates national macroeconomic indicators over the same time period (41 observations). This dataset serves as a robustness check and baseline comparator for nationwide trends. All data originate from reputable public sources including the Bureau of Labor Statistics, the U.S. Census Bureau, and the U.S. Department of Labor.
To capture nuanced effects, we compare fixed effects, difference-in-differences, and interaction models, and contextualize findings using national macroeconomic trends.

Variable Descriptions by Category

To facilitate clarity and interpretation, the following summarizes all 13 key variables used across both datasets (Mega Table and Federal Level Table):

1. Policy Variables

These variables capture legislated wage policies at both the state and federal levels.

- **Minimum_Wage_State**: The state-level minimum hourly wage set by individual U.S. states.
- **Minimum_Wage_Federal**: The federal minimum hourly wage established by U.S. national policy.

2. Labor Market Outcomes

Indicators measuring employment-related outcomes at both state and national levels.

- **Unemployment%_state**: Percentage of the state labor force actively seeking employment.
- **Unemployment_Rate_Federal**: National unemployment rate, averaged across all U.S. states.
- **LFPR (Labor Force Participation Rate)**: The percentage of the working-age population employed or actively looking for work.

3. Economic Performance Indicators

Metrics reflecting macroeconomic growth and productivity.

- **GDP_perCap**: Real Gross Domestic Product per capita, indicating average economic output per person.
- **Real_GDP_%Change**: Year-over-year percentage growth in real GDP, reflecting overall economic expansion or contraction.

4. Price and Inflation Metrics

Variables tracking price level changes and inflation trends over time.

- **Inflation_rate**: Annual percentage increase in prices, capturing macroeconomic inflationary pressure.
- **CPI (Consumer Price Index)**: Index measuring average change in prices of goods and services purchased by households.

5. Monetary and Financial Conditions

Interest rates affecting investment, borrowing, and macroeconomic stability.

- **Federal_Interest_Rate**: Benchmark interest rate set by the Federal Reserve, influencing credit markets and investment.

6. Social and Demographic Indicators

Measures of economic hardship and social conditions among the population.

- **Poverty_Rate**: Proportion of individuals in a state or nationally living below the official poverty threshold.

7. Temporal and Geographic Identifiers

Basic indexing variables for organizing observations by time and location.

- **Year**: The calendar year for the recorded observation.
- **State**: U.S. state name, used for sub-national comparisons and fixed effects.

3 Summary Statistics: Mega Table Dataset (1976–2016)

Descriptive Overview

The Mega Table dataset contains 2,091 observations of state-level economic indicators across all 51 U.S. states from 1976 to 2016. Table 1 and Table 2 report summary statistics for each of the 13 key variables used in the analysis. These include measures of policy (minimum wage), labor outcomes (unemployment, LFPR), macroeconomic indicators (GDP per capita, inflation, interest rates, real GDP growth), and cost-of-living or social metrics (CPI, poverty).

Table 1: Summary Statistics (Part I)

Variable	Mean	Std. Dev.	Min	Median	Max
Year	1996.00	11.83	1976.00	1996.00	2016.00
Minimum Wage (State)	4.85	1.76	2.20	4.65	11.50
Minimum Wage (Federal)	4.65	1.54	2.20	4.25	7.25
Unemployment Rate (State)	6.08	2.11	2.20	5.80	18.30
Unemployment Rate (Federal)	6.43	1.52	4.00	6.30	10.40
GDP per Capita ($)	31,710.86	14,766.86	8,592.25	29,967.71	57,904.20
Inflation Rate (%)	3.69	2.81	0.10	3.00	13.30

Table 2: Summary Statistics (Part II)

Variable	Mean	Std. Dev.	Min	Median	Max
Federal Interest Rate (%)	5.21	4.17	0.07	5.25	19.08
Real GDP % Change	2.28	3.16	-6.50	2.70	9.30
Labor Force Participation Rate (LFPR)	81.73	2.45	74.30	82.70	84.60
Poverty Rate (%)	13.08	1.11	11.11	13.08	14.83
Consumer Price Index (CPI)	155.04	54.12	56.90	156.90	240.01

Summary of Key Patterns

The Mega Table dataset spans 41 years of U.S. state-level data and reveals several distinct patterns across variable categories:

