Outline

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1. Introduction

1.1. Background of ACA

- The Affordable Care Act (ACA) was enacted in 2010 in response to failures in the US insurance and healthcare markets, aiming to introduce universal health care reform.
- The ACA included various provisions such as insurance reform, health insurance exchange establishment, and subsidies to achieve nearly universal health insurance coverage.[@courtemancheEarlyImpactsAffordable2017]
- Medicaid Expansion, a crucial ACA provision, was implemented in 2014, allowing childless individuals with income below 138% of the federal poverty level (FPL) to apply for Medicaid coverage.Following the Supreme Court decision in 2012, states had the option to participate in Medicaid Expansion; as of July 2022, 39 states (including DC) have implemented it [@kaiserfamilyfoundationStatusStateMedicaid2022]
- Primary Goals of Medicaid Expansion is goes beyond just enhancing access to medical services;and increase in coverage, it also aims to address health inequities and reducing the disparities that exist among various demographic groups.

1.2. Problem Statement

- Ongoing policy evaluation is necessary even years after implementation to ensure that the policy continues to produce the intended outcomes, adapt to changing circumstances, and address any unforeseen consequences that may have arisen over time.
- Numerous policy analysts and researchers have evaluated the effect of Medicaid on variety of desired outcomes, including direct outcome like insurance coverage and less direct consequences such as unemployment.
- Many investigated whether the Medicaid expansion's benefits were distributed equally across all beneficiary groups.

- One beneficiary groups that hasn't been studied as much as other are vulnerable population but is important to include in the literature are foreign-borns.
  - Many of Foreign-born population benefit from Medicaid expansion. This include low income, US citizen born abroad , US citizen who become citizens through naturalization, and those immigrants that are eligible to receive benefits from public program according to Personal Responsibility and Work Opportunity Reconciliation Act(PRWORA) of 1996..
  - Foreign-born make up a great portion of US population.
  - Foreign-born immigrants are more likely to be low-income.
  - Foreign-born, face additional challenges in access to care
- Understanding how Medicaid expansion impacts these two distinct groups is essential for crafting effective policies that address the intricate interplay between policy, demographics, and healthcare access.

1.3. Research Gap

While few studies compared the effects of the ACA among foreign-born and immigrants vs citizen a critical gap persists in the literature.

1. Those that I find are descriptive one can not infer a causal relationship
2. many are at state level and cannot be generalize to the whole US population
3. Includes one or at most two years of data after the Medicaid expansion went into effect, which is not enough time to see all the outcome of a policy change.
4. They have not isolate the separate effects of expanding Medicaid eligibility versus other changes such as the introduction of market plan insurance subsidies

1.4. Research Questions and Hypotheses

- The central research question guiding this study is: "How does the effect of Medicaid expansion differ between foreign-born and native populations in terms of uninsured rates and Medicaid take-up?" This overarching inquiry will be addressed through the following interconnected objectives:
  - Examine the impact of Medicaid expansion on uninsured rates among foreign-born and native populations, identifying potential disparities. Assess the disparities in Medicaid enrollment and utilization between foreign-born and native individuals following Medicaid expansion. Identify and analyze the multifaceted factors contributing to variations in healthcare access, Medicaid utilization, and barriers to enrollment within these demographic segments.

- Hypothesis 1: The effect of Medicaid expansion on reducing uninsured rates will differ significantly between foreign-born and native populations due to an intricate interplay of demographic, socio-economic, and cultural factors.
- Hypothesis 2: Foreign-born individuals will exhibit a lower propensity for Medicaid take-up post-expansion compared to native individuals, attributed to an amalgamation of linguistic, cultural, and immigration-related complexities.

2. Theoretical Model

2.1. Understanding Rational for Enrolling in Medicaid

- **Conventional health insurance theory**: Individual are risk averse, thus purchase insurance to reduce risk of large loss. Free or subsidized insurance like medicaid increase the insurance demand, increase the risky behavior, increase health care use and reduces welfare.
- **Nyman Theory of Insurance Demand**: Not all individual are risk averse, individual purchase insurance to gain additional income for their time of illness. Offer of free insurance, increase demand for insurance, increase the use of healthcare, increase the social welfare.
- Both Nyman Theory and Conventional health insurance theory are based on rational choice theory.They predict that free or subsidized insurance will increase the demand for the insurance and health care. From Nyman's theory we infer that expanding Medicaid, can improve healthcare utilization and outcomes, but practical challenges complicate this theoretical alignment.
- Empirical evidence shows imperfect uptake of social benefits, diverging from expected theoretical outcomes. Some Medicaid-eligible individuals do not claim entitled benefits (Wehby & Lyu, 2018). Non-utilization of benefits extends globally beyond Medicaid and the US population. Some effectively use social assistance while others do not.
- Non-utilization's significance reaches beyond healthcare access, promoting equitable outcomes.

2.2. Exploring Models That Explains Take-Up Pattern of Social Welfare

- Additional theories and perspectives are crucial to understanding non-utilization complexities.
- The literature on social welfare program participation, like Medicaid, encompasses two key perspectives: traditional economics, which relies on rational choice theory, and behavioral economics, which emphasizes cognitive barriers to decision-making.

- Van Oorschot's Multilevel System Model: provides a valuable overarching framework that ties together various models and factors that offers a comprehensive lens by examining factors across multiple levels.
  - Considers personal motivations, administrative procedures, and policy contexts as intertwined influences on benefit uptake.
  - Allows for analyzing the interplay between individual, administrative, and policy-level factors in Medicaid insurance utilization.

2.3. Foreign-Born vs. Native Populations: A Comparative Approach:

- Contradictory empirical evidence exists on social benefit uptake rates among immigrants and native-born individuals.
- There is uncertainty about whether foreign-born uptake rates are higher, lower, or equivalent.
- Leveraging Van Oorschot's model, I comprehensively examine factors influencing benefit uptake.

