



Relationship between conflict and labor market in the deep South of Thailand

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Presentation's Outline

1. Introduction and Background
2. Labour Market in The Deep South
3. Panel VAR Study
4. Synthetic Control Approach
5. Conclusion

Introduction & Background

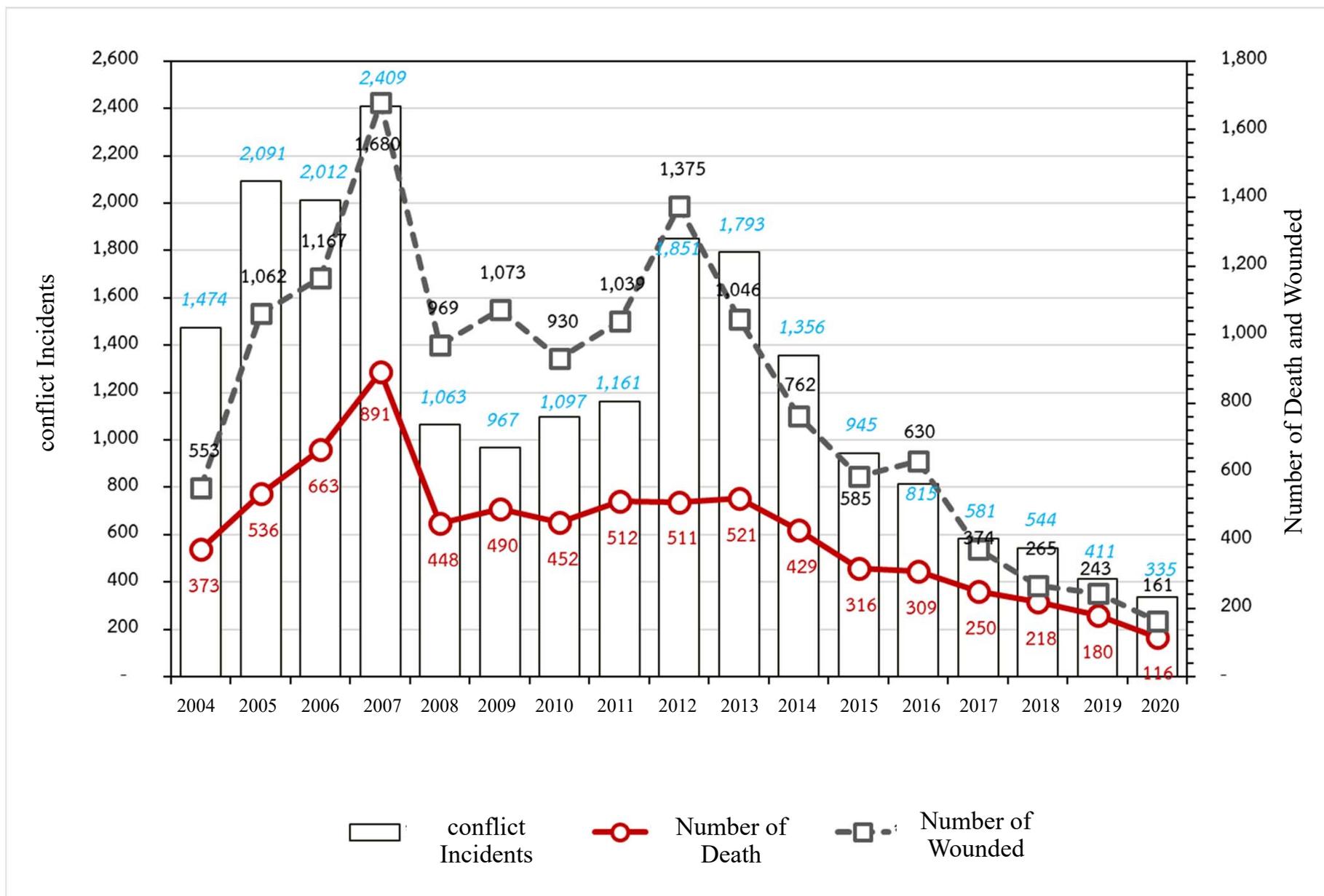
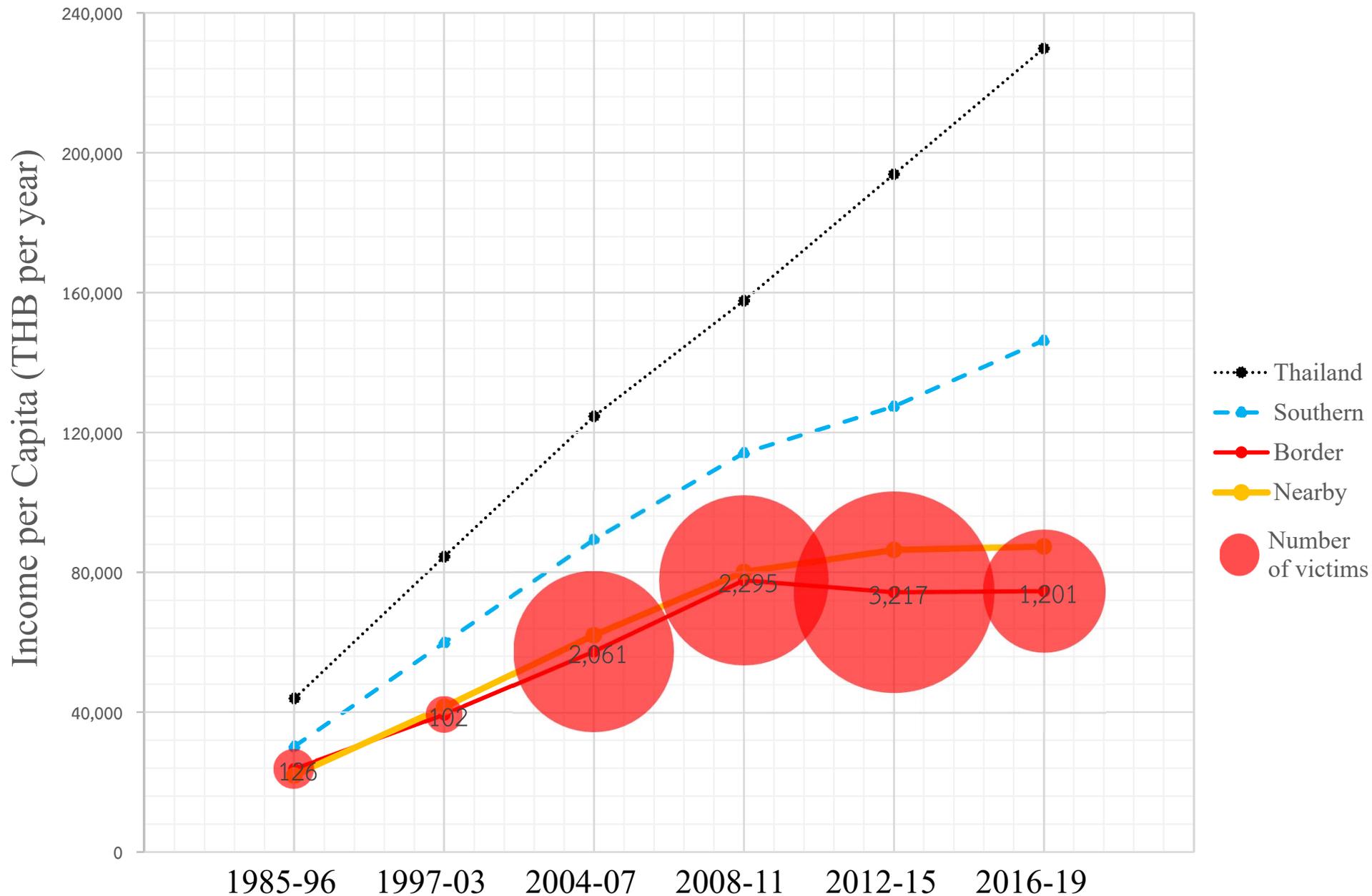