- **Policy Variables**: State-level minimum wages exhibit considerable heterogeneity over time, with a mean of $4.85 and values reaching as high as $11.50 in progressive states. In contrast, the federal minimum wage is more stable and lower on average, reflecting infrequent legislative updates. This divergence provides the key variation used for identification in the analysis.
- **Labor Market Outcomes**: State unemployment rates average 6.08%, but show substantial dispersion—particularly during national recessions and state-specific downturns. LFPR is relatively stable across states and time, with a narrow range clustered around 82%, though slightly lower in earlier decades.
- **Macroeconomic Indicators**: GDP per capita displays high variance across states, highlighting persistent income inequality between richer and poorer regions. Inflation and interest rates are volatile over time, with inflation peaking in the late 1970s and early 1980s and interest rates hitting extreme highs during the Volcker period. Real GDP growth is more variable during recessions but exhibits no long-term upward or downward trend.
- **Social and Cost-of-Living Indicators**: Poverty rates remain tightly centered around 13%, with little state-level volatility. The CPI consistently rises over the decades, tracking the cumulative effects of inflation. Both variables are important contextual controls in any analysis of real wages and labor outcomes.

4 Empirical Methodology

The central goal of this paper is to estimate the causal effect of minimum wage changes—particularly at the state level—on unemployment rates. To do so, we use a combination of pooled

OLS, multivariate regressions with macroeconomic controls, fixed effects panel models, interaction terms, and robustness checks at the federal level. The dataset spans 2,091 state-year observations from 1976 to 2016, allowing for rich longitudinal variation.

Outcome Variable (LHS): The dependent variable in all core regressions is *Unemployment%*, defined as the annual state-level unemployment rate (in percent) for a given state-year observation.

Key Treatment Variable (RHS): The primary regressor of interest is *Minimum_Wage_State*, the state-specific statutory minimum wage in dollars. This variable varies across states and over time and is the central policy lever we evaluate.

The methodological flow proceeds in the following steps:

1. **Descriptive and Diagnostic Analysis:** We begin by examining scatterplots of minimum wage versus unemployment across selected years to explore raw bivariate relationships. Correlation matrices and Variance Inflation Factors (VIFs) are used to assess multicollinearity among controls. No variable transformations (e.g., logs) are applied, as all variables are interpretable in level form and generally bounded with manageable skew.

2. **Baseline OLS Regression:** We first run a simple pooled regression of unemployment on minimum wage without any controls to establish the naive relationship. This step highlights the direction and magnitude of the unconditional association, but is not interpreted causally due to likely omitted variable bias.

3. **Multivariate OLS with Controls:** Next, we augment the model with time-varying macroeconomic controls such as GDP per capita, inflation rate, and poverty rate. These variables help isolate the partial effect of minimum wage changes, accounting for broader economic conditions. The coefficients on minimum wage are interpreted as the change in unemployment rate (in percentage points) associated with a one-dollar change in the minimum wage, holding all else constant.

4. **Fixed Effects Panel Regression:** To address unobserved heterogeneity, we include state and year fixed effects. This is our primary causal specification. State fixed effects (α_i) control for time-invariant state-specific characteristics (e.g., industrial structure, policy attitudes), while year fixed effects (γ_t) capture nationwide shocks (e.g., recessions, federal mandates). This model estimates the within-state effect of wage changes on unemployment over time.

5. **Difference-in-Differences (DiD):** Where applicable, we implement a DiD design using indicator variables for "treated" states (those that implemented minimum wage hikes independent of federal policy) and post-treatment years. This helps

assess whether unemployment changed differentially for treated states post-policy relative to other states.

6. **Interaction Effects:** We also test for interactions between state and federal minimum wage levels to evaluate whether the effect of state policies is amplified or dampened depending on the prevailing federal baseline. This model includes both levels and their product as regressors.

7. **Robustness Check (Federal-Level Data):** Finally, we replicate a comparable regression using a separate federal-level dataset to contextualize national trends in unemployment and federal minimum wage policy. This provides a non-causal benchmark and helps rule out spurious correlations or artifacts of the state-level structure.

Throughout, hypothesis tests focus on whether the coefficient on *Minimum_Wage_State* (or relevant DiD or interaction terms) is statistically different from zero. A positive and significant coefficient would imply that higher minimum wages are associated with higher unemployment, while a negative coefficient suggests the opposite. Coefficients are interpreted in level terms (percentage-point change in unemployment per $1 wage change), and p-values and confidence intervals are used to assess statistical significance.

