Labor Market Effects of Credit Constraints: Evidence from a Natural Experiment*

Anil Kumar
Federal Reserve Bank of Dallas

Che-Yuan Liang
Uppsala University

Motivation

- Credit constraints pose major challenges to economic growth
- Large body of research on its effect on consumer spending
    - Most assume labor supply fixed
- Very few recent papers on the impact of credit constraints on labor supply
    - Rossi and Trucchi (2016), Bui and Ume (2016)
- No formal investigation of labor market effects specifically of home equity borrowing constraints
- Multiple studies used constitutional amendments in Texas relaxing home equity borrowing constraints as natural experiment
    - Consumer spending (Abdallah and Lastrapes, 2012)
    - College Access (Stolper, 2015)
    - House Prices (Zevelev, 2018)

Contributions

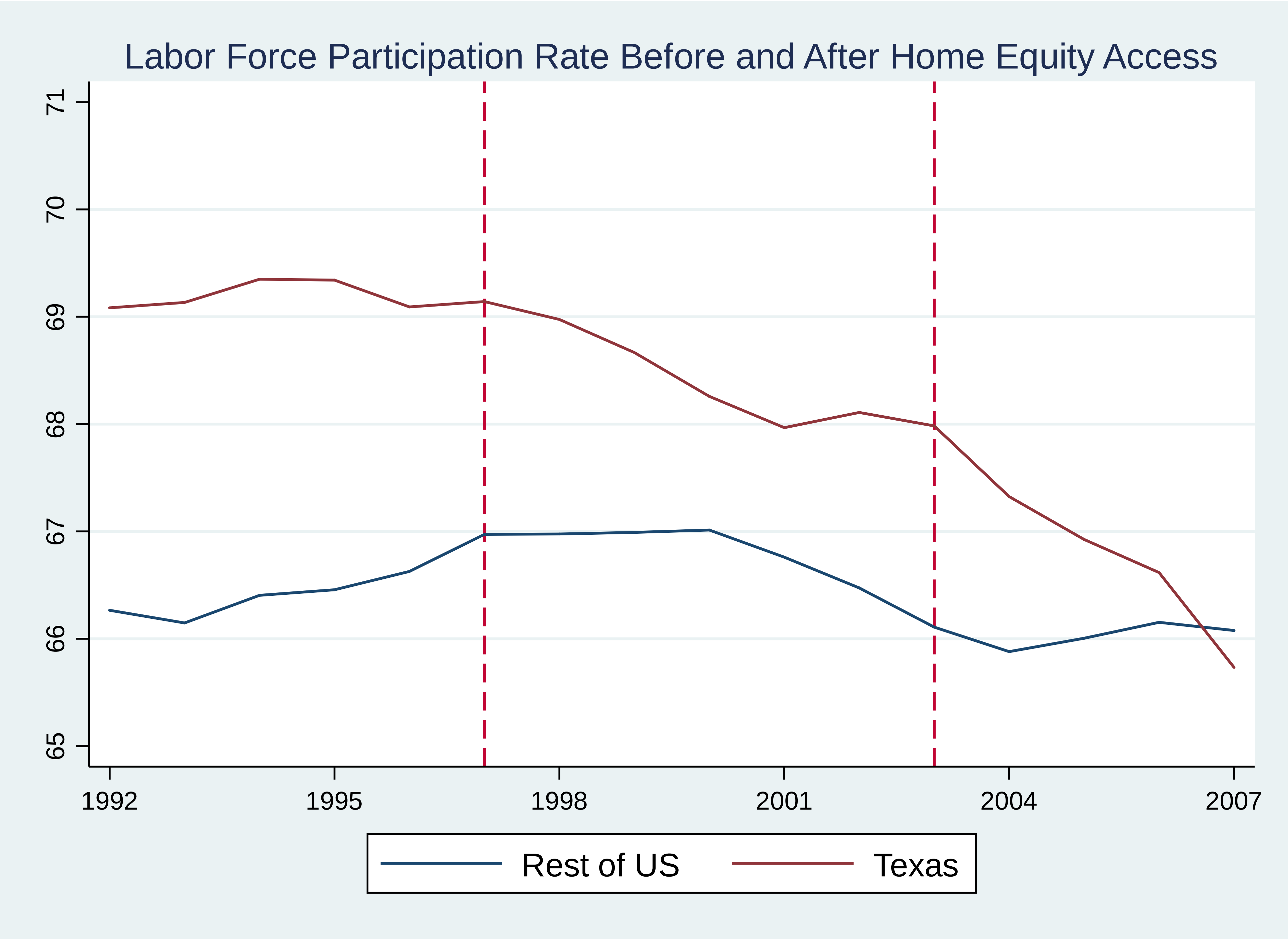
- Estimate labor market effects of easier access to home equity borrowing using a natural experiment
  - 1997 constitutional amendment in Texas allowing HE Loans
  - 2003 amendment allowing HELOC
- First to estimate the labor market effects of such a large and plausibly exogenous shock to home equity borrowing constraints
- Extend the basic two-period theoretical model of Rossi and Trucchi (2016) to a three-period setting with collateral constraints and derive new implications for labor supply
- Using SCM based on machine-learning, examine the effect of easier credit access on overall economic activity—GDP growth

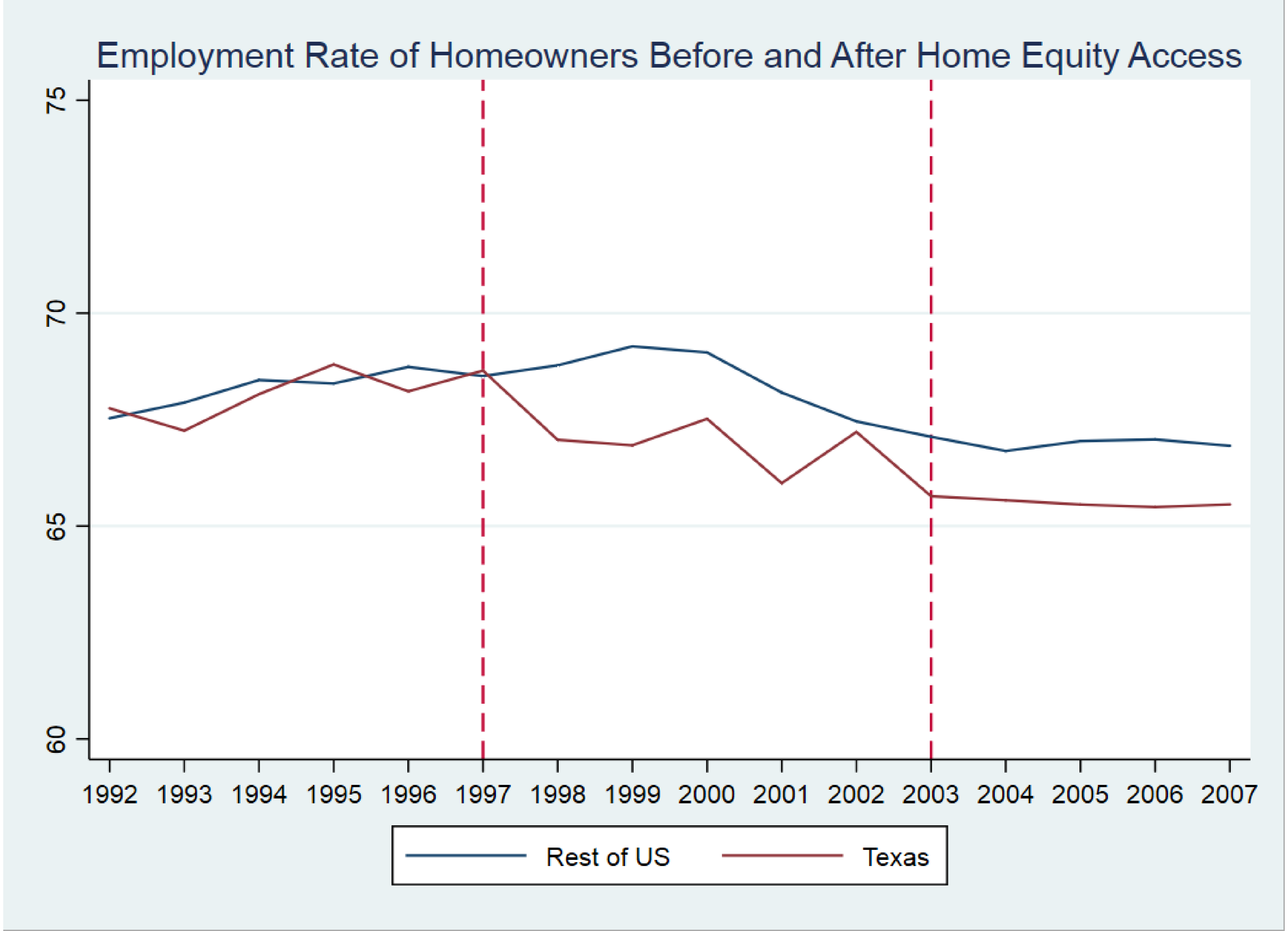
Texas 1997 Home Equity Amendment

- Before 1998, the Texas constitution greatly restricted collateralized borrowing against home equity
- Home could be used as collateral primarily for:
  - Home purchase
  - Home improvements
  - Taxes
- Cash-out refinancing not permitted
- Home equity loans through second mortgages or HELOC off limits