Figure 1. Annual conflict Incidents, number of death and wounded during 2004-2020

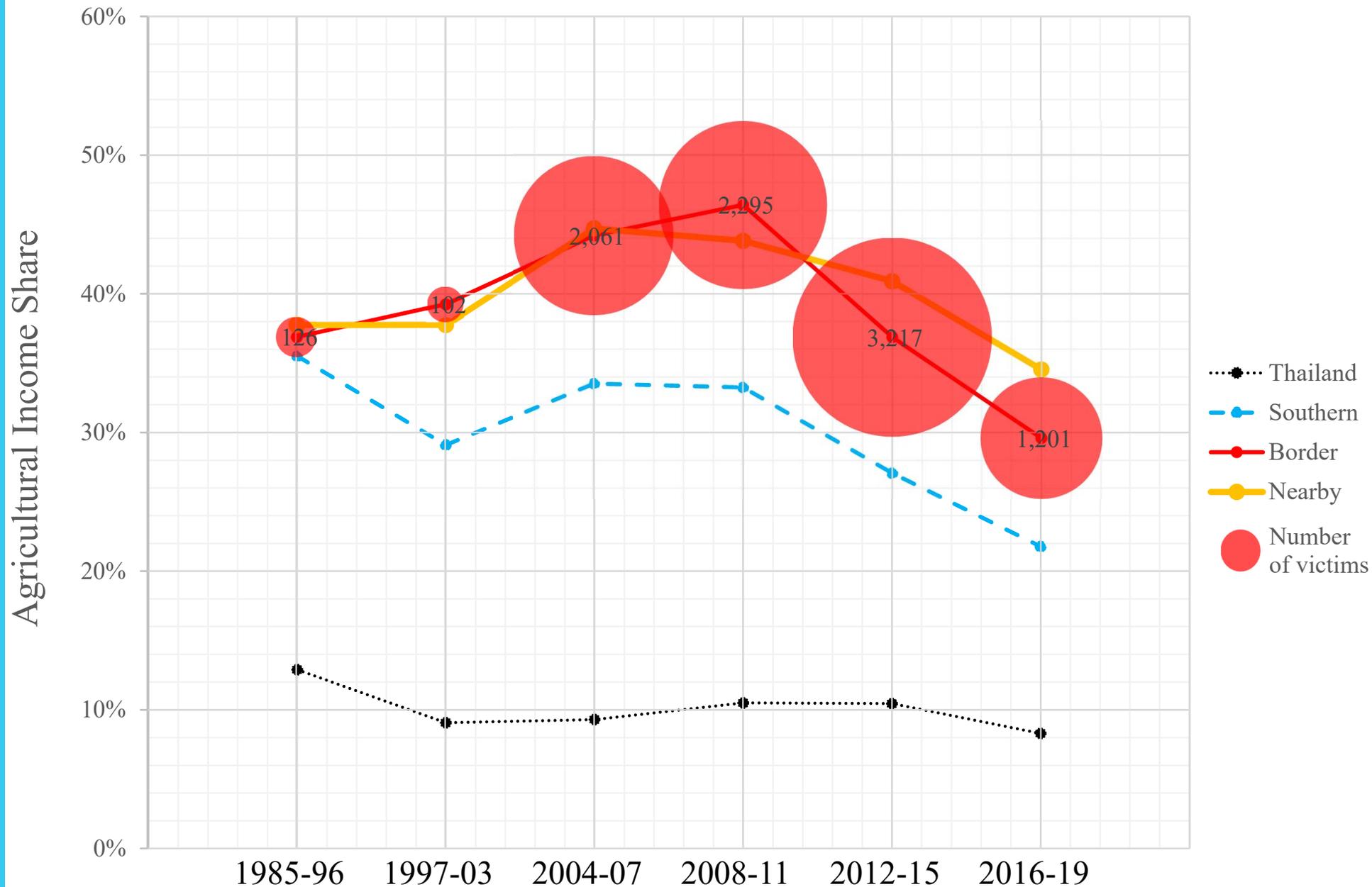
Labour Market in The Deep South

Income per capita in Border and Nearby provinces had similar development



Labour Market in The Deep South

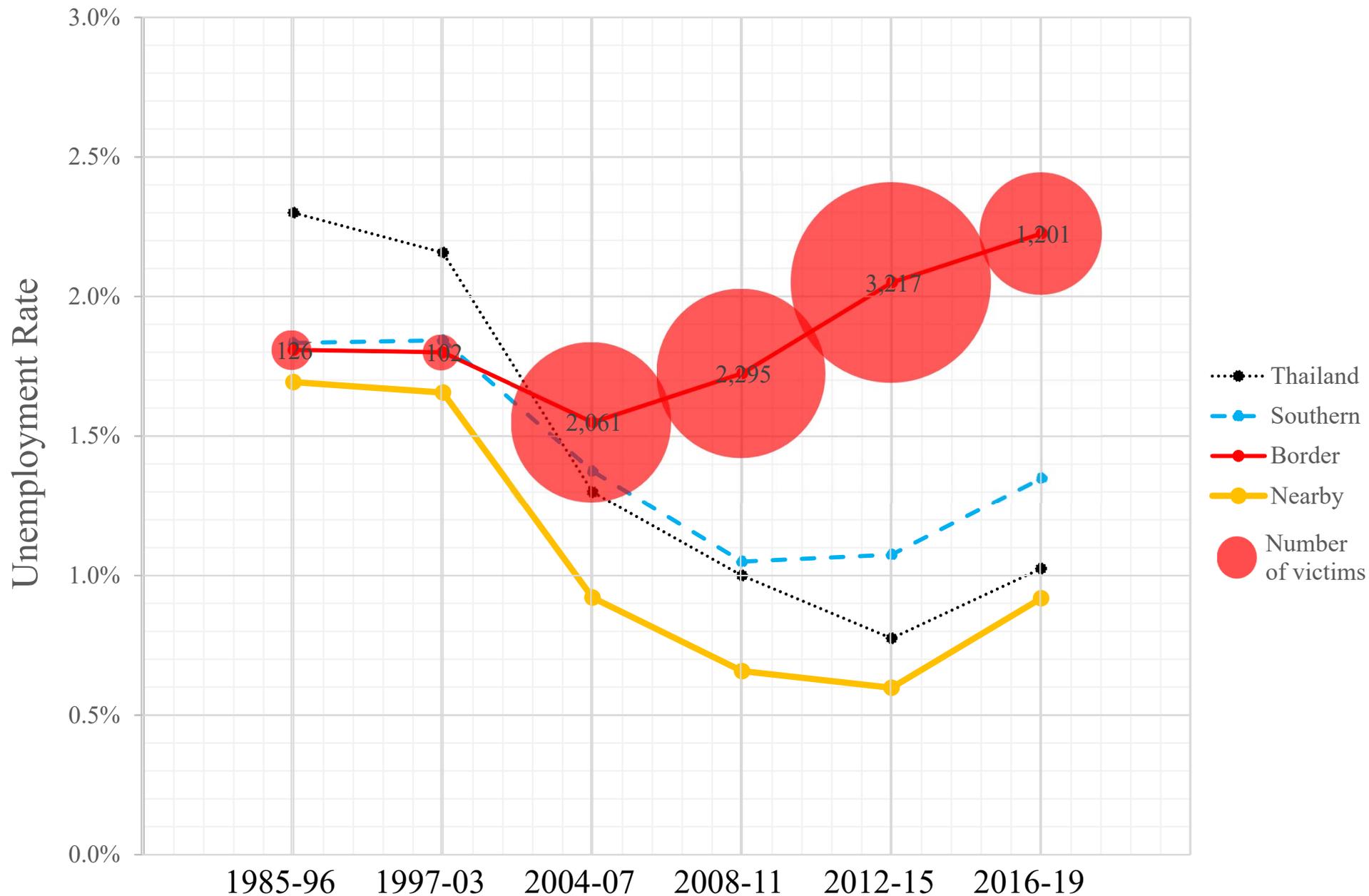
GPP's agriculture share in Border and Nearby provinces had similar pace