5 Discussion of Regression Results

This section evaluates the empirical findings from a sequence of regressions designed to investigate the impact of minimum wage policies on unemployment rates at the U.S. state level. We focus primarily on three key specifications: (1) a baseline univariate OLS model, (2) a multivariate OLS with key macroeconomic controls, and (3) a panel fixed effects regression incorporating both state and year fixed effects. Additional models are referenced to demonstrate robustness and to highlight methodological choices.

1. Baseline Univariate Regression

The simplest specification estimates the direct relationship between state minimum wages and unemployment rates using a pooled OLS regression:

$$\text{Unemployment}\%_{it} = \beta_0 + \beta_1 \cdot \text{MinimumWageState}_{it} + \epsilon_{it}$$

Table 3: Univariate Regression Results

Variable	Coef.	Std. Err.	t	p	[0.025	0.975]
const	6.3929	0.135	47.242	0.000	6.128	6.658
Minimum_Wage_State	-0.0648	0.026	-2.470	0.014	-0.116	-0.013

The estimated coefficient on `MinimumWageState` was $\hat{\beta}_1 = -0.0648$ ($p = 0.014$), implying that a \$1 increase in the state minimum wage is associated with a 0.065 percentage point decrease in unemployment. This result suggests a weak but potentially meaningful negative association between higher minimum wages and unemployment, although omitted variable bias is a concern. While statistically significant, the R^2 was just 0.3%, indicating very limited explanatory power.

2. Multivariate Specifications

To investigate the robustness of the relationship between state minimum wages and unemployment rates, several multivariate regressions were estimated, progressively incorporating additional economic controls. Below are the specifications and corresponding results.

Model 1: Minimum Wage and Poverty Rate

$$\text{Unemployment}\%_{it} = \beta_0 + \beta_1 \cdot \text{MinimumWageState}_{it} + \beta_2 \cdot \text{PovertyRate}_{it} + \epsilon_{it}$$

Table 4: Multivariate Regression Results (Minimum Wage and Poverty Rate)

Variable	Coef.	Std. Err.	t	p	[0.025	0.975]
const	-5.4880	0.474	-11.572	0.000	-6.418	-4.558
Minimum_Wage_State	-0.2183	0.024	-9.251	0.000	-0.265	-0.172
Poverty_Rate	0.9655	0.037	25.863	0.000	0.892	1.039

Model 2: Macro Controls with GDP

$$\text{Unemployment}\%_{it} = \beta_0 + \beta_1 \cdot \text{MinimumWageState}_{it} + \beta_2 \cdot \text{GDPperCap}_{it}$$

$$+\beta_3 \cdot \text{InflationRate}_{it} + \beta_4 \cdot \text{FederalInterestRate}_{it} + \epsilon_{it}$$

Table 5: Multivariate Regression Results (Macro Controls with GDP)

Variable	Coef.	Std. Err.	t	p	[0.025	0.975]
const	6.8995	0.251	27.479	0.000	6.407	7.392
Minimum_Wage_State	1.2837	0.077	16.598	0.000	1.132	1.435
GDP_perCap	-0.0002	1.02e-05	-19.327	0.000	-0.000	-0.000
Inflation_rate	-0.0842	0.021	-4.019	0.000	-0.125	-0.043
Federal_Interest_Rate	-0.0880	0.017	-5.284	0.000	-0.121	-0.055

Model 3: Macro Controls with CPI

$$\text{Unemployment\%}_{it} = \beta_0 + \beta_1 \cdot \text{MinimumWageState}_{it} + \beta_2 \cdot \text{CPI}_{it}$$

$$+\beta_3 \cdot \text{InflationRate}_{it} + \beta_4 \cdot \text{FederalInterestRate}_{it} + \epsilon_{it}$$

Table 6: Multivariate Regression Results (Minimum Wage, CPI, Inflation, Interest Rate)

Variable	Coef.	Std. Err.	t	p	[0.025	0.975]
const	8.9180	0.297	29.996	0.000	8.335	9.501
Minimum_Wage_State	1.1433	0.078	14.705	0.000	0.991	1.296
CPI	-0.0490	0.003	-17.239	0.000	-0.055	-0.043
Inflation_rate	-0.1505	0.022	-6.692	0.000	-0.195	-0.106
Federal_Interest_Rate	-0.0440	0.016	-2.687	0.007	-0.076	-0.012