2.4. Analyzing Factors Affecting Uptake Among Foreign-born Individuals Using Van Oorschot's Model.

2.4.1. Individual Level Factors:

- *Perceived Deservingness*, foreign-born individuals' perception of entitlement to social benefits based on contributions and circumstances.
- *Institutional Trust*, Trust in host country institutions' fairness and reliability regarding benefit provision.
- *Language Proficiency*, Influence of language skills on benefit comprehension and access.
- *Social Networks*, Impact of personal networks on benefit enrollment decisions.
- *Cultural Perceptions and Stigma*, Role of cultural beliefs and stigma in public assistance choices.
- *Integration Level*, how integration into the host society affects benefit knowledge and utilization.
- *Unfamiliarity with Local Resources* Challenges due to unfamiliarity with local services for accessing benefits.

2.4.2. Administrative Level:

- *Complexities of Procedures and Requirements*: Administrative hurdles faced by foreign-born individuals due to procedural complexities and additional documentation.
- *Administrator Prejudice*: Bias from administrators based on classicism towards immigrants affecting benefit access.

2.4.3. Policy Level:

- *Chilling Effect of Policies*: The discouraging impact of policies like immigration enforcement and public charge rule on seeking benefits.
- *Outreach Programs*: Effectiveness of outreach initiatives targeting foreign-born individuals for benefit awareness.
- *Political Climate and Discourse*: Influence of political context and public discourse on policies related to foreign-born populations.

Drawing from our theoretical insights, we detail data sources, analysis methods, and controls, bridging theoretical concepts with rigorous empirical investigation.

3. Emprical Strategy

3.1. Data

3.1.1. Sources

- American Community Survey (ACS) which is accessible via the Public Use Microdata Sample(PUMS)
- Kaiser Family Foundation(KFF) State's Health Facts for the dynamic status of medicaid expansion.

3.1.2. Sample Restrictions

- To ensure the internal validity of our study and focus on individuals more likely to be eligible for Medicaid, I have carefully established the following sample restrictions:
- Age Inclusion (26-65):Include individuals aged 26 to 65 to exclude ACA's young adult provision and Medicare-eligible individuals.
- Income Threshold (less than138% FPL):Select individuals with incomes at below 138% FPL, aligning with Medicaid eligibility criteria.
- Exclude non-citizens less than 5 years adhering to Lawfully Present Immigrants' waiting period. Recognize data limitations regarding immigration status/visa types.
- Excluded non-citizens who have been residing in U.S. for less than five years. since Lawfully Present Immigrants should wait five year to qualify for Medicaid. Some limitation Immigration status/ visa type is not declreaed in dataset. Refugees and Asylees are not subject to the 5 year bar. Undocumented are on eligible for Medicaid. Some states waived the requirments.
- Time Frame (2011-2019): To avoid ACA's minor provisions in 2010 and COVID-19 complexities in 2020

- Remove states with similar policies for a focused analysis of Medicaid expansion effects.
- Exclude individuals in prisons, nursing homes, mental hospitals, etc. since ACS lacks information on poverty Measures:

3.2. Measures

- **Treatment**: *Medicaid Expansion Status*, binary variable indicating states' decision to expand Medicaid (0 for non-expansion, 1 for expansion during 2014-2020).
- **Outcome**: *Uninsured Rates*, binary variables derived from ACS responses on being insurancd during previous year. *Medicaid Coverage* another binary variables derived from ACS responses on having Medicaid coverage during the previous year.
- **Nativity Status**: binary variable distinguishing individuals as "Native" (1) if born in the U.S. or its territories, and "Foreign-Born" (0) if born outside the U.S.
- **Demographic Characteristics**: *Age*, *gender*, *marital status*, *race*, and *ethnicity*.
- **Socioeconomic Factors**: *Income*, *education*, *employment status*.
- **Disability Status**:Binary variable indicating disability status.
- **Foreign-Born Specific Variables**: *Language Proficiency*, *Length of Residency*, *Region of Origin*. *Citizenship Status*, a binary variable showing if a person is citizen or non-Citizen.
- **State-Level Measures:** *Immigration Policy Climate (IPC) Index*, reflecting immigration policy friendliness or restrictiveness. *Unemployment Rate*, indicating economic conditions. *Americans for Democratic Action (ADA) Scores*, measuring state legislators' perceived liberalism.

3.3. Methodology

3.3.1. Difference-in-Differences (DID) Estimation:

- DID is used to estimate the impact of Medicaid expansion on Uninsured and Medicaid Coverage.
- Utilizing a two-way fixed effects model with differential timing, which enables the incorporation of the Medicaid expansion timeline into the DID analysis.

Model Specification:

$$Y_{ist} = \alpha + \delta_s + \lambda_t + \gamma_s \cdot Treat_{st} + \beta_1(FB_{ist} \times Treat_{st}) + FB_{ist} + \beta X_{ist} + \theta(FB_{ist} \times C_{ist}) + \epsilon_{ist} \quad (1)$$

Equation Components:

- Y_{ist} represents the outcome of individual i in year t in state s.
- δ_s represents state fixed effects.
- λ_t represents year fixed effects.
- γ represents the average treatment effect of Medicaid expansion for state s.
- $Treat_{st}$ is a dummy variable that equals 1 if individual i in state s is exposed to the treatment in year t, and 0 otherwise. For states that expanded Medicaid in 2014, $Treat_{st}$ is equal to 1 for all years after 2014. For states that expanded Medicaid later, T_{ist} is equal to 1 for all years after the year of expansion.
- β_1 represents the coefficient for the interaction term between FB_{ist} and T_{st}, capturing the differential treatment effect for foreign-born individuals. X represents vector of control variables, including racial composition, age distribution, gender distribution, employment, and personal income
- $\theta_k \cdot (FB_{ist} \times C_{ist,k})$ represents the interaction terms between the binary variable FB_{ist} and the control variables specifice to foreign-born individuals ($C_{ist,k}$). These interaction terms capture the differential effects of the control variables for foreign-born individuals compared to native-born individuals.

The standard errors are adjusted to accommodate for serial correlation at the state level and heteroskedastic errors.

3.3.2. Event Study Estimation:

- Additionally, I estimate this effect using an event study model that allows us to assess the evolution of relative outcomes while controlling for fixed differences across states and national trends over time.
- Event study model allows us to test the parallel trends assumption and it provides valuable insights into the temporal dynamics of the treatment effect, enhancing our understanding of the causal relationship between the treatment and the outcome variable.