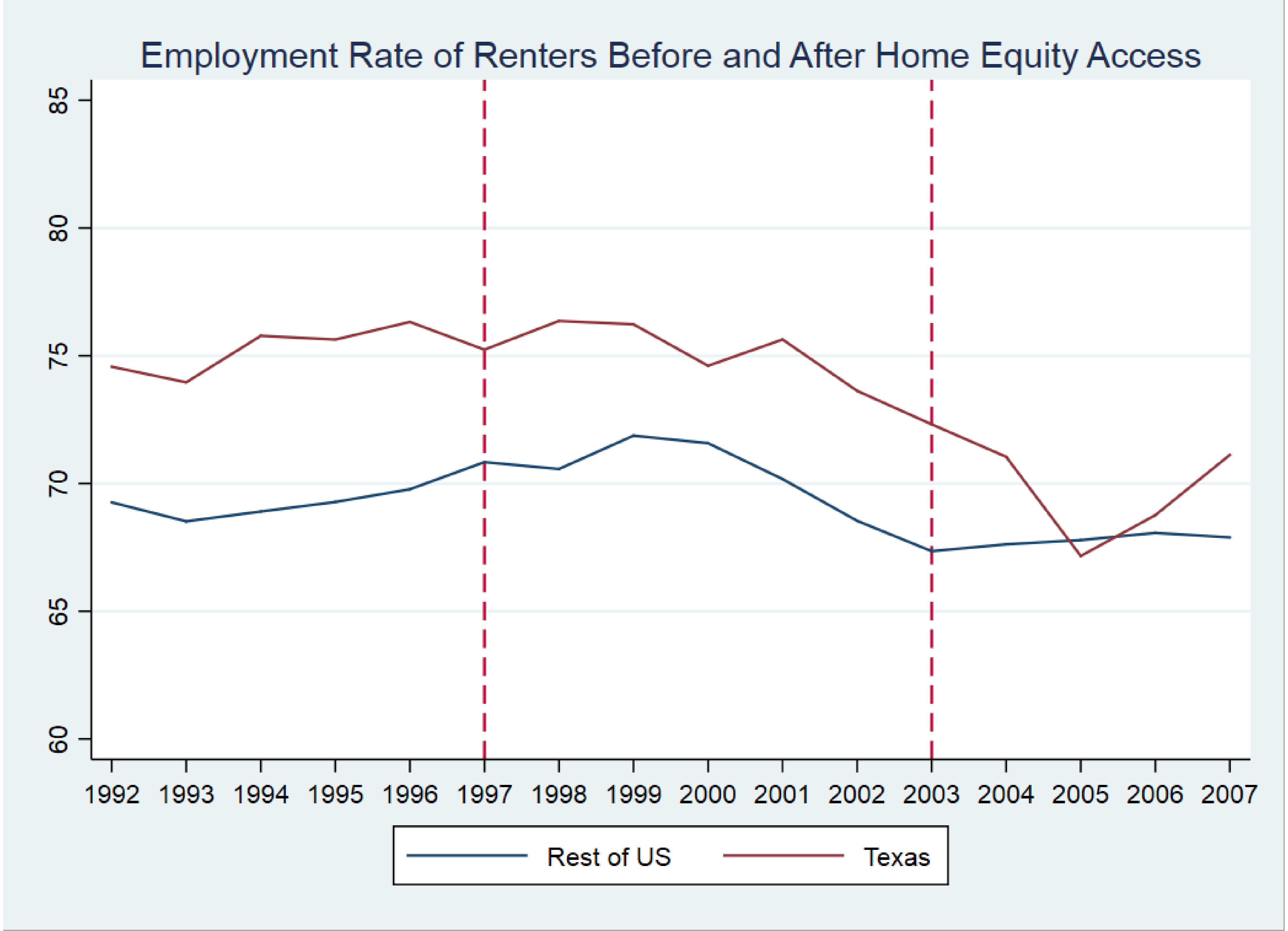
Texas 1997 Home Equity Amendment

- House Joint Resolution 31 (HJR 31) in November 1997
  - Allowed home equity loans through second mortgages or cash-out refinancing
  - Capped borrowed amount to no more than 80 percent of home's appraised value
  - Prohibited HELOCS
- 2003 constitutional amendment authorized HELOCs
  - Subject to no more than 80 percent CLTV

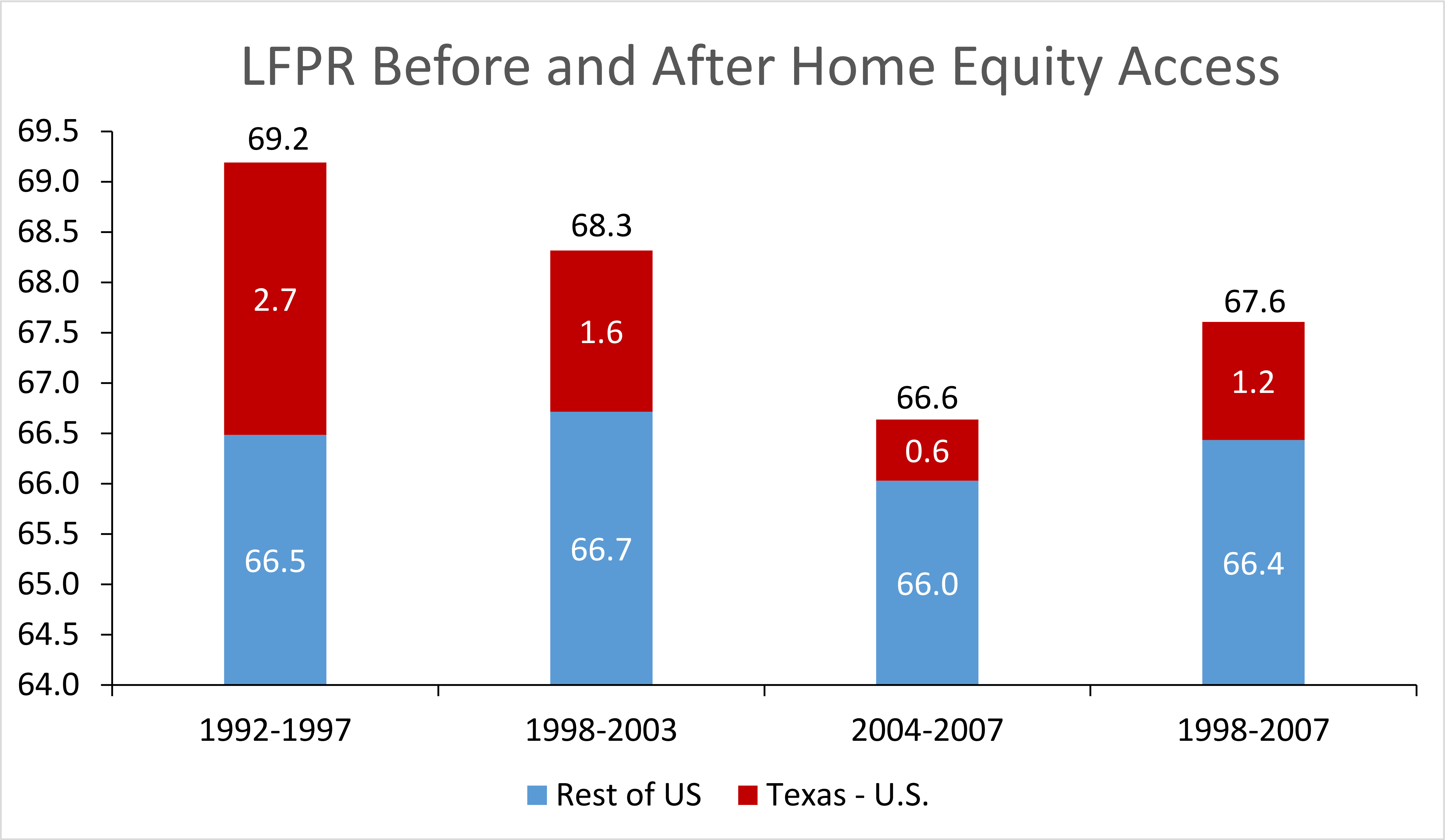

Labor Force Participation Rate Before and After Home Equity Access
71
70
69
68
67
66
65
1992
1995
1998
2001
2004
2007
Rest of US
Texas



Employment Rate of Homeowners Before and After Home Equity Access
75
70
65
60
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Rest of US
Texas



Employment Rate of Renters Before and After Home Equity Access
85
80
75
70
65
60
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Rest of US
Texas



LFPR Before and After Home Equity Access
69.5
69.0
68.5
68.0
67.5
67.0
66.5
66.0
65.5
65.0
64.5
64.0
69.2
2.7
66.5
68.3
1.6
66.7
66.6
0.6
66.0
67.6
1.2
66.4
1992-1997
1998-2003
2004-2007
1998-2007
Rest of US
Texas - U.S.

Key Findings

- Easier access to home equity led to 1.3 percentage point average decline in LFPR over 10 years after HELOCs
  - 1998-2003 (before HELOC): About 1 percentage point
  - 2004-2007 (after HELOC): 2 percentage points
- Access to HELOC in 2004 had a substantially larger effect than HE Loans
- Easier credit access led to relatively larger declines in LFPR of females, prime-age population, and the college-educated
- Analysis of March CPS shows significant decline in the LFPR of homeowners, but little discernible effect on renters
- Muted effect on GDP growth

Previous Literature

- Rossi and Trucchi (2016: Liquidity constrained males (those with current income below their permanent income) worked less hours
  - Lacked an exogenous shock, so used IV
- Bui and Ume (2016): Using the staggered passage of branch banking deregulation laws across U.S. states found that weekly hours declined by 0.5.
- Worswick (1999): Credit-constrained immigrant wives worked longer hours to support family consumption
- Impact of mortgage debt commitments
  - <u>Positive effects</u>: Fortin (1995), Aldershof et al. (1997), Del Boca and Lusardi (2003), Bottazzi (2004), Butricia and Karamcheva (2013), Lusardi and Mitchell (2017), Maroto (2011), Houdre (2009), Cao (2017)
  - <u>Negative effects</u>: Pizzinelli (2017), Bernstein (2015)
- No paper studied the labor market effects of home equity borrowing constraints

Theoretical Framework

- Extend the standard two-period life-cycle model of Rossi and Trucchi (2016) to a three-period set-up
  - Can also be seen as introducing endogenous labor supply in Hurst and Stafford (2004) and Bhutta and Keys (2016)
- Agents choose consumption (c_t) in the three periods ($t = 1,2,3$), leisure (l_t), and home equity extraction (E_t) in the first two periods to maximize a three-period intertemporally separable utility function with δ the discount factor:

$$U = u(c_1, l_1) + \delta u(c_2, l_2) + \delta^2 U(c_3, 1)$$

- Subject to the budget constraints:

$$c_1 = w(1 - l_1) + E_1 - r\pi H_0 - A_1$$
$$c_2 = A_1(1 + r) + w(1 - l_2) + E_2 - (1 + r)E_1 - r\pi H_0 - A_2$$
$$c_3 = P + A_2(1 + r) + [(1 + r_H)^3 H_0 - (1 + r)\pi H_0] - E_2(1 + r)$$

- And the collateral constraints:

$$E_1 \leq a(1 + r_H)H_0 - \pi H_0$$
$$E_2 \leq a(1 + r_H)^2 H_0 - \pi H_0$$

Theoretical Framework

- First Order Conditions (FOCs) yield:

$$u_{c_1} = (1+r)\delta u_{c_2} + \mu_4 = u_{l_1}/w = (1+r)\delta u_{l_2}/w + \mu_4 \qquad (1)$$

$$\delta u_{c_2} = \delta u_{l_2}/w = (1+r)\delta^2 u_{c_3} + \mu_5 \qquad (2)$$

- Let l_t^C denote leisure if collateral constraints bind ($\mu_4 > 0, \mu_5 > 0$)
  - l_t^{NC}: when they do not bind ($\mu_4 = 0, \mu_5 = 0$)
- FOCs imply:
  - $u_{l_1}^C > u_{l_1}^{NC}$ and, therefore, $l_1^C < l_1^{NC}$
- <u>Key Takeaways</u>
- When the collateral constraint binds, leisure is lower and labor supply higher.
- No clear relationship between the constraints and labor supply in period 2
  - (1) suggests that $l_2^C > l_2^{NC}$, (2) implies that $l_2^C < l_2^{NC}$.