Model 4: Comprehensive Model with LFPR

$$\text{Unemployment\%}_{it} = \beta_0 + \beta_1 \cdot \text{MinimumWageState}_{it} + \beta_2 \cdot \text{GDPperCap}_{it} + \beta_3 \cdot \text{InflationRate}_{it}$$

$$+\beta_4 \cdot \text{PovertyRate}_{it} + \beta_5 \cdot \text{LFPR}_{it} + \epsilon_{it}$$

Table 7: Comprehensive Regression Results (GDP, Inflation, Poverty Rate, LFPR)

Variable	Coef.	Std. Err.	t	p	[0.025	0.975]
const	18.5246	1.678	11.043	0.000	15.235	21.814
Minimum_Wage_State	0.4792	0.073	6.552	0.000	0.336	0.623
GDP_perCap	-7.813e-05	9.23e-06	-8.465	0.000	-9.62e-05	-6e-05
Inflation_rate	-0.1100	0.020	-5.631	0.000	-0.148	-0.072
Poverty_Rate	0.8341	0.037	22.504	0.000	0.761	0.907
LFPR	-0.2789	0.019	-14.486	0.000	-0.317	-0.241

Model 5: Comprehensive Model without LFPR

$$\text{Unemployment\%}_{it} = \beta_0 + \beta_1 \cdot \text{MinimumWageState}_{it} + \beta_2 \cdot \text{GDPperCap}_{it} + \beta_3 \cdot \text{InflationRate}_{it} + \beta_4 \cdot \text{PovertyRate}_{it} + \epsilon_{it}$$

Table 8: Comprehensive Regression Results (GDP, Inflation, Poverty Rate; Excluding LFPR)

Variable	**Coef.**	**Std. Err.**	**t**	**p**	**[0.025**	**0.975]**
const	-4.6369	0.533	-8.706	0.000	-5.681	-3.592
Minimum_Wage_State	0.6813	0.075	9.049	0.000	0.534	0.829
GDP_perCap	-0.0001	9.39e-06	-11.787	0.000	-0.000	-9.23e-05
Inflation_rate	-0.0035	0.019	-0.183	0.855	-0.041	0.034
Poverty_Rate	0.8362	0.039	21.508	0.000	0.760	0.912

Interpretation of Results

The initial inclusion of `PovertyRate` significantly enhanced the negative relationship between minimum wages and unemployment, implying that controlling for poverty, a $1 increase in minimum wage reduces unemployment by approximately 0.218 percentage points. However, the inclusion of broader macroeconomic indicators (GDP per capita, inflation rate, federal interest rate) reversed this relationship dramatically, suggesting substantial omitted variable bias in simpler models. Specifically, the coefficient of `MinimumWageState` turned positive (1.284), highlighting that after controlling for macroeconomic stability, higher minimum wages may correlate with increased unemployment.

Using CPI instead of GDP per capita yielded similar positive results (1.143), reinforcing the robustness of this positive relationship across alternate macroeconomic measures. When the labor force participation rate (LFPR) was included, the minimum wage coefficient moderated to 0.479, still positive, reflecting an essential interaction between minimum wage effects and labor market participation.

Excluding LFPR slightly increased the coefficient (0.681) but maintained the positive relationship. Notably, inflation became insignificant without LFPR, suggesting interplay between labor force dynamics and inflation's explanatory power.

Across these models, the shifting significance and signs of coefficients underscore the critical importance of careful variable selection in econometric analysis. Although R-squared values vary modestly (12.8% to 36.3%), indicating limited overall explanatory power, the selected variables effectively capture essential economic and labor market dynamics affecting unemployment.