Source : National Economic and Social Development Council's Gross Regional and Provincial Product and University of Marryland's Global Terrorism Database

Labour Market in The Deep South

Unemployment Rate in Border provinces had significantly increased

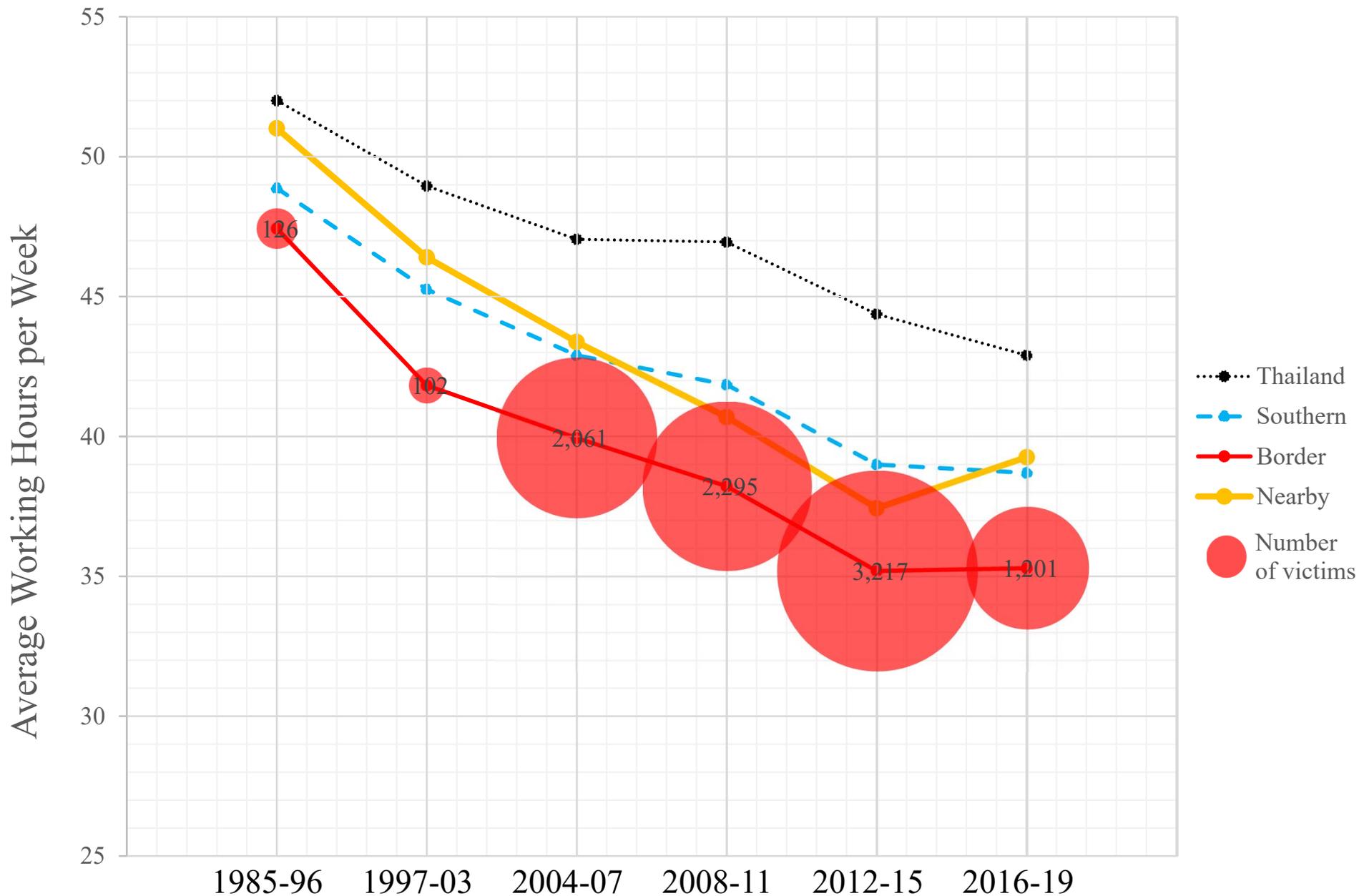


Source : National Statistical Office's Labor Force Survey (third quarter of each year) and University of Marryland's Global Terrorism Database

Remark : Labor Force was revised to cover persons with the age of 15 years, instead of 13 years, and over since 2001. Since 2014, the survey has changed estimation to be based on the population census 2010.

Labour Market in The Deep South

Working hours per week had continually been lower in Border provinces

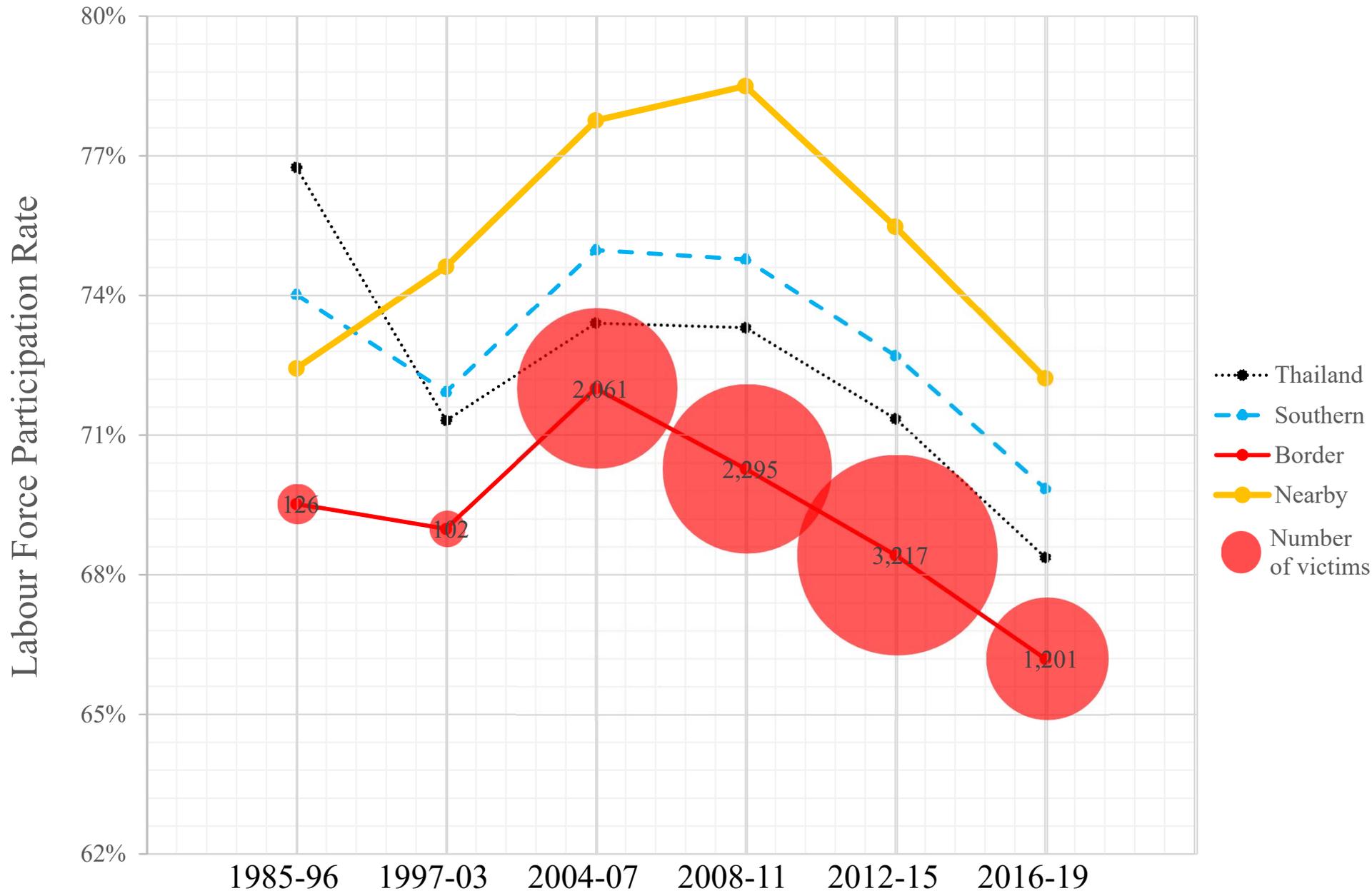


Source : National Statistical Office's Labor Force Survey (third quarter of each year) and University of Maryland's Global Terrorism Database

Remark : Labor Force was revised to cover persons with the age of 15 years, instead of 13 years, and over since 2001. Since 2014, the survey has changed estimation to be based on the population census 2010.