Model Specification:

$$Y_{its} = \alpha + \delta_s + \lambda_t + \psi X_{ist} + \sum_{k=-4, k\neq -1}^{6} \beta_k D_{k,its} + \epsilon_{its}. \tag{2}$$

Equation Components:

- Y_{ist}: Outcome for individual i each year and state.
- δ_s: State fixed effect.
- λ_t: Year fixed effects.

- X_{idt}: Vector of control variables.

Dynamic Policy Effects:

- $\sum_{n=-3}^{5} \beta_y D_s D_{it}^n$: Captures dynamic effects of policy.
- $D_{k,its}$: Lead and lag dummy variables when state adopts expansion.
- β_y: Estimates change in outcomes in expansion vs. non-expansion states during year y.

Omitted Category:

- $k = -1$: Year prior to expansion, excluded as omitted category.

3.3.3 Addressing challenges of varying treatment effects over time in the literature:

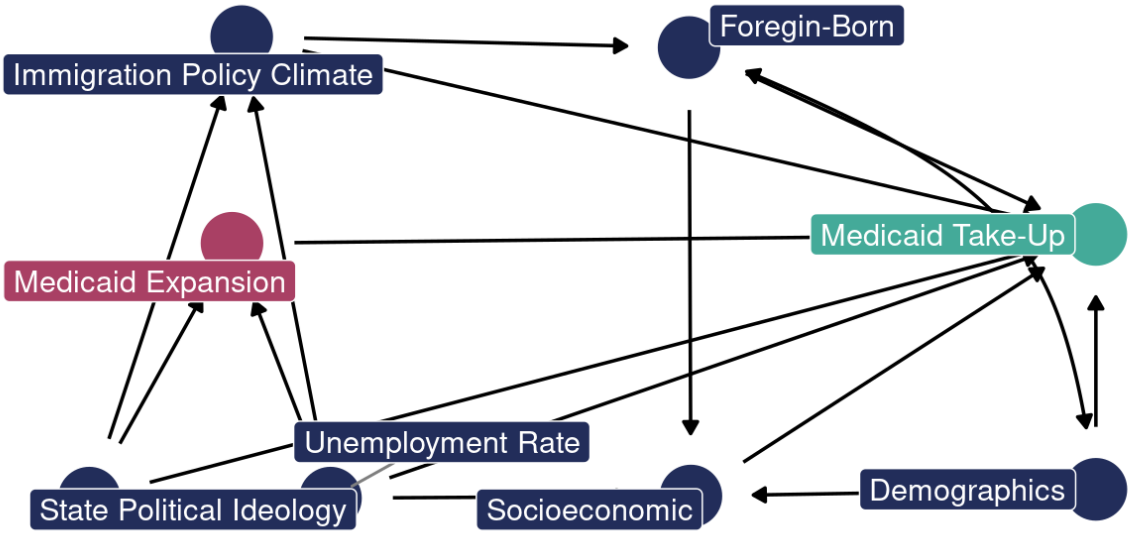
- Recent research in econometrics has raised concerns about the potential bias in staggered difference-in-differences and event studies estimates when treatment effects are heterogeneous and treatment timing varies across units.
- This research is susceptible to these concerns since some states implemented Medicaid expansions after 2014, making the timing of treatment heterogeneous across units.
- To address these challenge I used :
  - Interaction-weighted (IW) event study estimator proposed by Sun & Abraham (2021)
  - Bacon decomposition and examine the consistency of the results.

4. Result

4.1. Causal Structure Discovery

- Employed causal structure discovery techniques to construct a complex DAG from the data itself. to capture variable interactions, account for confounding factors and biases, provide credible evidence for Medicaid expansion effects.
- The DAG generated using multiple constraint-based and score-based algorithms including GDS algorithms, Greedy Equivalence Search (GES), Peter-Clark (PC) algorithm, and Fast Causal Inferences (FCI).
- Obtained a final graph using the majority voting approach following Joe et al.(2023)
- Carefully reviewed and adjusted the graph to align better with real-world expertise, simplifying complex relationships.

- The derived DAG served as a valuable tool for generating hypotheses and guiding the analysis process.AND helped in selecting relevant control variables for the analysis based on the identified relationships.



4.2. Descriptive Results

Table 1 provides a baseline comparison of Non-Expansion and Expansion states before and after the implementation of the Affordable Care Act (ACA). The table displays mean values for three variables: State's Political Liberalism, Immigration Policy Climate, and State's Unemployment Rate.

Table 1: Baseline Comparison of States

Group	Variable	Expansion	Non Expansion	Difference
Pre-ACA	State's Political Liberalism	0.45 (0.17)	0.24 (0.09)	**0.22*** **
	Immigration Policy Climate	-1 (2)	-3 (1)	**2.1*** **
	State's Unemployment Rate	8.60 (1.64)	7.16 (2.02)	**1.4*** **
Post-ACA	State's Political Liberalism	0.47 (0.22)	0.23 (0.10)	**0.24*** **
	Immigration Policy Climate	0 (3)	-3 (1)	**2.8*** **
	State's Unemployment Rate	5.00 (1.14)	4.50 (1.15)	**0.50*** **

[1] Mean (SD)

[2] *p<0.05;* ***p<0.01;*** p<0.001

Key Observations:

- Before the ACA went into effect, there were notable differences between Expansion and Non-Expansion states.
- Expansion states tended to be more politically liberal.
- Expansion states had less exclusionary immigration policies.
- Expansion states had higher levels of unemployment.
- Implementation of the ACA did not significantly impact the differences in State's Political Liberalism, Immigration Policy Climate, and State's Unemployment Rate between Expansion and Non-Expansion states.

Table 2 gives a detailed look at demographics, insurance rates, and Medicaid coverage before the Affordable Care Act. It compares foreign-born and US-born individuals in states with and without Medicaid expansion.