Theoretical Framework

- For households facing binding collateral constraints, with intertemporally separable log utility function that is also separable in consumption and leisure:

$$l_1^* = \frac{w + a(1 + r_H)H_0 - (1 + r)\pi H_0 - A_1}{2w}$$

$$l_2^* = \frac{w + a(r_H - r)(1 + r_H)H_0 + (1 + r)A_1 - A_2}{2w}$$

- l_1^* varies positively with ease of credit access, a, if home value, $(1 + r_H)H_0$, is positive
- the relationship between a and l_2^* remains ambiguous, as it depends on the sign of $(r_H - r)$

Data

- State-level data from 1992-2007 on 50 states
- Outcome variable: Labor Force Participation Rate (LFPR)
- State-level data sources:
  - LFPR: BLS/LAUS
  - Wages: Average hourly earnings of manufacturing workers (BLS)
  - State income tax rate: state income tax receipts/personal income (BEA)
  - House prices: Federal Housing Finance Agency (FHFA)
  - Demographics: State-level annual averages of basic monthly CPS
- March supplements of the IPUMS-CPS from 1992 to 2007
  - Homeowners vs. Renters

Econometric Specification

- Conventional Difference-in-Differences Specifications:

$$Y_{st} = \beta^{HEL} D_s^{TX} \times D_t^{Post-HEL} + \beta^{HELOC} D_s^{TX} \times D_t^{Post-HELOC} + \boldsymbol{X}_{st}\gamma + \delta_t + \alpha_s + \eta_{st}$$

- Dynamic effects:

$$Y_{st} = \sum_{t<1997} \beta_t\, D_s^{TX} \times D_t + \sum_{t>1997} \beta_t\, D_s^{TX} \times D_t + \boldsymbol{X}_{st}\gamma + \delta_t + \alpha_s + \eta_{st}$$

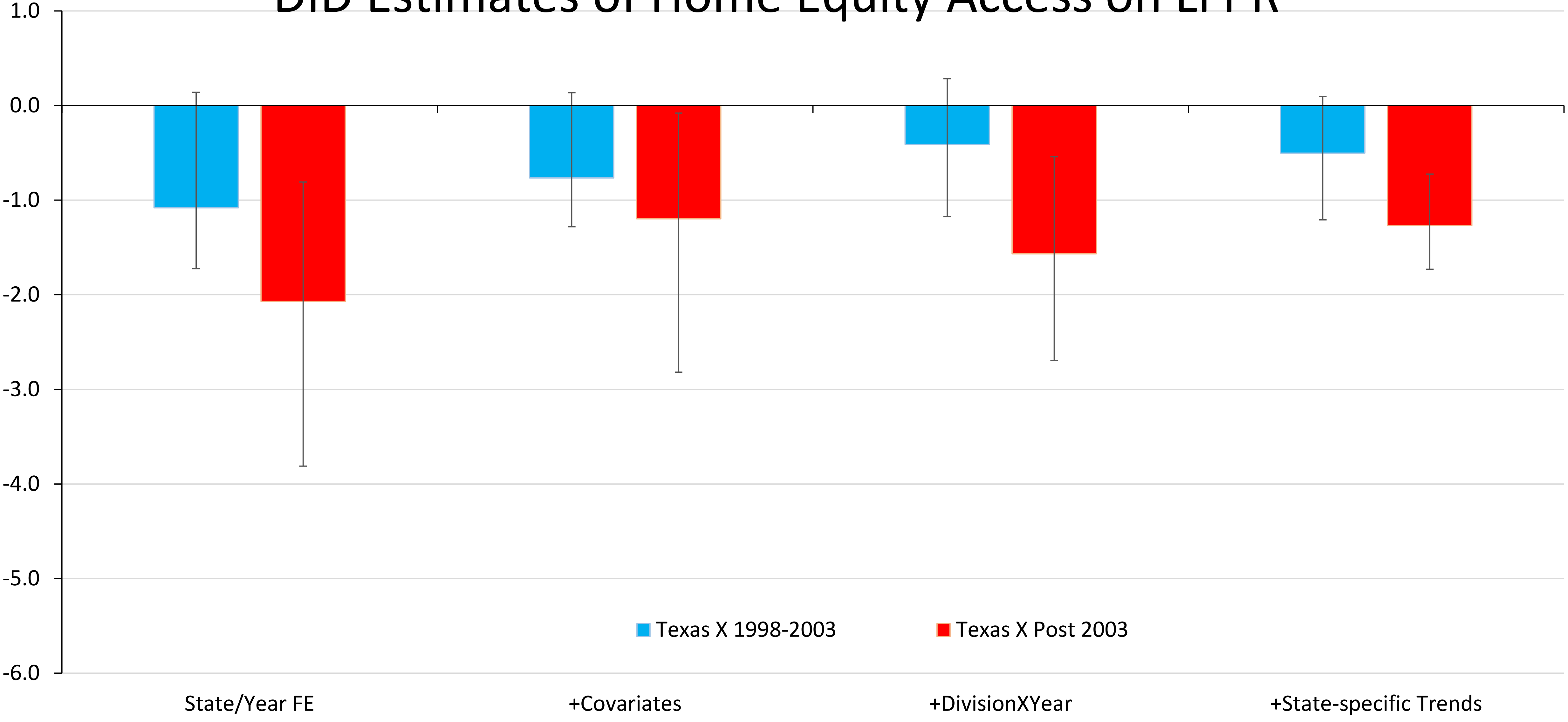
- Synthetic Control Method:

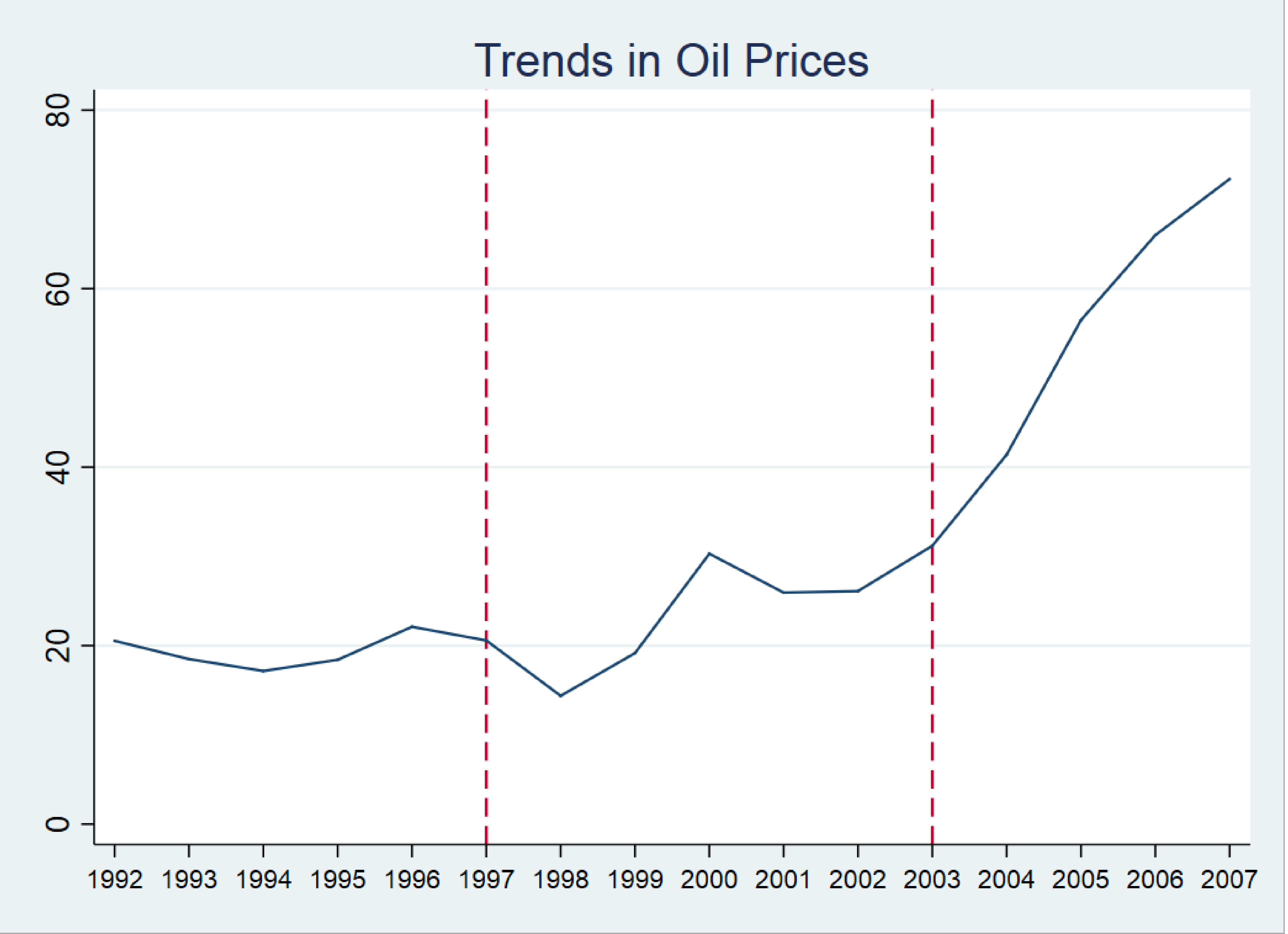
Counterfactual: $Y_{st}^N = \boldsymbol{X}_{st}\gamma_t + \delta_t + \mu_t \alpha_s + \eta_{st}$

Treatment Effect: $\hat{\beta}_{TX_t} = Y_{TXt} - \hat{Y}_{TXt}^N = Y_{TXt} - \sum_{s \neq TX} w_s\, Y_{st}, \quad t > 1997$