Labour Market in The Deep South

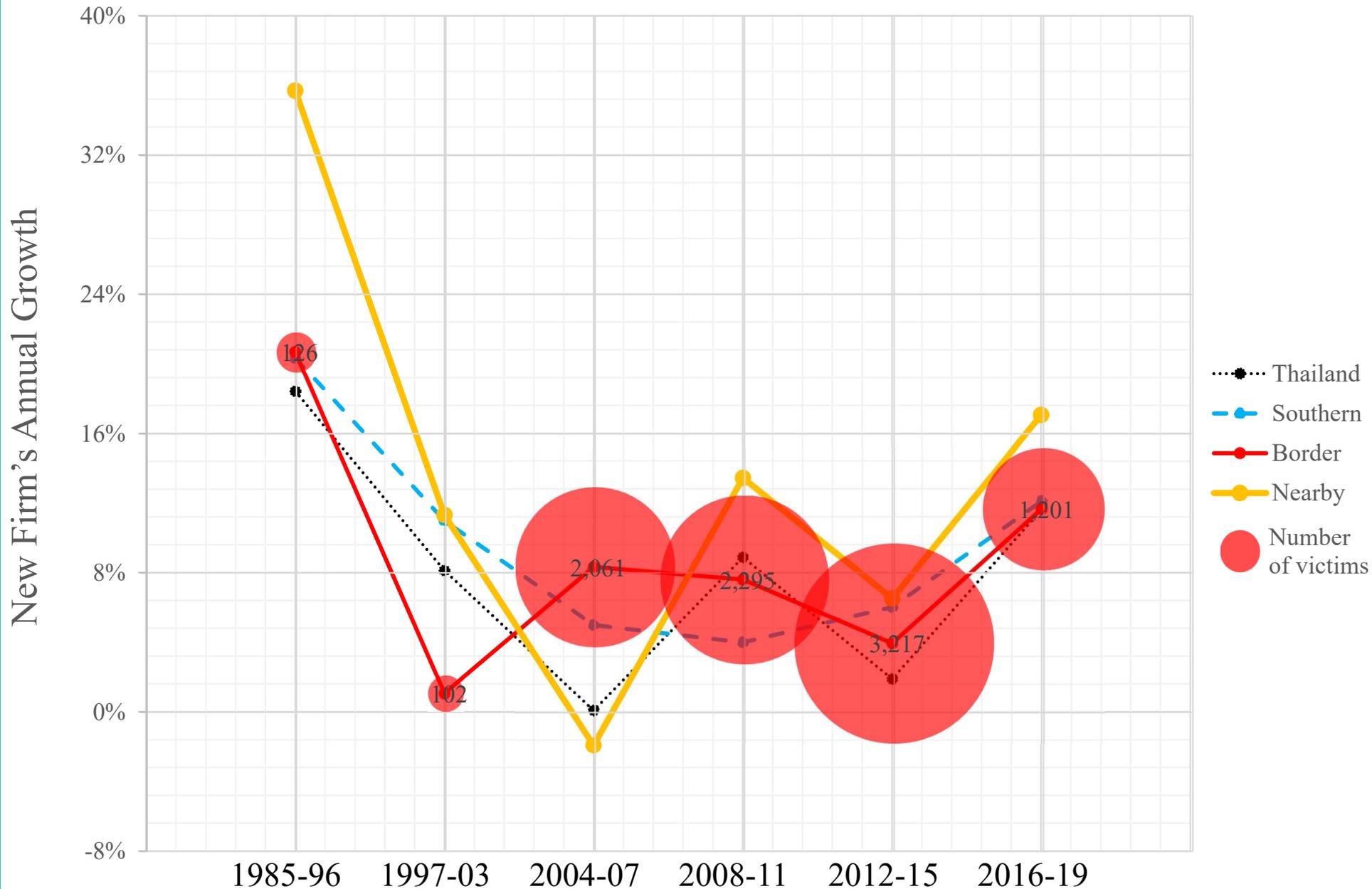
Labour force participation had continually been lower in Border provinces



Source : National Statistical Office's Labor Force Survey (third quarter of each year) and University of Maryland's Global Terrorism Database
 Remark : Labor Force was revised to cover persons with the age of 15 years, instead of 13 years, and over since 2001. Since 2014, the survey has changed estimation to be based on the population census 2010.

Labour Market in The Deep South

New business registration in the Border and Nearby provinces had quite similar dynamics



Source : Ministry of Commerce's Department of Business Development and University of Maryland's Global Terrorism Database
 Remark : Data before 2018 are compiled from the firm-level database. Since 2018, data are from the aggregate report based on province-level.

Panel VAR Study

Methodology and Data

Panel VAR combines the VAR method (dynamic relationship between endogenous variables) with the panel data method (unobserved district-specific heteroskedasticity)

No a priori theory regarding the causal relationship between **conflict activities** and **labor markets**

$$y_{it} = \beta y_{it-1} + \gamma z_{it} + a_i + d_t + \varepsilon_{it}$$

where $y_{it} = (Labor_{it}, Conflict_{it})$

z_{it} is controlled macroeconomic variable,
 a_i denotes unobserved district-specify heterogeneity,
 d_t denotes time-effects;
 ε_{it} is an idiosyncratic error term.

Panel VAR Study

Methodology and Data

- The sample of 37 districts between 2003 and 2019.
- Quarterly collected.
- Conflicts - three conflict indicators: the number of events, the number of wounded victims, and the number of fatalities from GTD (LaFree and Dugan, 2007).
- Unemployment data :
 - National Statistical Office's (NSO) Labor force survey,
 - Social Security Office (SSO).

Panel VAR Study

Results – NSO Unemployment & Conflict

	Model 1			Model 2	
	Unemployment Rate	Number of Events Per cap		Unemployment Rate	Number of wounds Per cap
Lag of Unemployment rate	0.130*** [0.046]	-0.015 [0.075]	Lag of Unemployment rate	0.131*** [0.045]	0.066 [0.263]
Lag of Number of events per cap	-0.023** [0.010]	0.309** [0.133]	Lag of Number of wounds per cap	0.012 [0.016]	0.251 [0.217]
Percentage change of deposit per cap	-0.339** [0.148]	2.635* [1.401]	Percentage change of deposit per cap	-0.247 [0.145]	5.153 [3.767]
Year Dummies	Yes	Yes	Year Dummies	Yes	Yes
N	2073 [panel = 37]		N	2073 [panel = 37]	

Notes: Standard deviation are in square brackets. *, **, *** indicate significance at 10, 5, and 1% level, respectively.

- Number of wounds per capita – inconsistent with a theoretical explanation
- No Granger causality between the number of events, deaths, injuries, and unemployment.