Table 2: Baseline Characteristics by Nativity

Characteristic	Expansion			Non-expansion		
	Foregin-born, N = 11592215	**US-born**, N = 34946509	**p-value**	**Foregin-born**, N = 7113051	**US-born**, N = 26041282	**p-value**
Uninsured, %	56	34	<0.001	70	42	<0.001
Medicaid coverage, %	25	38	<0.001	12	30	<0.001
Age, Mean (SD)	42 (10)	44 (11)	<0.001	41 (10)	44 (11)	<0.001
Race/ethnicity, %			<0.001			<0.001
Asian	15	0.8		7.3	0.2	
Black	4.3	20		7.9	28	
Hispanic	68	11		76	10	
Other	1.8	4.3		1.5	3.2	
White	11	64		7.6	58	
Sex, %			<0.001			<0.001
Female	55	57		54	58	
Male	45	43		46	42	
Married, %	56	28	<0.001	58	31	<0.001
Employment status, %			<0.001			<0.001
Employed	53	38		57	40	
Not in labor force	35	47		33	46	
Unemployed	11	15		9.8	14	
Education, %			<0.001			<0.001
College degree	6.9	8.2		6.6	7.2	
Graduate and beyond	2.8	2.8		2.4	2.2	
High school	24	36		26	36	
Less than high school	51	20		50	22	
Some college or Associate degree	15	33		15	32	
Federal poverty, %			<0.001			<0.001
Income 100 to 138% poverty	37	31		36	32	
Income below 100% poverty	63	69		64	68	
Disability, %	9.8	27	<0.001	9.3	27	<0.001

[1] chi-squared test with Rao & Scott's second-order correction; Wilcoxon rank-sum test for complex survey samples

Key Observations:

- Notable demographic variations exist when comparing foreign-born and US-born adults, regardless of Medicaid expansion status.

- Baseline data shows minimal or negligible differences in characteristics of foreign-born individuals between expansion and non-expansion states.
- At the baseline, characteristics of native-born individuals exhibit either no differences or slight variations between expansion and non-expansion states.

Table 3, provides a comprehensive view of uninsured individuals' characteristics, along with those covered by Medicaid, before and after the implementation of the Affordable Care Act (ACA) in both Medicaid expansion and non-expansion states.

It shows changes in uninsured and Medicaid-covered groups post-ACA. and provides context on the ACA's impact across different state contexts.

Table 3: Charachterstics of Uninsured and Medicaid Covered Low Income Indiduals, expansion vs non-expansion

	Uninsured Rate				Medicaid Coverage			
	Expansion		Non-expansion		Expansion		Non-expansion	
Characteristic	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Nativity, %								
Foregin-born	36	32	28	27	17	17	9.1	8.8
US-born	64	68	72	73	83	83	91	91
Race/ethnicity, %								
Asian	3.8	4.2	1.7	1.9	4.2	3.7	1.1	0.9
Black	10	11	17	19	14	17	28	31
Hispanic	35	31	32	29	19	19	14	13
Other	6.1	4.9	3.8	3.4	5.8	6.1	4.0	3.9
White	45	49	46	46	56	54	54	51
Sex, %								
Female	50	52	55	55	61	63	63	64
Male	50	48	45	45	39	37	37	36
Employment status, %								
Employed	49	46	48	47	34	27	25	22
Not in labor force	39	34	40	35	56	60	67	67
Unemployed	12	19	12	18	9.9	13	7.6	11
Marital status, %	35	37	37	39	32	33	29	30
Education, %								
College degree	6.9	6.8	5.9	6.1	6.7	4.6	5.1	4.0
Graduate and beyond	2.4	2.1	1.8	1.7	2.2	1.3	1.5	1.1
High school	34	34	36	35	35	35	37	35
Less than high school	33	31	32	32	25	30	28	32
Some college or Associate degree	23	26	25	26	30	29	29	27
Federal poverty, %								
Income 100 to 138% poverty	32	32	30	31	28	25	26	25
Income below 100% poverty	68	68	70	69	72	75	74	75
Disability, %	12	13	16	15	34	40	45	48

Table 4 presents the shifts in characteristics unique to foreign-born individuals before and after the enactment of the Affordable Care Act (ACA) in both Medicaid expansion and non-expansion states.

Table 4: Changes in Foreign-Born-Specific Characteristics Before and After the Affordable Care Act (ACA) in Expansion and Non-Expansion States

	Expansion			Non-expansion		
Characteristic	**Pre-ACA**	**Post-ACA**	**Difference**	**Pre-ACA**	**Post-ACA**	**Difference**
Insurance coverage, %						
Uninsured	53	33	20%***	67	54	13%***
Medicaid coverage	27	43	-17%***	14	16	-2.7%***
Individualy Purchased	5.4	8.3	-2.9%***	5.0	13	-8.0%***
Employer Sponsered	15	16	-0.90%***	14	17	-3.0%***
Citizenship status, %						
Naturalized citizen	33	38	-5.0%***	29	34	-4.5%***
Non citizen	63	58	5.7%***	66	61	5.3%***
US citizen Born abroad	3.3	4.0	-0.68%***	4.3	5.1	-0.85%***
Lifetime in US, %						
Less than 25%	17	14	3.2%***	20	16	3.7%***
More than 25%	83	86	-3.2%***	80	84	-3.7%***
Self-rated English proficiency, %						
Not at all	16	13	2.6%***	16	14	1.7%***
Not well	32	29	3.4%***	30	27	2.8%***
Only english	9.6	11	-1.8%***	12	13	-1.2%***
Very well	19	23	-3.7%***	20	22	-2.6%***
Well	23	24	-0.56%**	22	23	-0.66%**
Country/Region of birth, %						
Canada	1.0	1.0	-0.07%	1.1	1.0	0.07%
Eastern Asia	5.8	6.5	-0.72%***	2.3	2.9	-0.53%***
Eastern Europe	2.3	2.4	-0.12%	1.2	1.2	-0.05%
Latin America	68	64	4.1%***	80	77	2.7%***
Middle East	3.8	4.8	-1.0%***	1.9	2.4	-0.47%***
Oceania and at Sea	0.6	0.7	-0.04%	0.3	0.3	-0.01%
South Centeral Asia	2.6	3.5	-0.87%***	2.1	2.5	-0.38%***
South East Asia	9.5	9.9	-0.33%**	4.5	5.0	-0.54%***
Sub Saharan Africa	2.4	3.0	-0.65%***	2.1	2.7	-0.51%***
Western Europe	3.7	4.1	-0.33%***	4.3	4.6	-0.28%*

[1] %

[2] *p<0.05;* ***p<0.01;*** p<0.001

Key Observations:

- With the exception of insurance coverage, the foreign-born-specific characteristics remain consistent over time and exhibit minimal differences between expansion and non-expansion states.