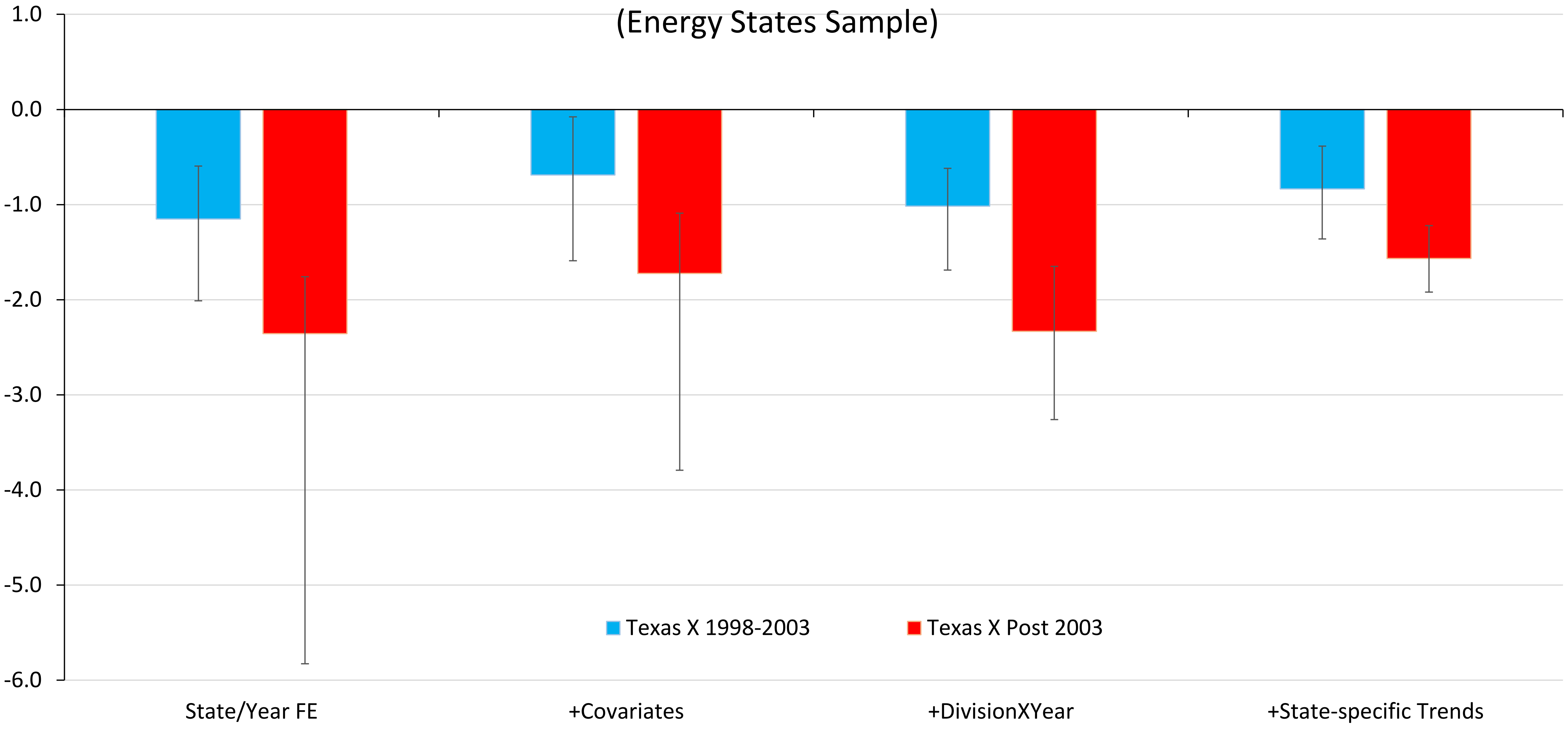
Difference-in-Differences (DID) Estimates

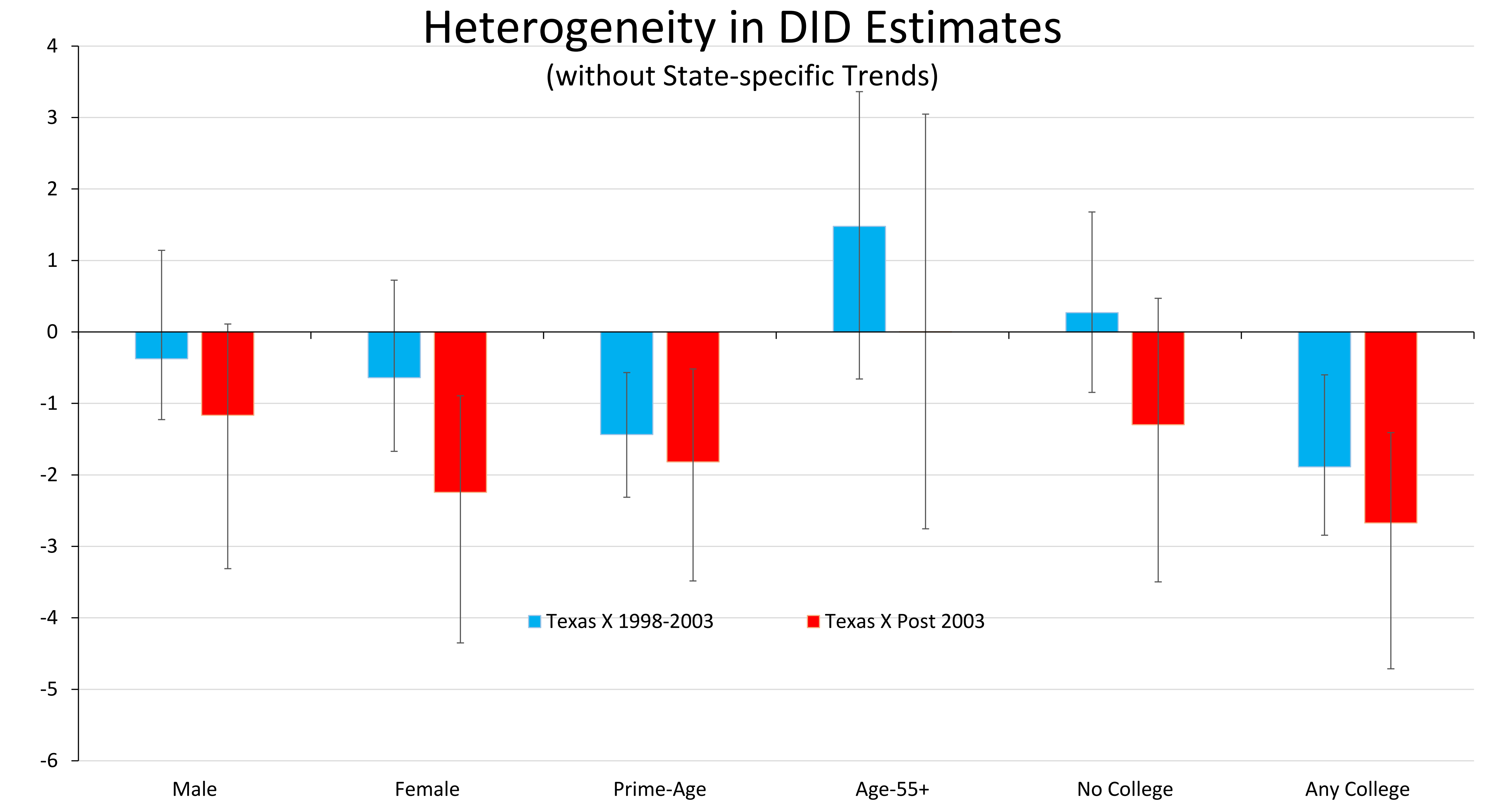
DID Estimates of Home Equity Access on LFPR



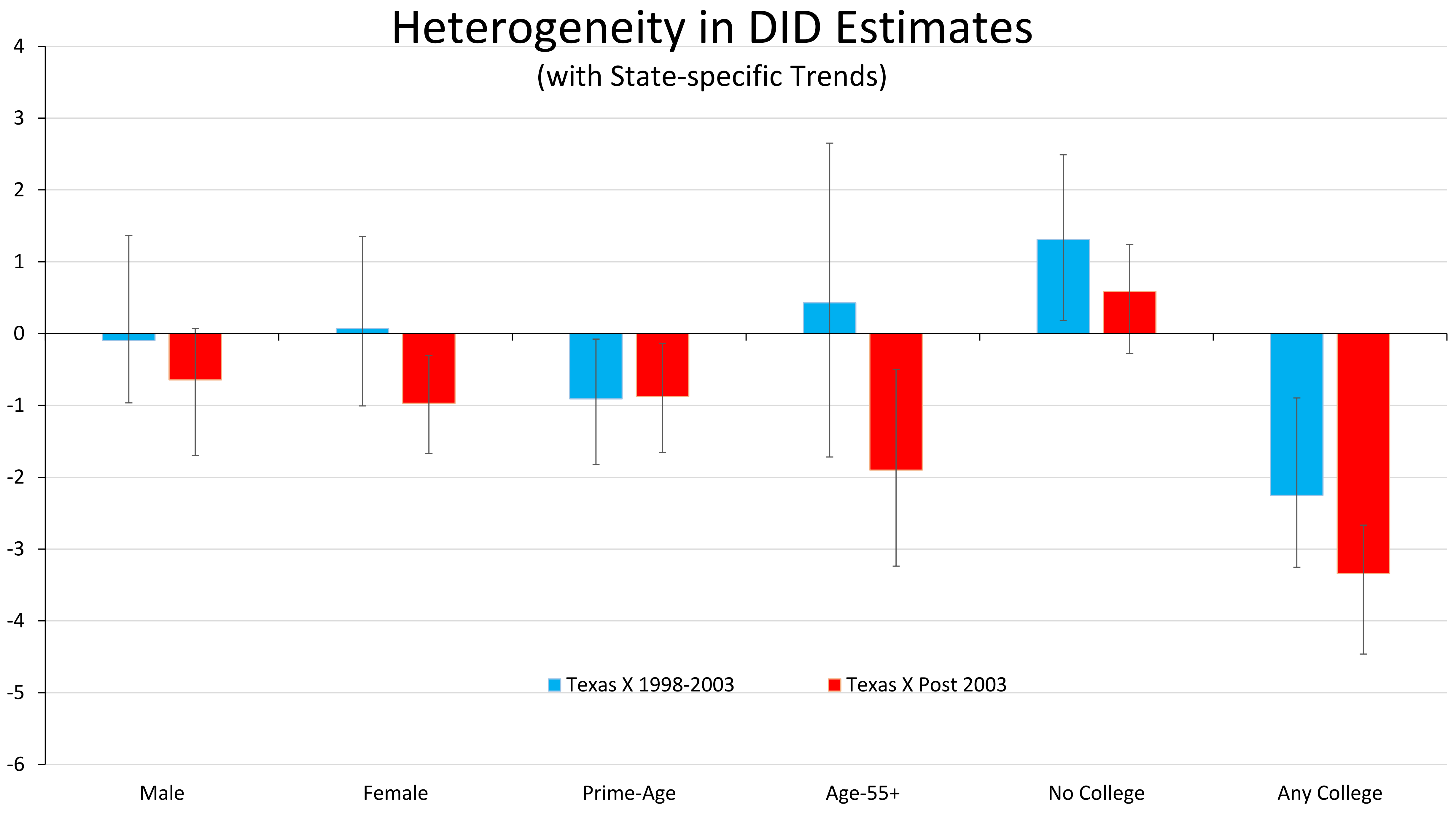

Trends in Oil Prices
0
20
40
60
80
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007