Panel VAR Study

Results – NSO Working Hours & Conflict

	Model 1		Model 2		Model 3			
	Hours per LF	Number of Event Per cap	Lag of Hours per LF	Hours per LF	Number of wounds Per cap	Lag of Hours per LF	Hours per LF	Number of kills Per cap
Lag of Hours per LF	0.422*** [0.052]	2.209 [1.362]		0.423*** [0.051]	6.955** [2.802]		0.422*** [0.052]	1.397 [1.323]
Lag of Number of event per cap	-0.0003 [0.001]	0.305** [0.133]	Lag of Number of wounds per cap	-0.0004 [0.0005]	0.246 [0.217]	Lag of Number of kills per cap	-0.0003 [0.001]	0.177 [0.110]
Percentage change of deposit per cap	0.009 [0.020]	2.671* [0.133]	Percentage change of deposit per cap	0.008 [0.020]	5.267 [3.730]	Percentage change of deposit per cap	0.009 [0.020]	1.681* [0.937]
Year Dummies	Yes	Yes	Year Dummies	Yes	Yes	Year Dummies	Yes	Yes
N	2073 [panel = 37]							

Notes: Standard deviation are in square brackets. *, **, *** indicate significance at 10, 5, and 1% level, respectively.

The correlation between an increase in events, injuries, or fatalities per capita and average work hours is statistically insignificant

Panel VAR Study

Results – SSO Unemployment & Conflict

	Model 1		Model 2			Model 3		
	SSO Unemployment Rate	Number of Event Per cap	Lag of SSO Unemployment rate	SSO Unemployment Rate	Number of wounds Per cap	Lag of SSO Unemployment rate	SSO Unemployment Rate	Number of kills Per cap
Lag of SSO Unemployment rate	0.124*** [0.039]	-0.188 [0.371]	Lag of SSO Unemployment rate	0.125*** [0.039]	-1.041 [1.021]	Lag of SSO Unemployment rate	0.125*** [0.039]	-0.422 [0.403]
Lag of Number of event per cap	0.001 [0.001]	0.316** [0.142]	Lag of Number of wounds per cap	0.0004** [0.0002]	0.253 [0.221]	Lag of Number of kills per cap	0.0008 [0.0008]	0.198* [0.120]
Percentage change of deposit per cap	0.001 [0.009]	2.657* [1.430]	Percentage change of deposit per cap	0.001 [0.009]	5.259 [3.851]	Percentage change of deposit per cap	0.0003 [0.009]	1.775* [0.951]
Year Dummies	Yes	Yes	Year Dummies	Yes	Yes	Year Dummies	Yes	Yes
N	1911 [panel = 34]							

Notes: Standard deviation are in square brackets. *, **, *** indicate significance at 10, 5, and 1% level, respectively.

- SSO unemployment rate responds statistically significantly positively to its lagged value and lag of the number of wounded victims.
- Conflict measures are not influenced by lagged of SSO unemployment rate.

Panel VAR Study

Results – SSO Number of Firms & Conflict

	Model 1		Model 2			Model 3		
	SSO Number of Firms	Number of Event Per cap	Lag of SSO Number of Firms	SSO Number of Firms	Number of Wounds Per cap	Lag of SSO Number of Firms	SSO Number of Firms	Number of kills Per cap
Lag of SSO Number of Firms	1.073*** [0.022]	0.003 [0.010]	Lag of SSO Number of Firms	1.073*** [0.022]	-0.026 [0.034]	Lag of SSO Number of Firms	1.073*** [0.022]	0.006 [0.011]
Lag of Number of event per cap	-0.011 [0.009]	0.315** [0.142]	Lag of Number of wounds per cap	-0.006** [0.002]	0.254 [0.221]	Lag of Number of kills per cap	-0.020** [0.008]	0.197 [0.120]
Percentage change of deposit per cap	0.129 [0.170]	2.657 [1.429]	Percentage change of deposit per cap	0.119 [0.169]	5.243 [3.857]	Percentage change of deposit per cap	0.123 [0.170]	1.775 [0.950]
Year Dummies	Yes	Yes	Year Dummies	Yes	Yes	Year Dummies	Yes	Yes
N	1911 [panel = 34]							

Notes: Standard deviation are in square brackets. *, **, *** indicate significance at 10, 5, and 1% level, respectively.

The number of firms is statistically negatively associated with the lag of the number of wounded victims and fatalities.

Synthetic Control Approach

Methodology and Data

Abadie and Gardeazabal (2003) and Abadie et al. (2010)

Let j ($j = 1, \dots, J+1$) be provinces, province $j=1$ be the province faced with economic impact from the conflict or the "treatment group", and provinces $j = 2, \dots, J+1$ be provinces that are not faced with the conflict or the "donor pool", the group of potential comparison units.

Let t ($t = 1, \dots, T$) be years, years $t = 1, \dots, T_0$ be the pre-conflict period, and years $T_0 + 1, \dots, T$ be the conflict period.

Synthetic Control Approach

The synthetic control method chooses W^* that minimizes

$$\sum_{m=1}^k v_m (X_{1m} - X_{0m}W)^2$$

v_m is the importance weight of characteristic m

X_{1m} is the explanatory variable of characteristic m for the treated unit

X_{0m} is the $1 \times J$ vector of the explanatory variable of characteristic m for the units in the donor pool.

$W = (w_2, \dots, w_{J+1})'$ be a $J \times 1$ vector of weights, where $0 \leq w_j \leq 1$ for $J = 2, \dots, J + 1$ and $w_2 + \dots + w_{J+1} = 1$.

After W^* is estimated, we are able to calculate the treatment effect in the conflict period $t > T_0$ from the equation $Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}$.

Synthetic Control Approach

- Pattani, Yala, Narathiwat, and Songkhla provinces as the "*deep south conflict*" provinces in the "treatment" group
- The rest of the 69 provinces in Thailand belongs to the “donor pool”, the group of potential comparison units
- Pre- conflict period : 1989 – 2003
Conflict period : 2004 – 2019
- The synthetic control method builds comparison provinces for Pattani, Yala, Narathiwat, and Songkhla from a combination of other provinces in the donor pool.
- Those comparison provinces were similar to treatment provinces in the pre-conflict period in various economic dimensions that has potential to be unemployment determinants.
- GPP per capita, agricultural proportion of the GPP, GPP deflator, minimum wage, and population