4.3. Event Study

4.3.1. Uninsured Rate: In Figure 1, Event-study estimates for uninsured rates are displayed.

Panel (a): Focuses on expansion effects on uninsured for both US-born and foreign-born individuals without control variables. Panel (b): Examines expansion effects while controlling for covariates. Black line with circles: Represents foreign-borns. Purple line with triangles: Represents US-born.

Figure 1

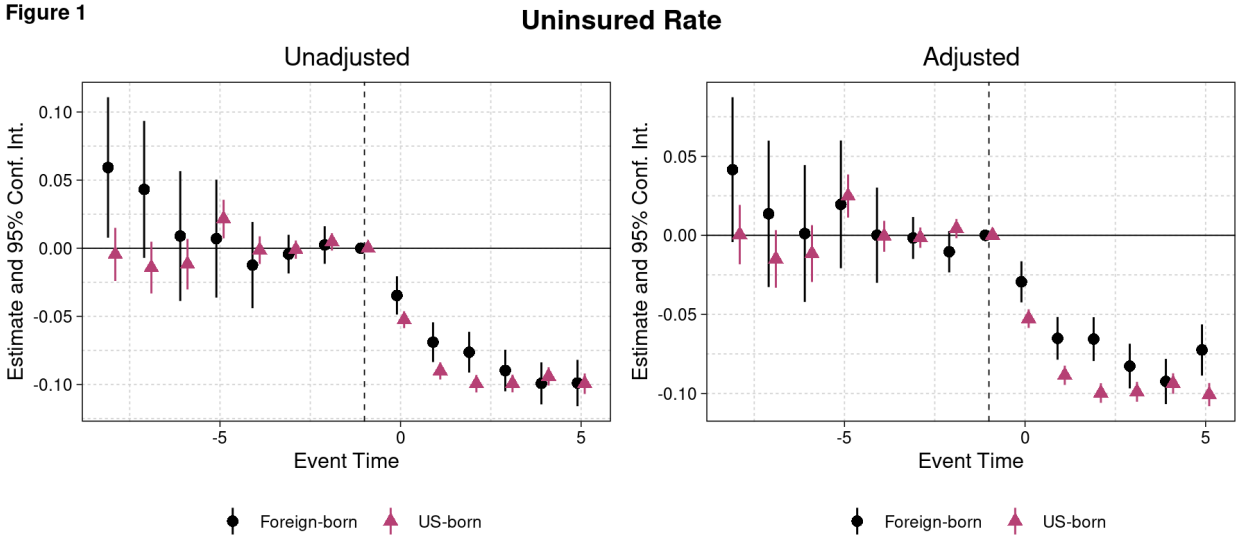


Table 5: The Impact of Medicaid Expansion on Uninsured Rate

	US-born		Foreign-Born	
Variables	(1)	(2)	(3)	(4)
expansion year = -8	-0.005	0.0005	0.059*	0.042
	(0.021)	(0.024)	(0.030)	(0.024)
expansion year = -7	-0.014	-0.015	0.043	0.014
	(0.025)	(0.027)	(0.028)	(0.022)
expansion year = -6	-0.012	-0.011	0.009	0.001
	(0.019)	(0.022)	(0.026)	(0.025)
expansion year = -5	0.021*	0.025**	0.007	0.020
	(0.011)	(0.010)	(0.018)	(0.016)
expansion year = -4	-0.001	-0.0006	-0.012	9.83×10^{-5}
	(0.017)	(0.017)	(0.016)	(0.016)
expansion year = -3	-0.001	-0.001	-0.004	-0.002
	(0.004)	(0.005)	(0.010)	(0.007)
expansion year = -2	0.005	0.004	0.002	-0.010*
	(0.003)	(0.004)	(0.008)	(0.005)
expansion year = 0	-0.052***	-0.053***	-0.035***	-0.029**
	(0.005)	(0.005)	(0.008)	(0.011)
expansion year = 1	-0.090***	-0.088***	-0.069**	-0.065**
	(0.008)	(0.008)	(0.024)	(0.022)
expansion year = 2	-0.100***	-0.100***	-0.076**	-0.066**
	(0.009)	(0.009)	(0.026)	(0.026)
expansion year = 3	-0.099***	-0.099***	-0.090**	-0.083**
	(0.008)	(0.008)	(0.028)	(0.025)
expansion year = 4	-0.094***	-0.094***	-0.099**	-0.092***
	(0.009)	(0.009)	(0.030)	(0.028)
expansion year = 5	-0.100***	-0.101***	-0.099***	-0.072**
	(0.009)	(0.009)	(0.026)	(0.027)
State FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Controls		yes		yes
Observations	1,585,639	1,585,639	389,955	389,955
R^2	0.05930	0.11978	0.08577	0.21554
Within R^2	0.00286	0.06697	0.00172	0.14342

Clustered (State & Year) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Key Observations:

- Consistent Pre-Trend Patterns:
  - For US-born individuals in expansion vs. non-expansion states; coefficients not significantly different from zero.
  - Coefficients for interaction terms between year and pre-treatment indicator are small and not statistically significant.
- Witness notable, statistically significant declines in uninsured rates for both groups in Post-expansion years
- Notable contrast in lead coefficient shifts for foreign-born compared to native individuals, signaling disparities between these groups.

4.3.2. Medicaid Coverage Figure 2 and Table 2, display event-study estimates for unconditional and conditional parallel trends in Medicaid take-up.