DID Estimates of Home Equity Access on LFPR





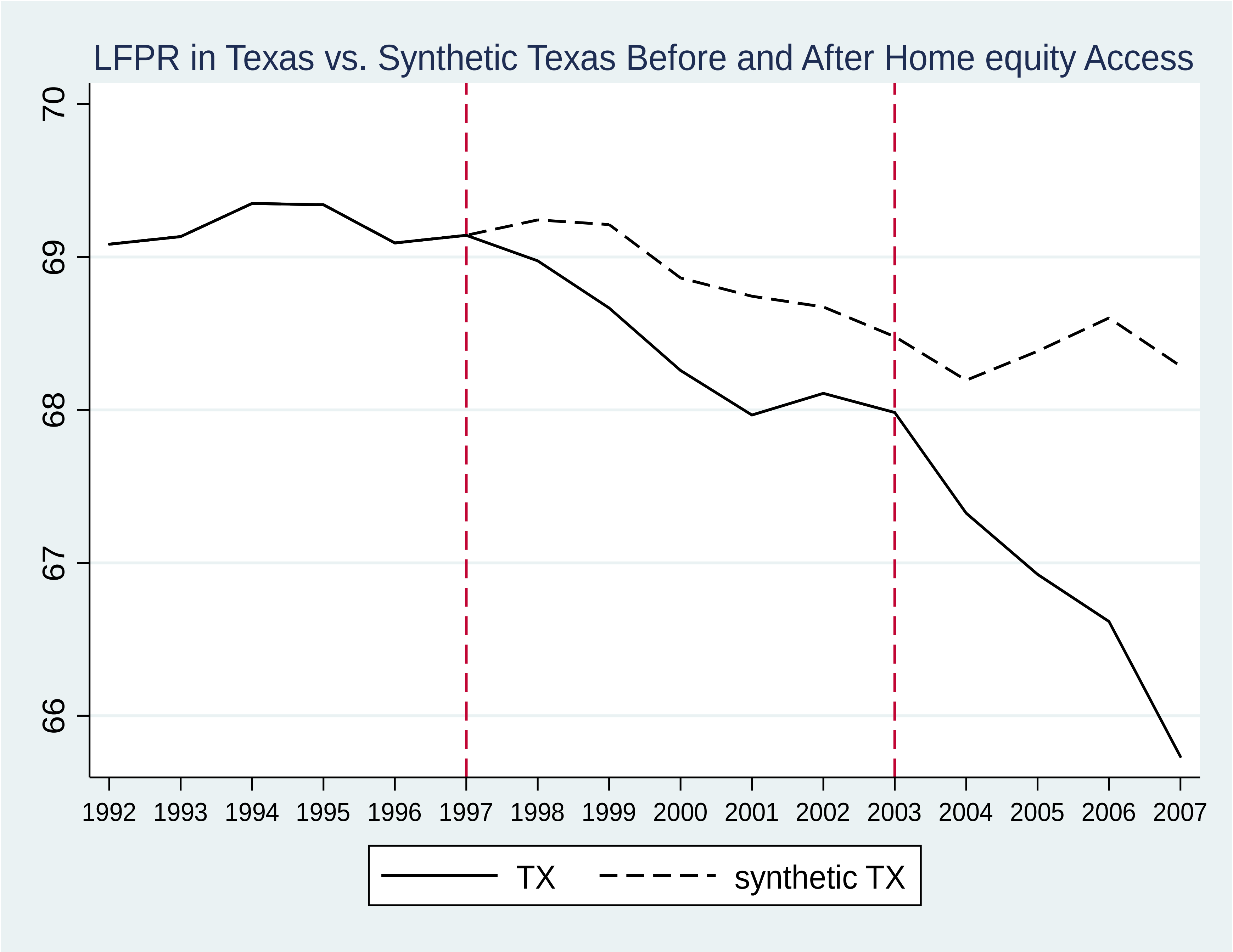
Heterogeneity in DID Estimates
(without State-specific Trends)
4
3
2
1
0
-1
-2
-3
-4
-5
-6
Texas X 1998-2003
Texas X Post 2003
Male
Female
Prime-Age
Age-55+
No College
Any College

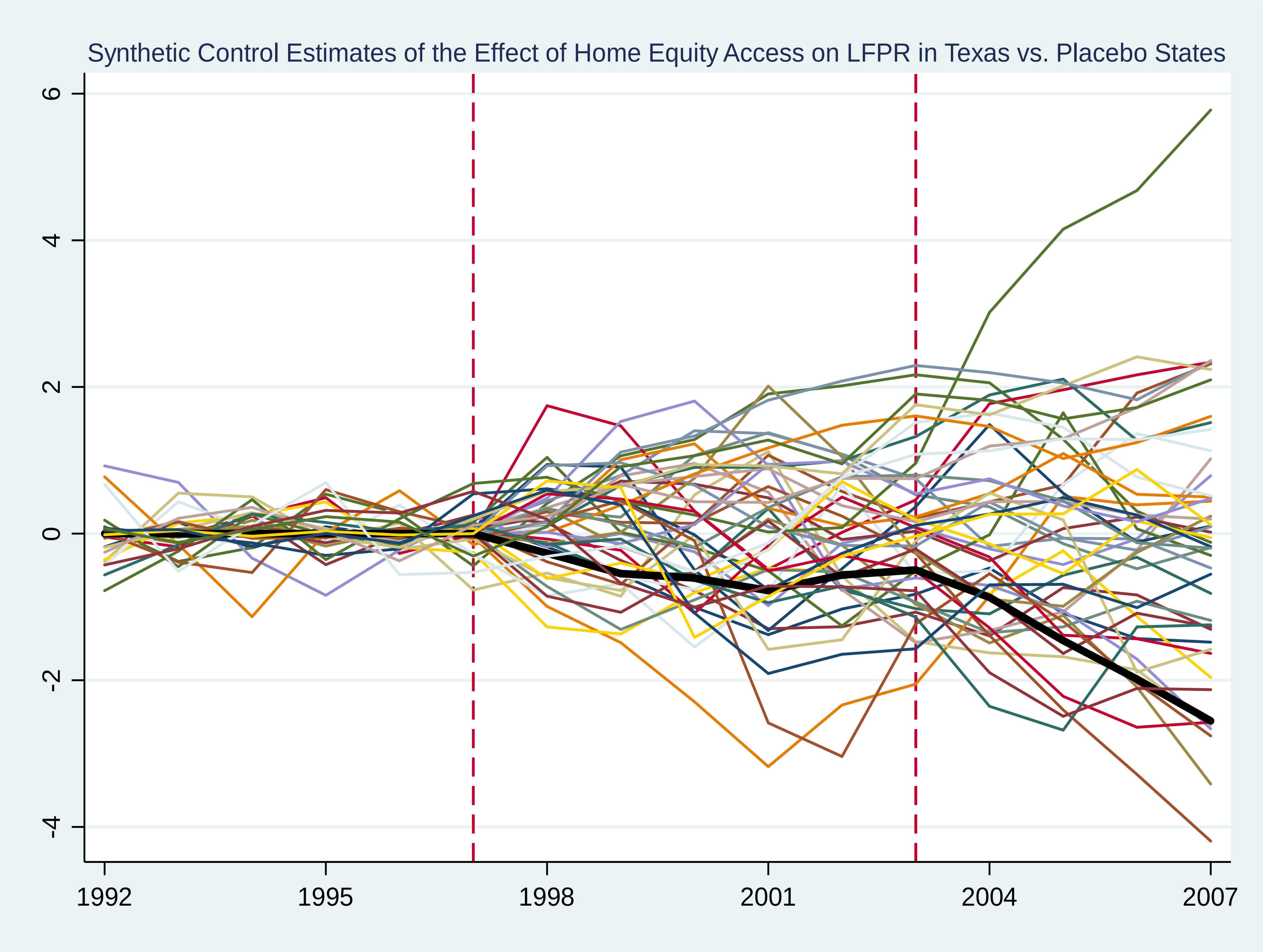

Heterogeneity in DID Estimates
(with State-specific Trends)
4
3
2
1
0
-1
-2
-3
-4
-5
-6
Texas X 1998-2003
Texas X Post 2003
Male
Female
Prime-Age
Age-55+
No College
Any College

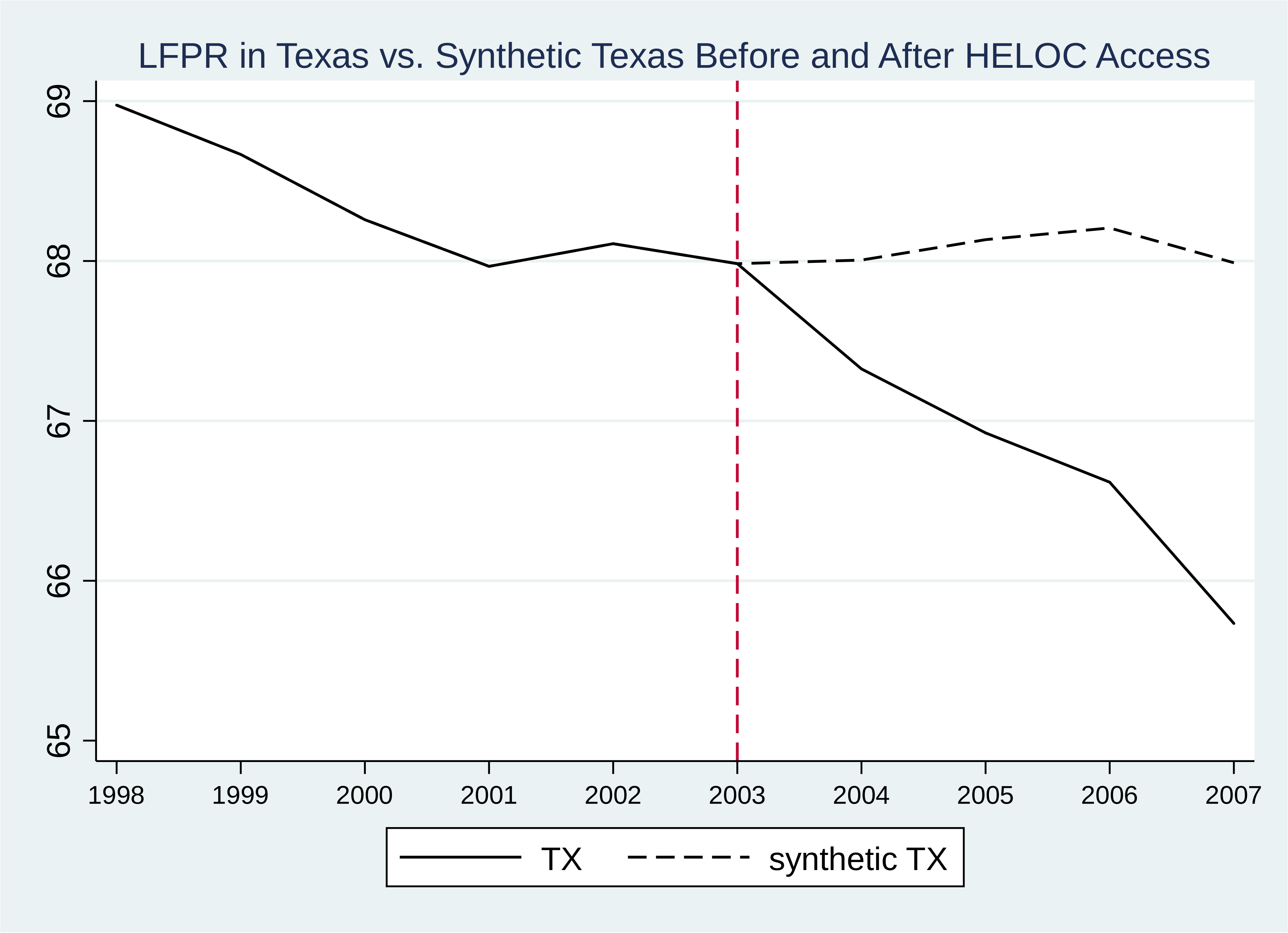
Summary of Results from DID Specifications