3. Fixed Effects Panel Model with Controls (Main Result)

The primary econometric specification employs a fixed effects panel model incorporating key controls, isolating the within-state impact of minimum wage variations:

$$\text{Unemployment}\%_{it} = \beta_1 \cdot \text{Minimum\_Wage\_State}_{it} + \beta_2 \cdot \text{GDP\_perCap}_{it} + \beta_3 \cdot \text{Poverty\_Rate}_{it}$$

$$+\beta_4 \cdot \text{Inflation\_rate}_{it} + \alpha_i + \gamma_t + \epsilon_{it}$$

Table 9: Fixed Effects Panel Model Results

Variable	**Coef.**	**Std. Err.**	**t**	**p**	**[0.025**	**0.975]**
Minimum_Wage_State	0.0216	0.071	0.304	0.761	-0.118	0.161
GDP_perCap	-8.618e-05	9.63e-06	-8.953	0.000	-0.0001	-6.73e-05
Poverty_Rate	0.7431	0.015	51.048	0.000	0.715	0.772
Inflation_rate	-0.1069	0.013	-7.958	0.000	-0.133	-0.081

This fixed effects specification isolates the within-state impacts of minimum wage adjustments on unemployment rates by explicitly controlling for key macroeconomic indicators such as GDP per capita, poverty rate, and inflation, while simultaneously absorbing unobserved, time-invariant state characteristics (α_i) and broader national economic trends (γ_t). The estimated minimum wage coefficient ($\hat{\beta}_1 = 0.0216$, $p = 0.761$) is small, statistically insignificant, and its confidence interval includes zero and remains close to zero (95% CI: -0.118, 0.161). This result clearly indicates that changes in state minimum wages have virtually no discernible causal impact on unemployment rates. The negligible magnitude and statistical insignificance suggest that any observed relationships in simpler models likely result from omitted variable bias rather than true causal effects. The use of fixed effects effectively controls for persistent state-specific factors such as industrial structure, policy preferences, and demographic characteristics, as well as broader national economic shocks, thereby substantially reducing the potential for omitted variable bias and clarifying that minimum wage variations alone do not significantly affect state-level unemployment outcomes.

GDP per capita exhibits a robust negative and statistically significant relationship with unemployment (-8.618×10^{-5}, $p < 0.001$), consistent with economic theory predicting lower unemployment during periods of economic prosperity. Similarly, the poverty rate maintains a strong positive association (0.7431, $p < 0.001$), affirming that higher poverty levels correlate significantly with increased unemployment. Inflation continues to display a significant negative relationship with unemployment (-0.1069, $p < 0.001$),

suggesting that moderate inflationary pressures may coincide with economic environments supportive of lower unemployment.

The high explanatory power of this model ($R^2 = 73.5\%$) underscores its effectiveness in accounting for state-specific and temporal dynamics that substantially influence unemployment rates.

Other Models and Robustness

Flexible Specification (Scatterplots): Visual inspections of scatterplots across sample years show no strong linear trend, confirming the weak correlation between wages and unemployment in cross-sections.

Difference-in-Differences (DiD) Analysis: Applying a DiD framework to compare unemployment changes in treated states (California, Oregon, Washington, Massachusetts, New York, and Connecticut) before and after the 2005 minimum wage increases relative to control states resulted in an insignificant coefficient ($\beta_{\text{DiD}} \approx 0$, $p = 0.224$). This implies that state-led minimum wage hikes did not produce statistically discernible changes in unemployment relative to unaffected states. The positive but statistically insignificant coefficient suggests a negligible causal impact, with broader economic or regional factors likely dominating employment trends during this period.

Interaction Effects: Introducing an interaction between state and federal minimum wages yielded insignificant results ($\beta_3 \approx 0$, p = 0.945), suggesting no clear moderating role of federal policy.

Federal-Level Baseline: A national-level regression using the federal dataset confirmed a significant positive association between `MinimumWageFederal` and `UnemploymentRateFederal` (coef = 0.965, p = 0.031), though the causal direction remains ambiguous.

Summary

Overall, the results evolve substantially across models. Initial evidence points to a small negative effect of minimum wages on unemployment, but this vanishes or reverses once controls and fixed effects are applied. Our most credible estimate — from the panel fixed effects model — suggests that minimum wage increases have no statistically significant effect on unemployment, echoing findings from leading labor economics literature.

6 Literature Review

The relationship between minimum wage policies and unemployment has long been a contentious topic in labor economics. This section reviews foundational and recent aca-

demic work relevant to our analysis, and discusses how the findings of this paper compare or contribute to the existing body of research.

Seminal Studies and Foundational Debates

The landmark study by **Card and Krueger (1994)** challenged the classical economic theory that minimum wage hikes necessarily reduce employment. Using a natural experiment based on the 1992 minimum wage increase in New Jersey, they compared fast-food restaurants across state borders and found no evidence of job losses — and in some cases, even slight employment gains. This pivotal result sparked decades of subsequent research questioning the "disemployment" effect.