Figure 2

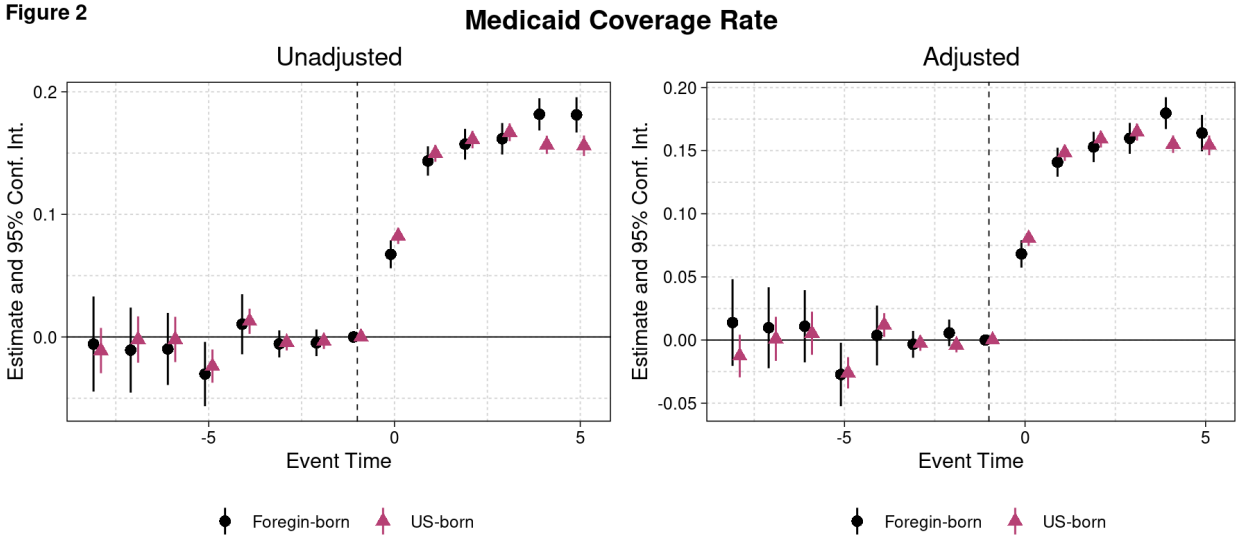


Table 6: The Impact of Medicaid Expansion on Medicaid Coverage

	US-born		Foreign-Born	
Variables	(1)	(2)	(3)	(4)
expansion year = -8	-0.011	-0.013	-0.006	0.014
	(0.029)	(0.031)	(0.009)	(0.010)
expansion year = -7	-0.002	0.0010	-0.011	0.010
	(0.031)	(0.031)	(0.013)	(0.011)
expansion year = -6	-0.002	0.005	-0.010	0.011
	(0.021)	(0.024)	(0.011)	(0.011)
expansion year = -5	-0.024	-0.026*	-0.030***	-0.027***
	(0.014)	(0.013)	(0.008)	(0.007)
expansion year = -4	0.013	0.012	0.010	0.004
	(0.015)	(0.015)	(0.017)	(0.010)
expansion year = -3	-0.004	-0.002	-0.006	-0.003
	(0.003)	(0.003)	(0.006)	(0.006)
expansion year = -2	-0.003	-0.004	-0.005	0.006
	(0.004)	(0.004)	(0.007)	(0.006)
expansion year = 0	0.082***	0.081***	0.067***	0.068***
	(0.004)	(0.005)	(0.002)	(0.005)
expansion year = 1	0.150***	0.148***	0.144***	0.141***
	(0.011)	(0.011)	(0.013)	(0.012)
expansion year = 2	0.161***	0.159***	0.157***	0.153***
	(0.011)	(0.012)	(0.017)	(0.014)
expansion year = 3	0.167***	0.165***	0.162***	0.160***
	(0.011)	(0.012)	(0.017)	(0.014)
expansion year = 4	0.157***	0.155***	0.182***	0.180***
	(0.010)	(0.010)	(0.018)	(0.019)
expansion year = 5	0.156***	0.154***	0.181***	0.164***
	(0.011)	(0.011)	(0.017)	(0.017)
State FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Controls		yes		yes
Observations	1,585,639	1,585,639	389,955	389,955
R^2	0.06514	0.18770	0.10655	0.18067
Within R^2	0.00628	0.13656	0.00837	0.09064

Clustered (State & Year) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Key Observations:

- No Pre-Trend Differences: Before Medicaid expansion, no significant differences observed in Medicaid take-up between expansion and non-expansion states for low-income US-born and foreign-born individuals (26-64).
- Interaction term coefficients small and statistically insignificant, indicating no pre-trend disparity in uninsured rates between expansion and non-expansion states.
- Coefficients for post-treatment years (0 to 5 after expansion) positive and statistically significant in all models, showing increased Medicaid coverage in expansion states.
- Observed divergence in Take-Up Trends: Over time, foreign-born individuals' Medicaid take-up increased, differing from US-born individuals; potential factors include policy changes, targeted outreach, or specific programs.

- Demonstrates Medicaid expansion's effectiveness in enhancing healthcare access, particularly among foreign-born individuals.

4.4. Difference-in-Differences

Uninsured Rate

Table 7: The Effect of Medicaid Expansion on Uninsured Rate (Difference-in-Differences Estimation)

	(1)	(2)	(3)	(4)	(5)
Medicaid Expansion	-0.075***	-0.081***	-0.092***	-0.084***	-0.095***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Foreign-Born	0.244***	0.018*	1.10***	0.051***	0.995***
	(0.001)	(0.010)	(0.062)	(0.014)	(0.074)
Medicaid Expansion × Foreign-Born	-0.031***	0.0010	0.004*	0.017***	0.021***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
State Political Ideology		-0.028***	-0.003	-0.018**	0.007
		(0.007)	(0.008)	(0.007)	(0.008)
Foreign-Born × State Political Ideology				-0.089***	-0.092***
				(0.006)	(0.006)
Controls x Foreign-born	No	No	No	Yes	Yes
Controls		yes	yes	yes	yes
State and Year FE	yes	yes	yes	yes	yes
Region-Year FE			yes		yes
Standard-Errors	Heteroskedasticity-robust				
Observations	1,975,594	1,975,594	1,975,594	1,975,594	1,975,594
R^2	0.10174	0.17712	0.17423	0.17820	0.17689
Within R^2	0.04288	0.12320	0.11887	0.12435	0.12171

Heteroskedasticity-robust standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Key Observations:

- Model 4 stands out as the best-fitting model according to R2 results.
- The incorporation of interaction terms for control variables differing between foreign-born and native individuals appears to have enhanced model fit.
- Medicaid Expansion notably reduced the probability of being uninsured.
- Being foreign-born correlates with an increased chance of being uninsured, though the extent varies across different models.
- The significance and direction of coefficients for Medicaid Expansion x Foreign-Born interactions differ across models.
  - In Model 1, the negative and significant coefficient implies a smaller uninsured probability for foreign-born individuals compared to US-born.
  - In Model 2, the coefficient lacks significance, suggesting no distinct difference in uninsured probabilities.
  - In Models 3 to 5, the positive coefficient signifies a reduced impact of Medicaid expansion on decreasing the uninsured rate for foreign-born individuals relative to US-born individuals.
- Model 3 features a coefficient exceeding 1, rendering it unsuitable for meaningful interpretation due to the linear probability framework's limitations.
- While the heatmap hinted at differences in outcomes by region and year, adding a Region-year fixed effect in the later analysis didn't show any clear improvements in model fit.