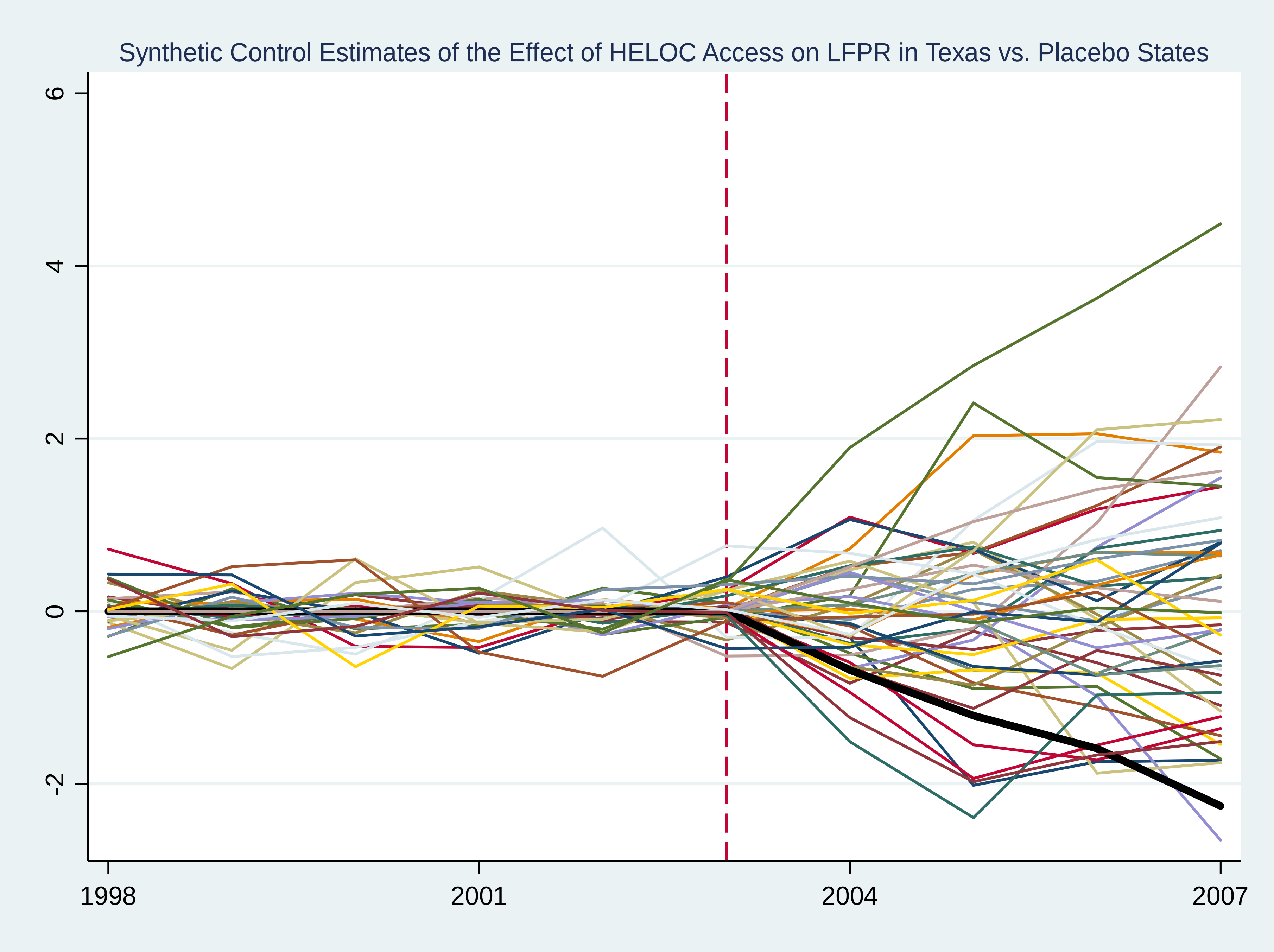
- HEL access in 1998 led to 0.5-1 percentage point per year decline in LFPR over 5 years
  - HEL effect attenuated over time
- Access to HELOCs in 2004 had a 50-100 percent larger negative effect than HEL access in 1998
- DID estimates sensitive to state-specific trends
  - Specifications with state-specific trends not particularly reliable if law change affected not only the level of LFPR, but also its growth
- Trends in oil prices likely not driving results, as DID estimates robust to restricting sample to energy states
- Need to go beyond DID estimates to appropriately account for differential trends

Synthetic Control Estimates:
Constrained Model with All Pre-Treatment Lags


LFPR in Texas vs. Synthetic Texas Before and After Home equity Access
70
69
68
67
66
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
TX
synthetic TX


Synthetic Control Estimates of the Effect of Home Equity Access on LFPR in Texas vs. Placebo States
6
4
2
0
-2
-4
1992
1995
1998
2001
2004
2007

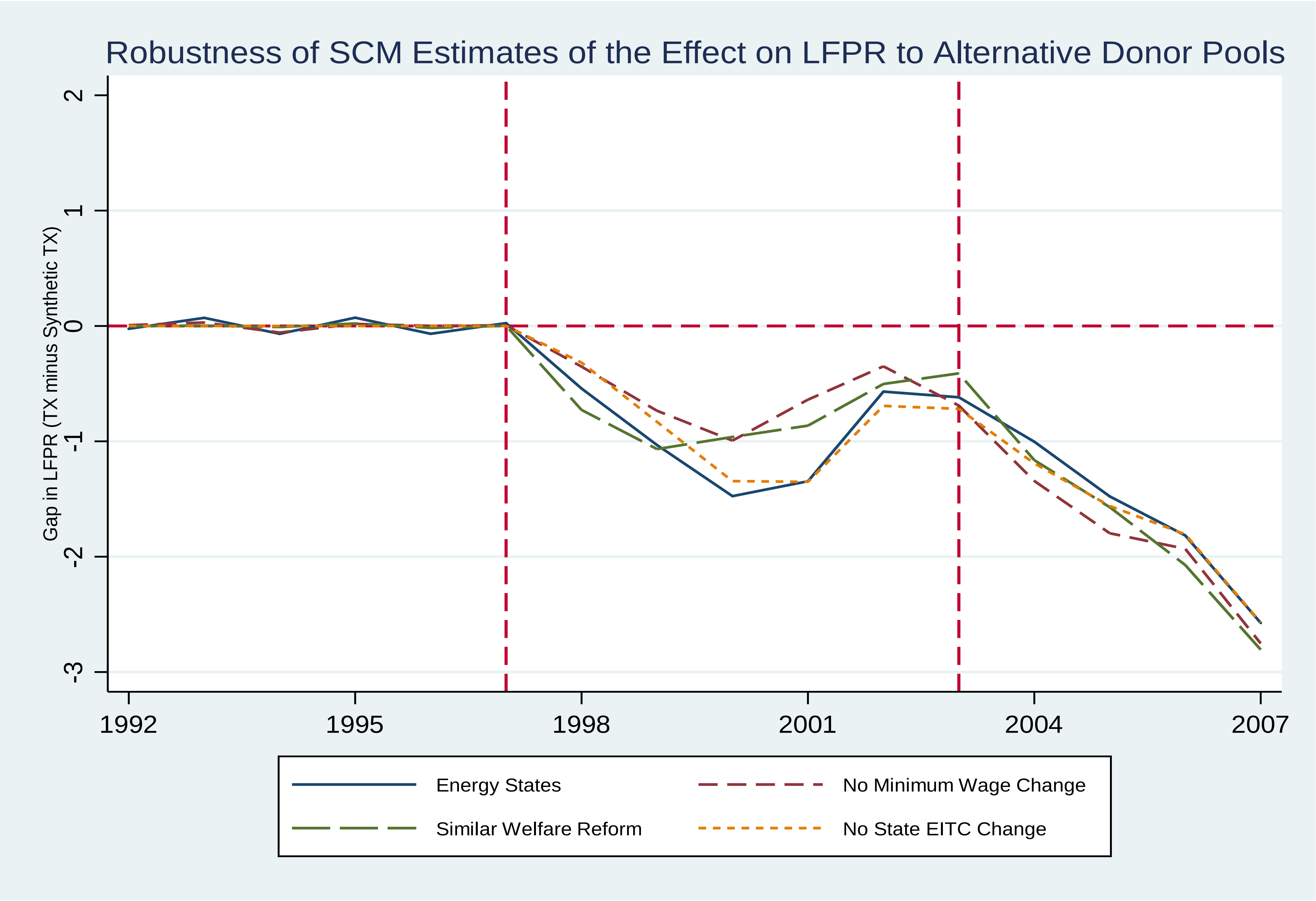

LFPR in Texas vs. Synthetic Texas Before and After HELOC Access
69
68
67
66
65
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
TX
synthetic TX


Synthetic Control Estimates of the Effect of HELOC Access on LFPR in Texas vs. Placebo States
6
4
2
0
-2
1998
2001
2004
2007