Synthetic Control Approach

Results

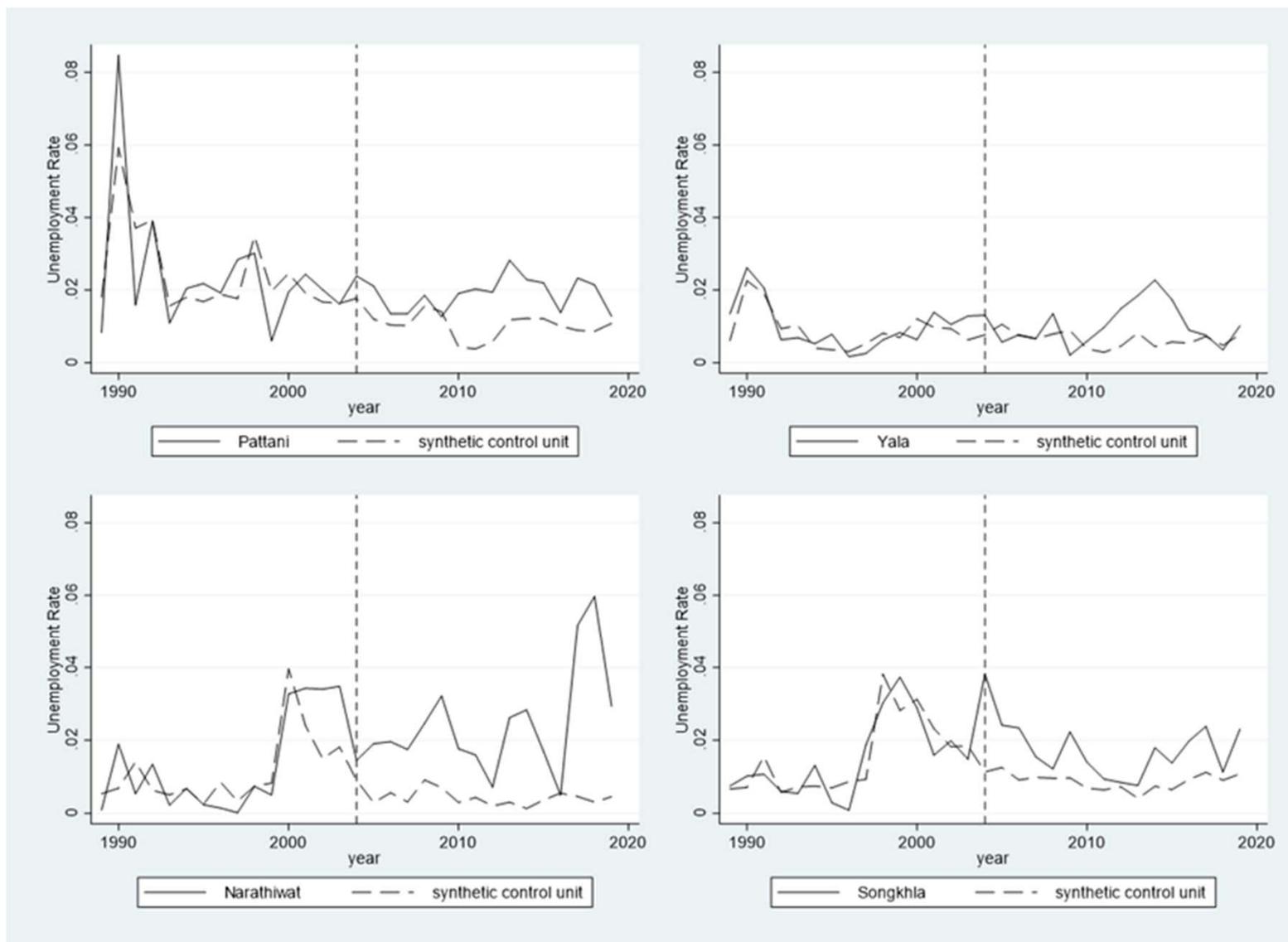
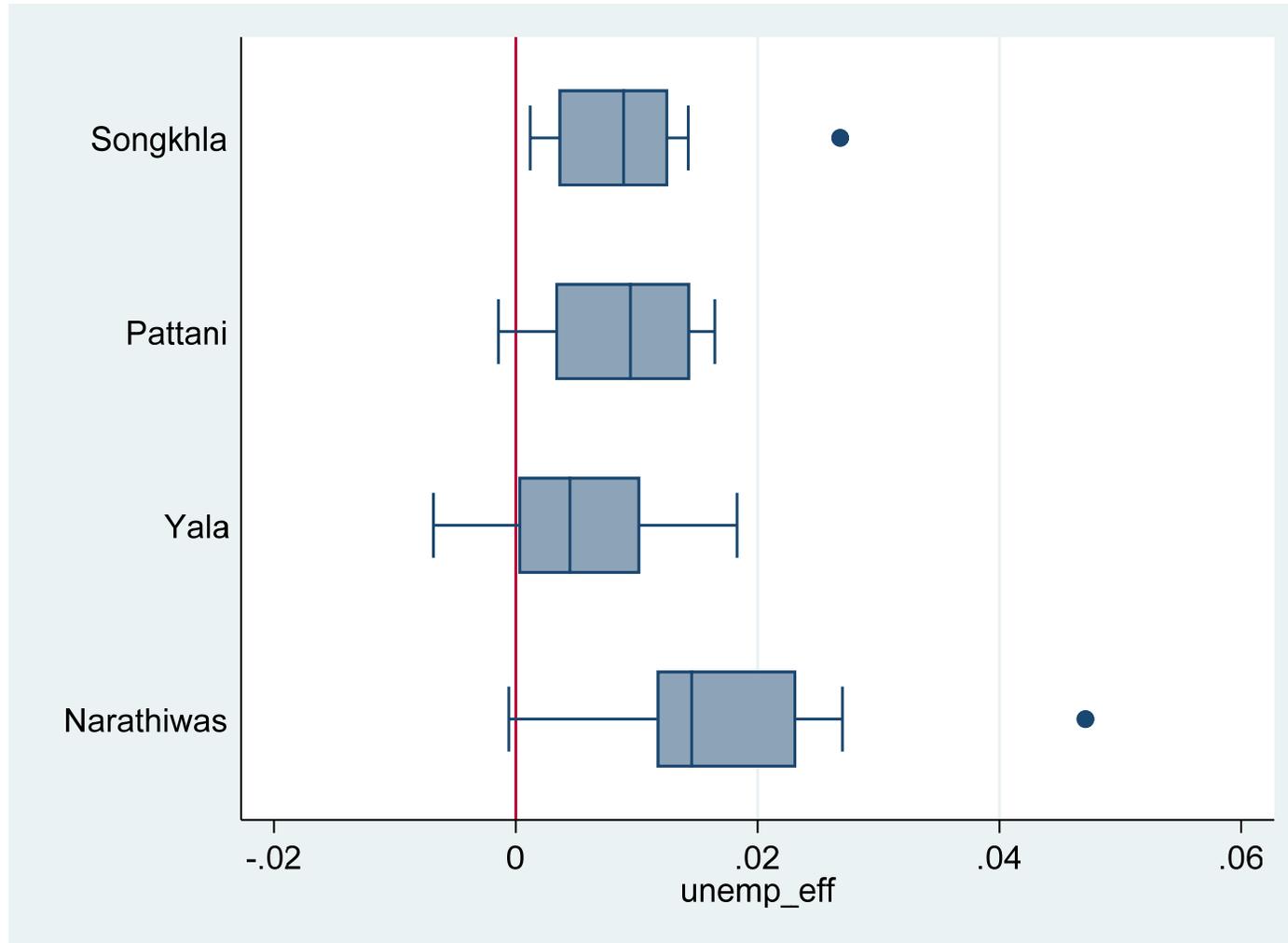


Figure 8. The difference between the reported (solid lines) and counterfactual unemployment rates (dashed lines) in Pattani, Yala, Narathiwat, and Songkhla.

Synthetic Control Approach

Results



The median of the difference between the reported unemployment rates and the counterfactual unemployment rates in Pattani, Yala, Narathiwat, and Songkhla are 0.95, 0.30, 1.51, and 0.89 percentage points, respectively.