Our findings partially align with their conclusions. In particular, our panel fixed effects model finds no statistically significant relationship between changes in state minimum wage and unemployment once we control for state and year fixed effects. This supports the idea that state-level heterogeneity and macroeconomic shocks can confound naïve associations between minimum wage and employment.

Critiques and Replications

In contrast, **Neumark and Wascher (2007)** reanalyzed the Card and Krueger data using administrative payroll records and found evidence of job loss, especially among low-skilled workers. Their broader meta-analyses suggested that most credible studies show either negative or neutral employment effects of minimum wage increases.

This divergence highlights the sensitivity of minimum wage effects to model choice, datasets, and methodological assumptions. Our paper contributes to this debate by showing that in pooled OLS models, the wage coefficient flips sign depending on which macroeconomic controls are included — underscoring the role of multicollinearity and omitted variable bias. Only the fixed effects model offers a stable and interpretable estimate.

Recent Advances and Heterogeneity

Cengiz et al. (2019) offered a more nuanced view by analyzing 138 U.S. minimum wage changes over four decades. They found that employment effects are generally neutral but highly heterogeneous across income percentiles and sectors. Most of the wage increase benefits accrue to workers at or just above the minimum wage threshold, with little impact on overall employment.

This aligns with the flexible scatterplot-based diagnostic step in our paper, which shows no consistent slope between state minimum wages and unemployment in any single year. Furthermore, our regressions using both federal and state-level data suggest

that broader macroeconomic indicators like poverty rate and GDP per capita are much stronger predictors of unemployment than minimum wage alone.

Synthesis and Contribution

Overall, our empirical analysis supports the growing consensus in the literature: minimum wage effects on unemployment are small, variable, and often statistically insignificant once proper controls are added. By using a rich, high-dimensional dataset and comparing results across pooled, controlled, and fixed-effect models, this paper contributes both replication and robustness evidence to the literature. It also demonstrates the importance of model specification, variable selection, and interaction testing in drawing reliable causal conclusions.

7 Conclusion

This project set out to investigate a central policy question: *Does raising the minimum wage lead to higher unemployment?* Through a careful empirical strategy using rich panel data from 1976–2016 across all 50 U.S. states, the analysis revealed a nuanced answer. While simple OLS regressions suggested a weak or even negative relationship between minimum wages and unemployment, the more robust fixed effects panel model indicated that, once state-specific and national time factors were controlled for, the effect of minimum wage increases on unemployment rates was insignificant.

This finding aligns with much of the contemporary empirical literature — including the landmark work of Card and Krueger (1994) — that challenges the classic textbook view of a mechanical trade-off between wage floors and employment levels. Our most rigorous specification, which accounted for both time-invariant heterogeneity and macroeconomic shocks, found no consistent evidence that increasing the state-level minimum wage leads to either job losses or gains in the long run.

However, the analysis is not without limitations. Several important control variables were not available in the dataset, such as education levels, unionization rates, industry composition, and regional economic shocks. These omitted variables could play a substantial role in shaping the labor market response to wage policy. For instance, the employment elasticity of minimum wage hikes may vary substantially across sectors, particularly in service-heavy industries like retail or hospitality. Similarly, state-level labor force dynamics may differ depending on union presence or education attainment, which could moderate the wage-employment relationship.

An interesting future direction would be to explore potential feedback loops: could state-level increases in minimum wage affect macroeconomic variables like inflation, GDP

growth, or the labor force participation rate, which in turn impact unemployment? While these interactions are beyond the scope of this paper, they represent a plausible avenue for general equilibrium effects, and incorporating them could enrich the understanding of wage policy impacts.

Another promising extension would involve collecting micro-level data (e.g., firm or worker panel data) or exploiting exogenous policy shocks using natural experiments or synthetic control methods. Additionally, incorporating heterogeneity by demographic group, sector, or region could uncover masked effects in aggregate regressions.

Overall, this project highlights the value of panel data econometrics and the importance of modeling choices in shaping policy-relevant conclusions. Although the question may seem deceptively simple, its answer is contingent on data quality, model structure, and the economic context — and this study offers one step forward in that ongoing empirical debate.

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