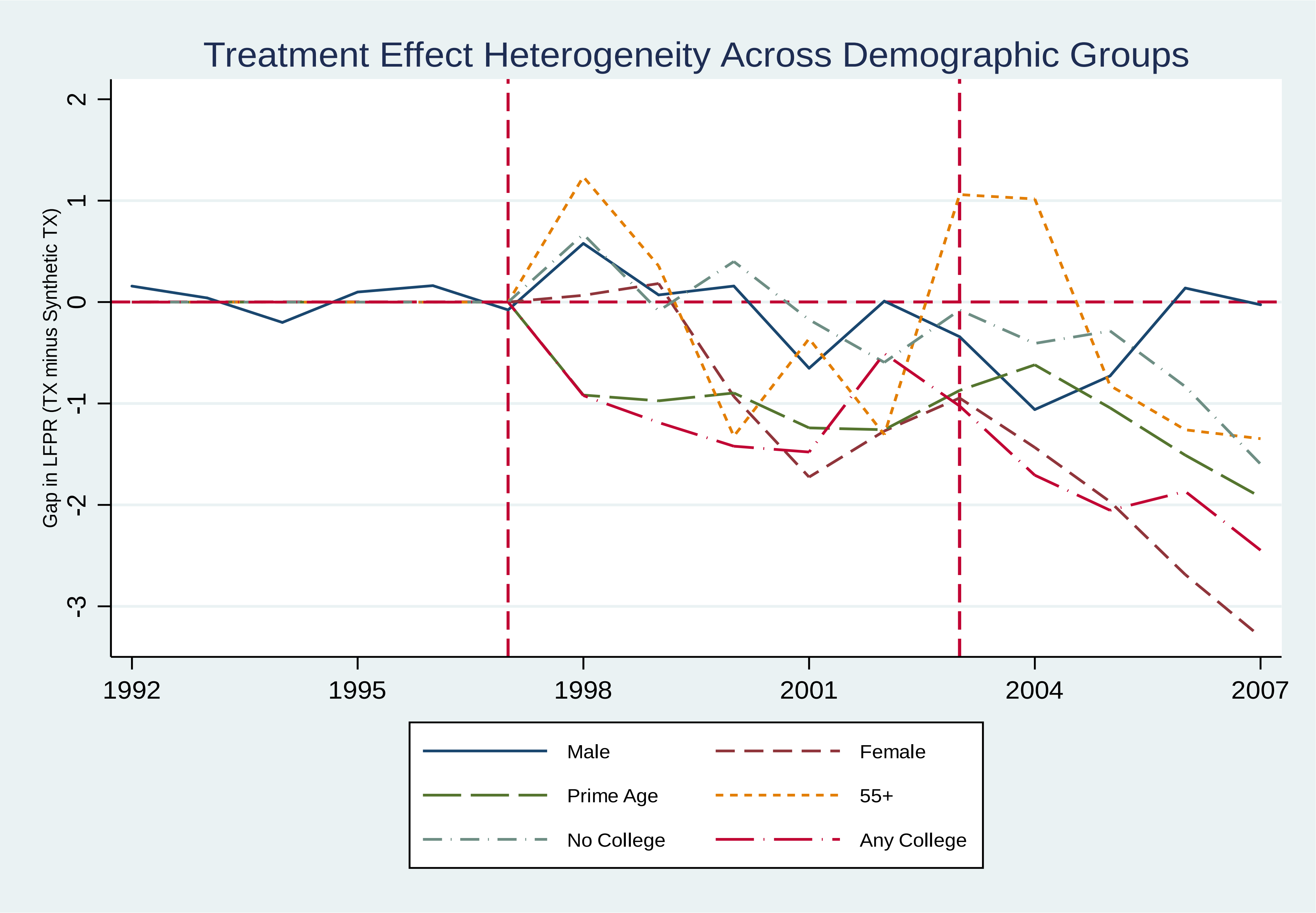
Synthetic Control Estimates: Robustness

Synthetic Control Estimates with Standardized P-Values

	Model with All Pre-Treatment Lags	Model with Covariates and Some Lags	Model with All Pre-Treatment Lags: Energy States	Model with All Pre-Treatment Lags: Homeowners	Model with All Pre-Treatment Lags: Renters
Treatment Effect	-1.012	-1.579	-1.245	-1.429	-0.219
Std. P-value	0	0.0408	0.0909	0.102	0.0204
Pre-Mean Effect	9.47e-13	-0.0675	0.00121	-3.25e-11	1.06e-11
Pre-Std. P-value	1	0.857	0.909	0.898	0.980
Pre-RMSPE: TX	1.96e-10	0.151	0.0586	1.03e-09	1.18e-10
Pre-RMSPE: Ctrls	0.309	0.498	1.152	0.590	0.979



Robustness of SCM Estimates of the Effect on LFPR to Alternative Donor Pools
Gap in LFPR (TX minus Synthetic TX)
2
1
0
-1
-2
-3
1992
1995
1998
2001
2004
2007
Energy States
No Minimum Wage Change
Similar Welfare Reform
No State EITC Change



Treatment Effect Heterogeneity Across Demographic Groups
Gap in LFPR (TX minus Synthetic TX)
2
1
0
-1
-2
-3
1992
1995
1998
2001
2004
2007
Male
Female
Prime Age
55+
No College
Any College

Synthetic Control Estimates: Machine Learning Methods

Machine Learning Methods

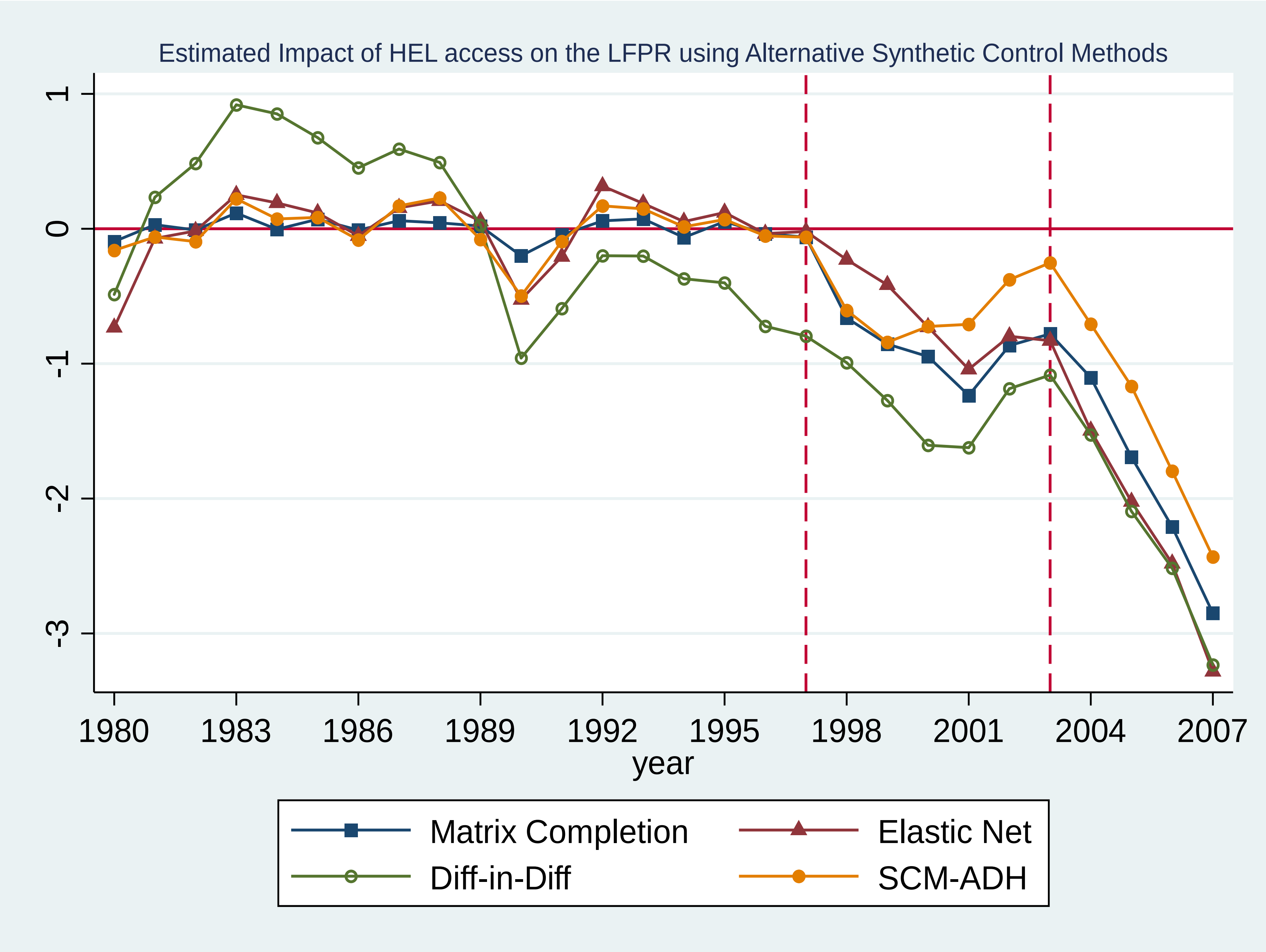
- DID and SCM-ADH nested within a general framework (Doudchenko and Imbens, 2016)

$$\hat{Y}^{N}_{TXT} = \kappa + \sum w_i Y_{iT}$$

- Potential restrictions for identifications
  - zero intercept ($\kappa = 0$), adding up ($\sum w_i = 1$), non-negative weights ($w_i > 0$), constant weights ($w_i = \overline{w}$)
- DID imposes the last three and SCM-ADH imposes the first three
- Relaxing some restrictions may reduce bias
- Improved methods to estimate synthetic controls:
  - SCM with Elastic Net penalty (Doudchenko and Imbens, 2016)
  - Matrix Completion (Athey et. al., 2017)
- Implement machine-learning methods extending data back to 1980

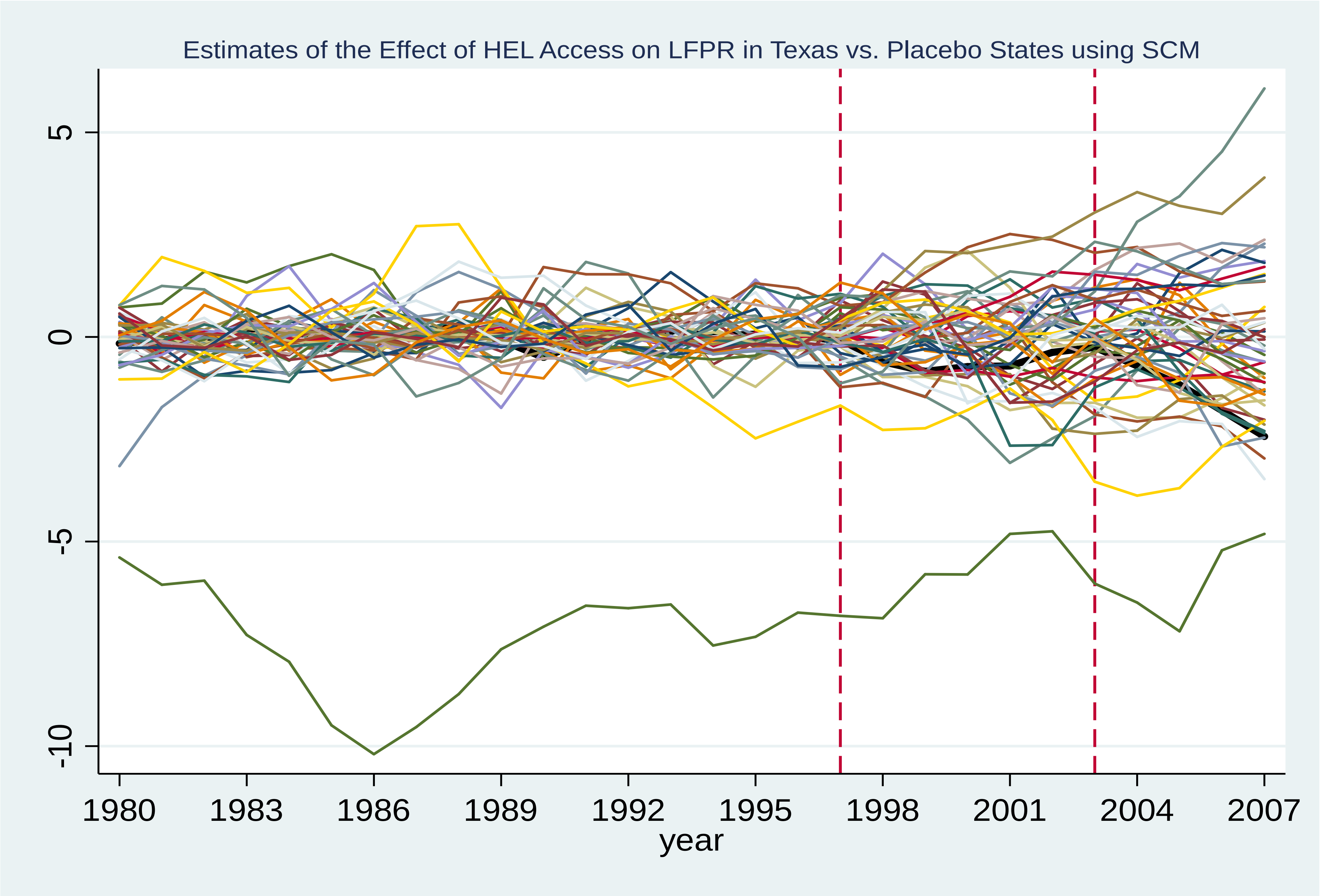
year	lfpr48	lfpr2	lfpr16	lfpr21	lfpr22	lfpr30	lfpr32	lfpr35	lfpr38	lfpr40	lfpr54	lfpr56
1992	69.1	72.8	68.5	62.3	61.6	68.1	69.9	63.7	67.8	63.5	55	70.3
1993	69.1	73.3	69	62.3	60.4	67.5	70.2	63.7	68.9	63.6	54.7	70.2
1994	69.3	73.9	70.7	62.4	61.3	67.5	70.1	63.8	71	63.6	54.6	71
1995	69.3	73.2	70.1	62.8	61.3	67.6	69	63.7	71.1	63.4	54.7	71.2
1996	69.1	73.7	70.2	62.7	61.8	67.3	69.3	63.4	71.9	63.7	55.3	70.5
1997	69.1	73.9	70.5	63.8	62.3	67.2	69.4	63.3	72.3	64.1	55.4	69.4