Synthetic Control Approach

Results

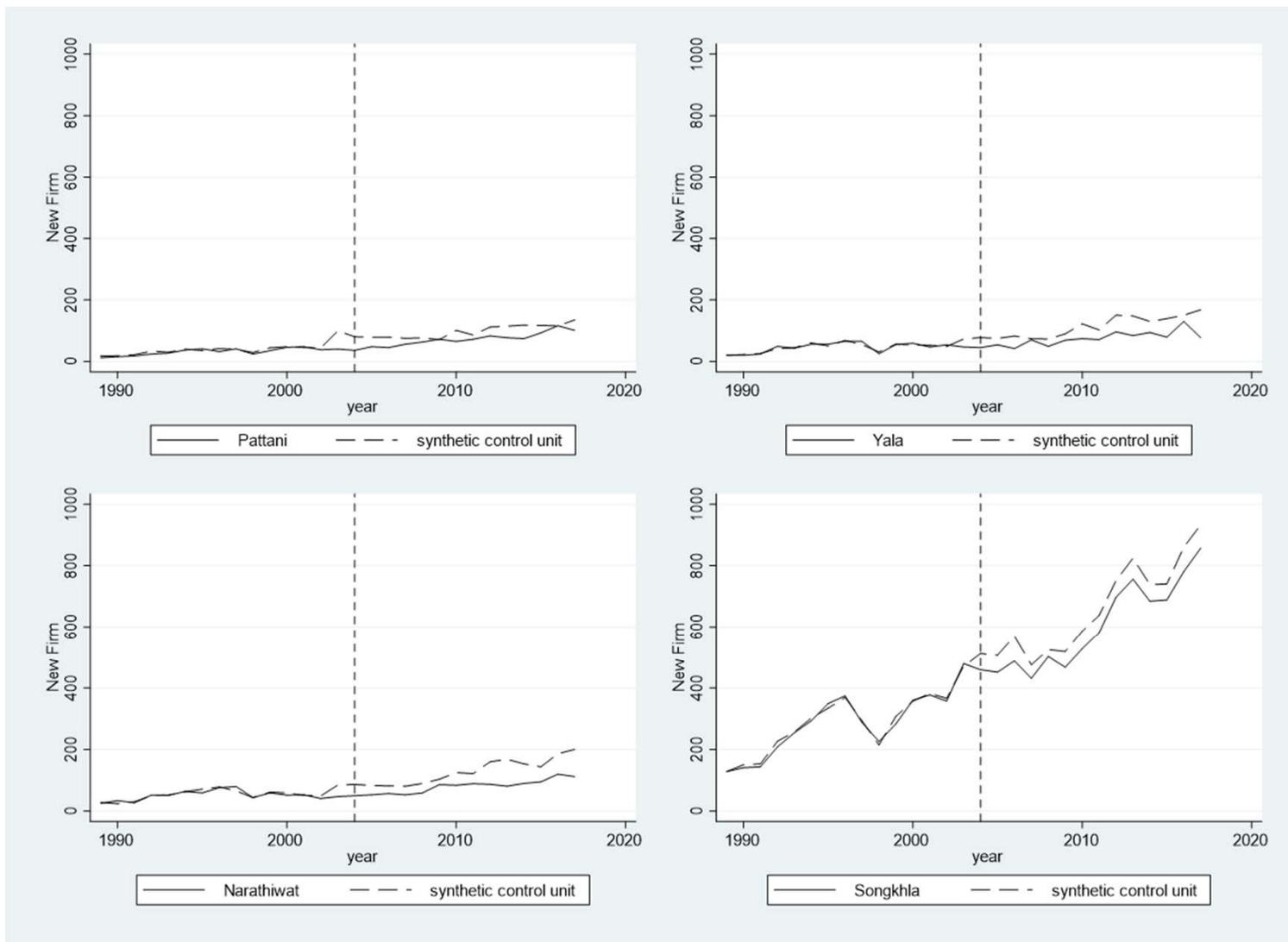
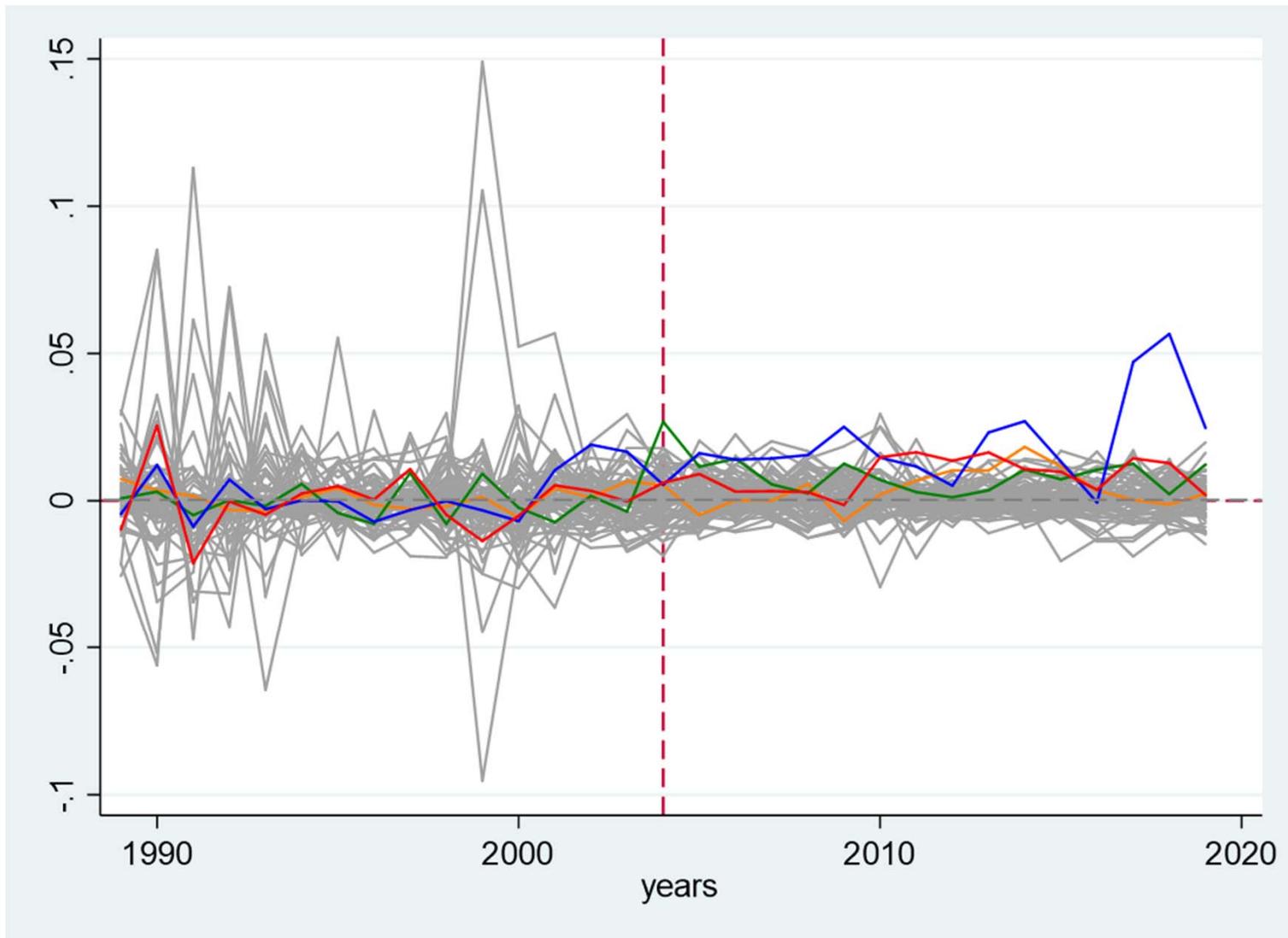


Figure 9. The difference between the reported (solid lines) and counterfactual new establishments (dashed lines) in Pattani, Yala, Narathiwat, and Songkhla.