Medicaid Coverage

Table 8: The Effect of Medicaid Expansion on Uninsured Rate (Difference-in-Differences Estimation)

	(1)	(2)	(3)	(4)	(5)
Medicaid Expansion	0.136***	0.140***	0.148***	0.144***	0.151***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Foreign-Born	-0.158***	-0.098***	0.011	0.012	0.192***
	(0.001)	(0.010)	(0.059)	(0.014)	(0.071)
Medicaid Expansion × Foreign-Born	0.007***	-0.012***	-0.015***	-0.032***	-0.036***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
State Political Ideology		-0.010	-0.049***	-0.023***	-0.062***
		(0.008)	(0.008)	(0.008)	(0.008)
Foreign-Born × State Political Ideology				0.105***	0.108***
				(0.006)	(0.006)
Controls x Foreign-born	No	No	No	Yes	Yes
Controls		yes	yes	yes	yes
State and Year FE	yes	yes	yes	yes	yes
Region-Year FE			yes		yes
Standard-Errors	Heteroskedasticity-robust				
Observations	1,975,594	1,975,594	1,975,594	1,975,594	1,975,594
R^2	0.08522	0.19213	0.19214	0.19494	0.19386
Within R^2	0.02242	0.13666	0.13407	0.13967	0.13591

Heteroskedasticity-robust standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Key Observations:

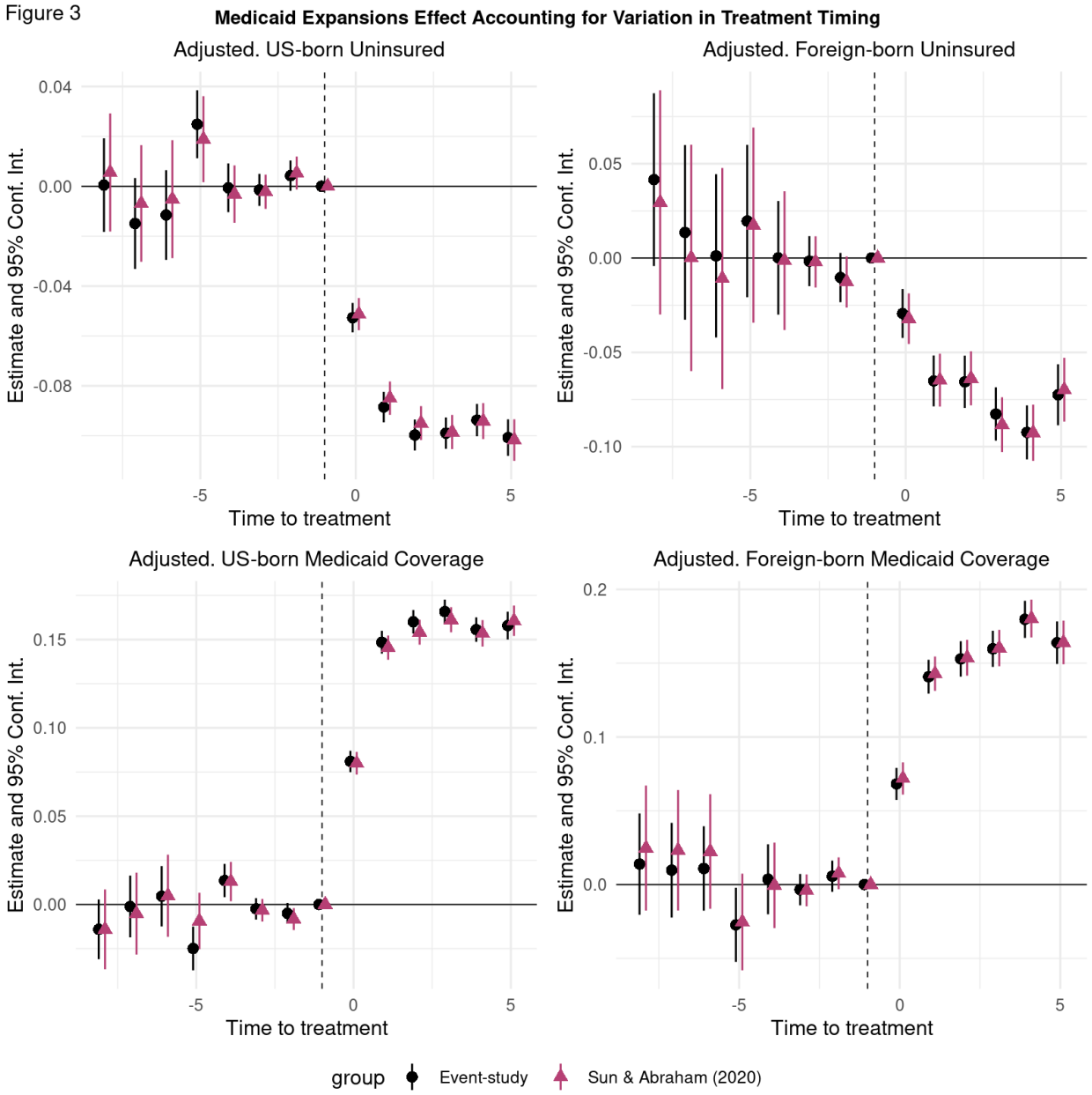
- The incorporation of interaction terms for control variables differing between foreign-born and native individuals appears to have enhanced model fit.
- Model 4 stands out as the best-fitting model according to R2 results.
- Medicaid Expansion notably increased the probability of having medicaid coverage for low income aged 26-64.