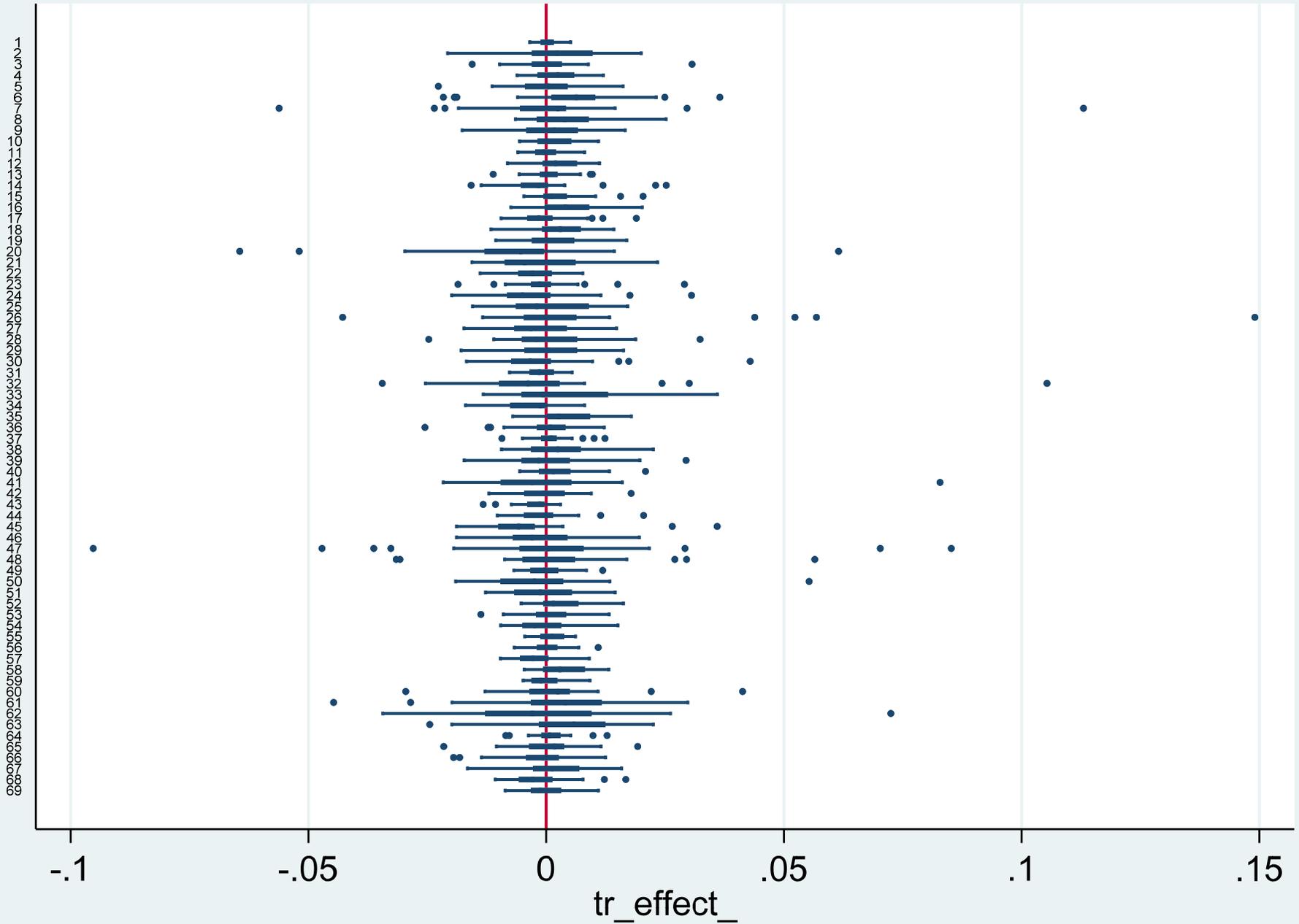
Synthetic Control Approach

Results



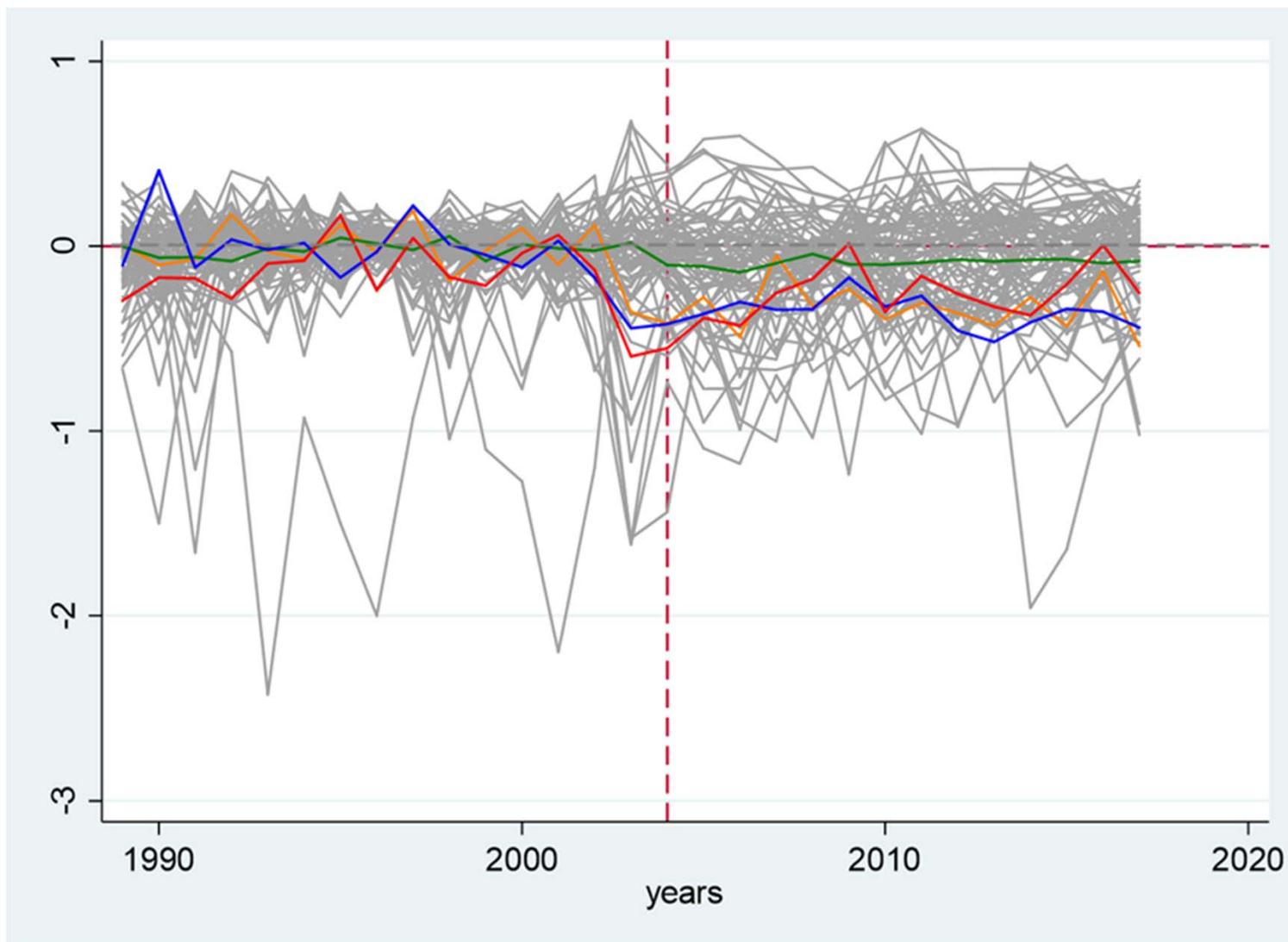
Note: The red, orange, blue, and green lines show the differences in Pattani, Yala, Narathiwat, and Songkhla, respectively.

Figure 10. **Placebo study** of the effect of **unemployment**



Synthetic Control Approach

Results



Note: The red, orange, blue, and green lines show the differences in Pattani, Yala, Narathiwat, and Songkhla, respectively.

Figure 11. Placebo study of the effect of [new establishments](#).

Synthetic Control Approach

Correlation between the effect from synthetic control method and the number of incidences of conflict, government expenditure, and the proportion of defense budget

$$Y_{it} = \beta_1 \text{event}_{it} + \beta_2 \text{govexp}_{it} + \beta_3 \text{share}_{it} + \gamma_i + \delta_t + u_{it} \quad \text{_____ (1)}$$

VARIABLES	(1) Effect on unemployment rate
event	0.000482** (9.07e-05)
govexp	-9.13e-13 (4.37e-13)
share	0.0219*** (0.00362)
Constant	0.0117 (0.00645)
Province FE	YES
Year FE	YES
Observations	56
Number of province	4
R-squared	0.379

VARIABLES	(1) Effect on new establishments
L.event	-0.00315** (0.000856)
L.govexp	7.10e-12 (1.41e-11)
L.share	-0.144* (0.0478)
Constant	-0.293*** (0.0485)
Province FE	YES
Year FE	YES
Observations	52
Number of proid	4
R-squared	0.479

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Panel VAR

- **Conflict caused** the unemployment rate (under the social security system)
- The **unemployment rate did not** reversely cause further conflict

Synthetic Control

- **Unemployment rate** in the deep south provinces were higher than they should be
- The number of **new establishments** were lower than they should be
- The **number of incidences** were positively correlated with unemployment
- **Government expenditure** was negatively correlated with unemployment, but statistically insignificant
- **Share of the defense budget** was positively correlated with unemployment

Policy Implication



- Conflict caused economic instability. The government should issue **unemployment relief packages** in the conflict area and provide **incentives for new establishments** in the conflict area
- Government should keep the **defense budget under control** so that public expenditure or investment is allocated to **economic boosting policies** such as research and development