- In Model 1 and 2, the coefficient for "Foreign-Born" is negative, indicating that being foreign-born is associated with a decrease in the probability of having Medicaid coverage However, in subsequent models (Model 4 and Model 5), the coefficient for "Foreign-Born" becomes positive (0.011 to 0.192). This implies that the effect of being foreign-born on Medicaid coverage is not consistently negative and could be postive or have no effect based on other factors in the model.
- The interaction effect term "Medicaid Expansion x Foreign-Born" suggests that the impact of Medicaid Expansion on Medicaid coverage changes based on foreign-born status. Model indicating a slight increase in the impact of Medicaid Expansion for foreign-born individuals However, in subsequent models (Model 3 to Model 5), the coefficient becomes negative (-0.015 to -0.036). This suggests that the effect of Medicaid Expansion diminishes for foreign-born individuals as other factors are considered.
- Being foreign-born correlates with the chance of having a med, though the extent varies across different models.
- The significance and direction of coefficients for Medicaid Expansion x Foreign-Born interactions differ across models.
  - In Model 1, the negative and significant coefficient implies a smaller uninsured probability for foreign-born individuals compared to US-born.
  - In Model 2, the coefficient lacks significance, suggesting no distinct difference in uninsured probabilities.
  - In Models 3 to 5, the positive coefficient signifies a reduced impact of Medicaid expansion on decreasing the uninsured rate for foreign-born individuals relative to US-born individuals.
- Model 3 features a coefficient exceeding 1, rendering it unsuitable for meaningful interpretation due to the linear probability framework's limitations.
- While the heatmap hinted at differences in outcomes by region and year, adding a Region-year fixed effect in the later analysis didn't show any clear improvements in model fit.

4.5. Addressing Threat of Treatment Heterogenity

4.5.1. Sun & Abraham Interaction-weighted (IW) event study Since 2018, there's been a growing focus on validating staggered Difference-in-Differences (DID) models and event study designs.To address these concerns and account for heterogeneous treatment effects, we use the interaction-weighted (IW) event study estimator by Sun and Abraham (2021).

Figure 3



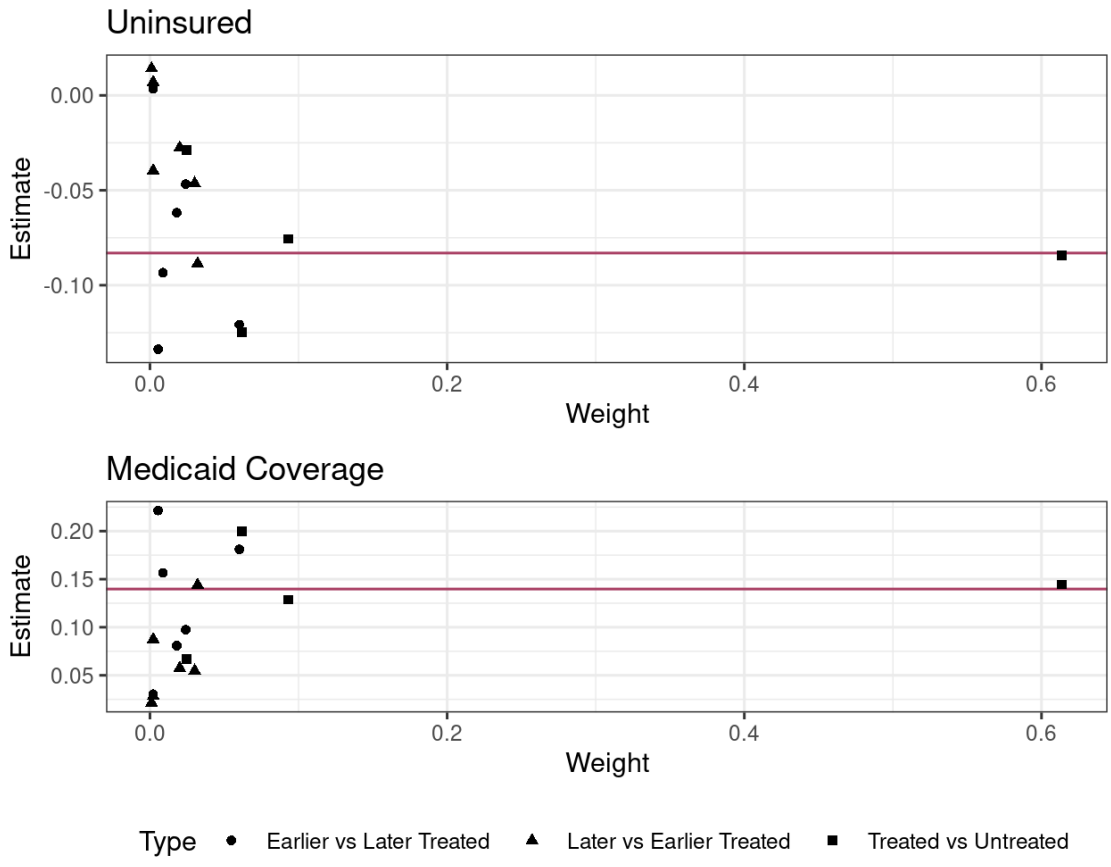
- No evidence of differing pre-trends is found, we can conclude our results are robust and not disproportionately influenced by variations in treatment effects across diverse cohorts.

4.5.2. Bacon decomposition

- Compares timing groups to untreated units and evaluates relative treatment effects at different timings.

Table 9: Bacon Decomposition

Comparison	Coefficient	Weight
Uninsured		
Earlier vs Later Treated	-0.09309	0.11871
Later vs Earlier Treated	-0.05521	0.08771
Treated vs Untreated	-0.08462	0.79358
Medicaid		
Earlier vs Later Treated	0.14610	0.11871
Later vs Earlier Treated	0.08782	0.08771
Treated vs Untreated	0.14452	0.79358



- When we exclude variation due to state-level treatment timing differences:

  - Difference-in-Differences (DD) estimate remains highly consistent with main DD estimate.
  - Treatment effect magnitude from 2014 wave aligns with subsequent wave effects.

- Result Confirms the reliability of the estimated treatment effect.

- Figure 4 illustrates 2 $\times$ 2 DD estimates and associated weights.