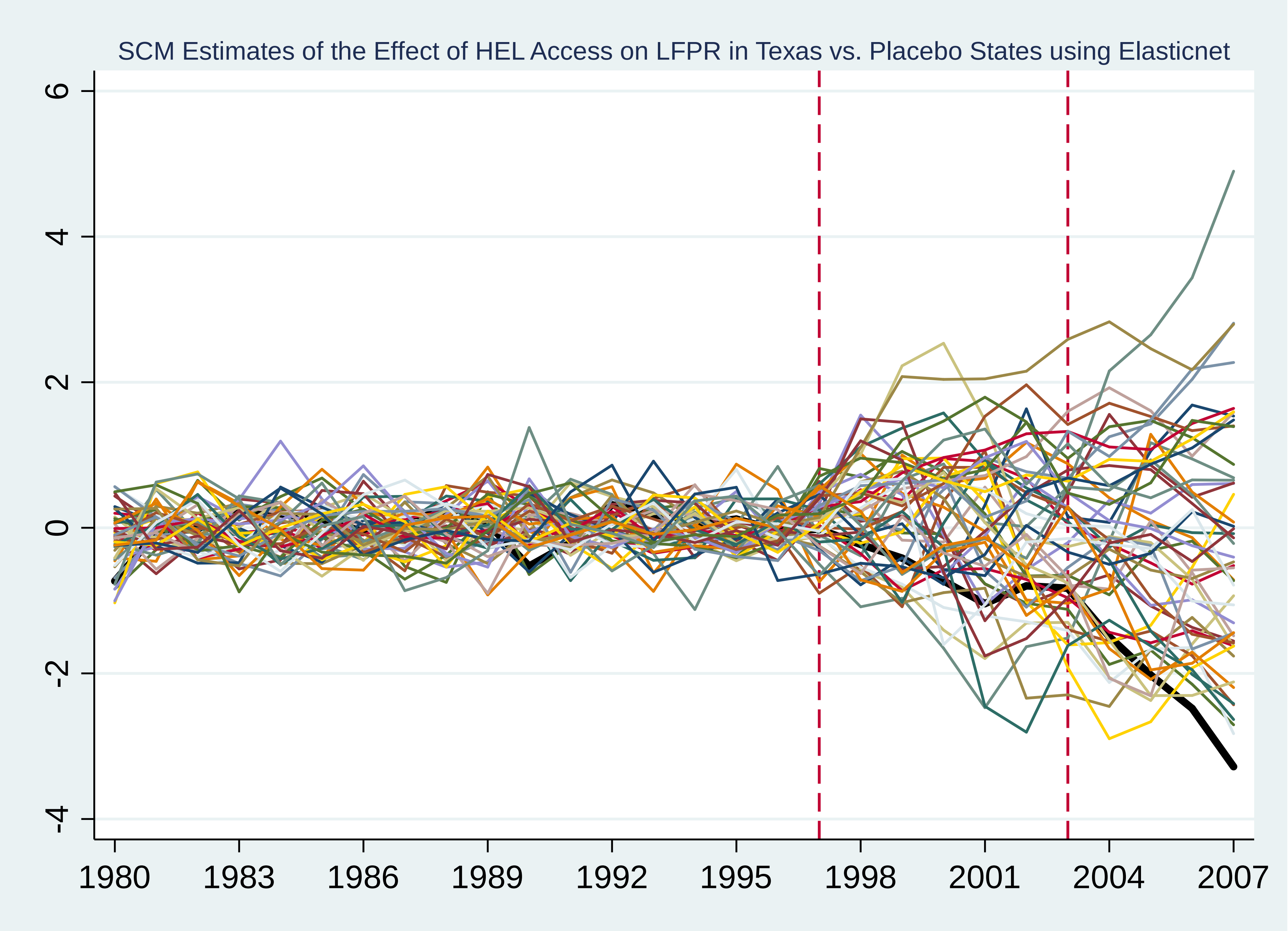
state	lfpr1992	lfpr1993	lfpr1994	lfpr1995	lfpr1996	lfpr1997	lfpr1998	lfpr1999	lfpr2000	lfpr2001	lfpr2002
TX	69.1	69.1	69.3	69.3	69.1	69.1	.	.	.	.	.
WY	70.3	70.2	71	71.2	70.5	69.4	70.2	71	71.6	71.8	71.1
WV	55	54.7	54.6	54.7	55.3	55.4	55.4	56.2	56.6	56.7	56
OK	63.5	63.6	63.6	63.4	63.7	64.1	64.6	64.7	64.4	64.6	64.6
NV	69.9	70.2	70.1	69	69.3	69.4	69.2	69.5	70.1	70.4	69.1
NM	63.7	63.7	63.8	63.7	63.4	63.3	63.4	62.9	63	63.4	63.7
ND	67.8	68.9	71	71.1	71.9	72.3	71.9	70.7	70.6	70.5	70.3
MT	68.1	67.5	67.5	67.6	67.3	67.2	68	68.2	68	67.2	66.7
LA	61.6	60.4	61.3	61.3	61.8	62.3	62.8	62.2	61.9	61.5	60.6
KY	62.3	62.3	62.4	62.8	62.7	63.8	63.7	64	63.7	63	62.1
ID	68.5	69	70.7	70.1	70.2	70.5	70.8	69.8	69.4	69.9	69.3
AK	72.8	73.3	73.9	73.2	73.7	73.9	74	73.5	73.3	72.5	72.2

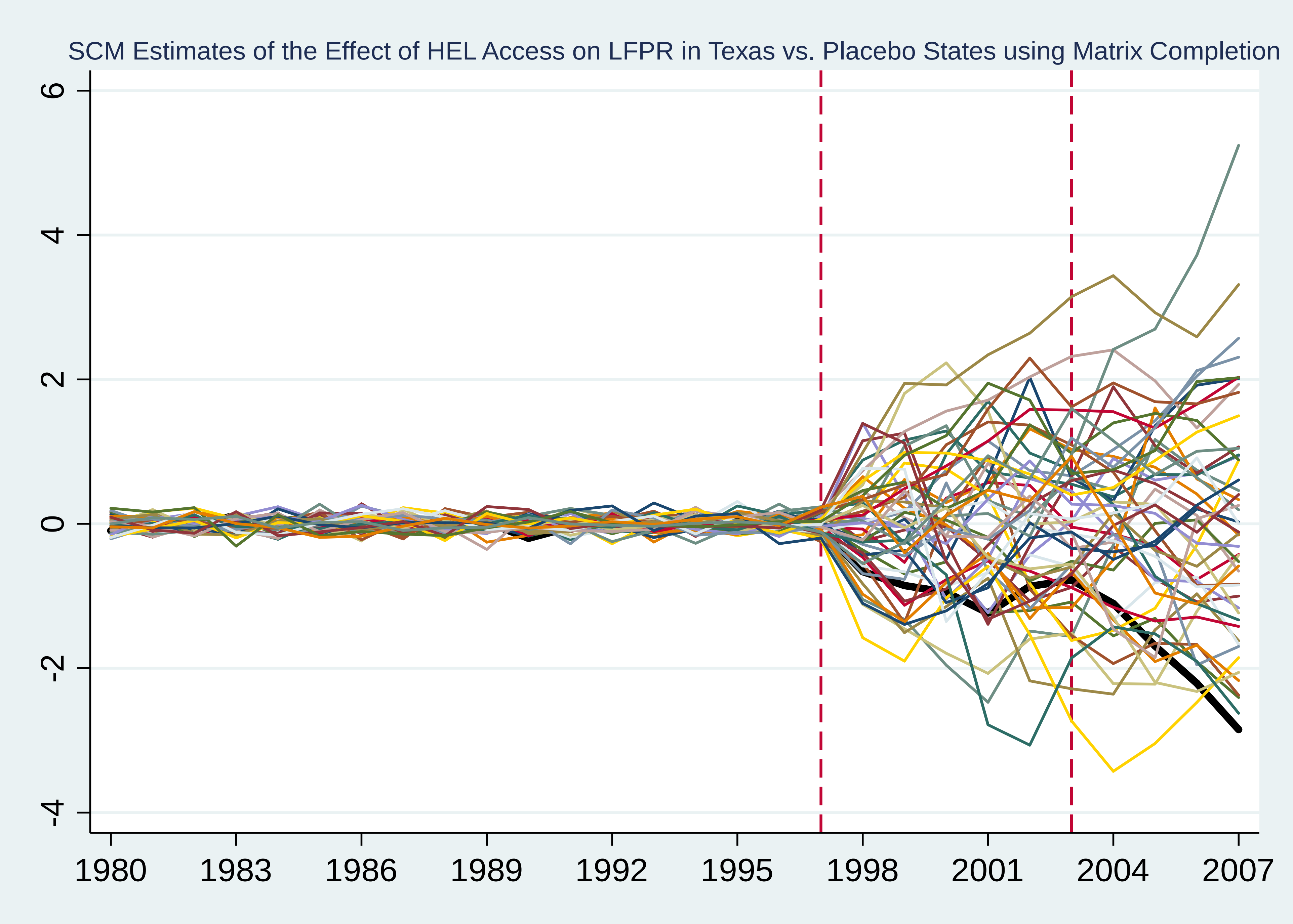

Estimated Impact of HEL access on the LFPR using Alternative Synthetic Control Methods
1
0
-1
-2
-3
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
year
Matrix Completion
Elastic Net
Diff-in-Diff
SCM-ADH

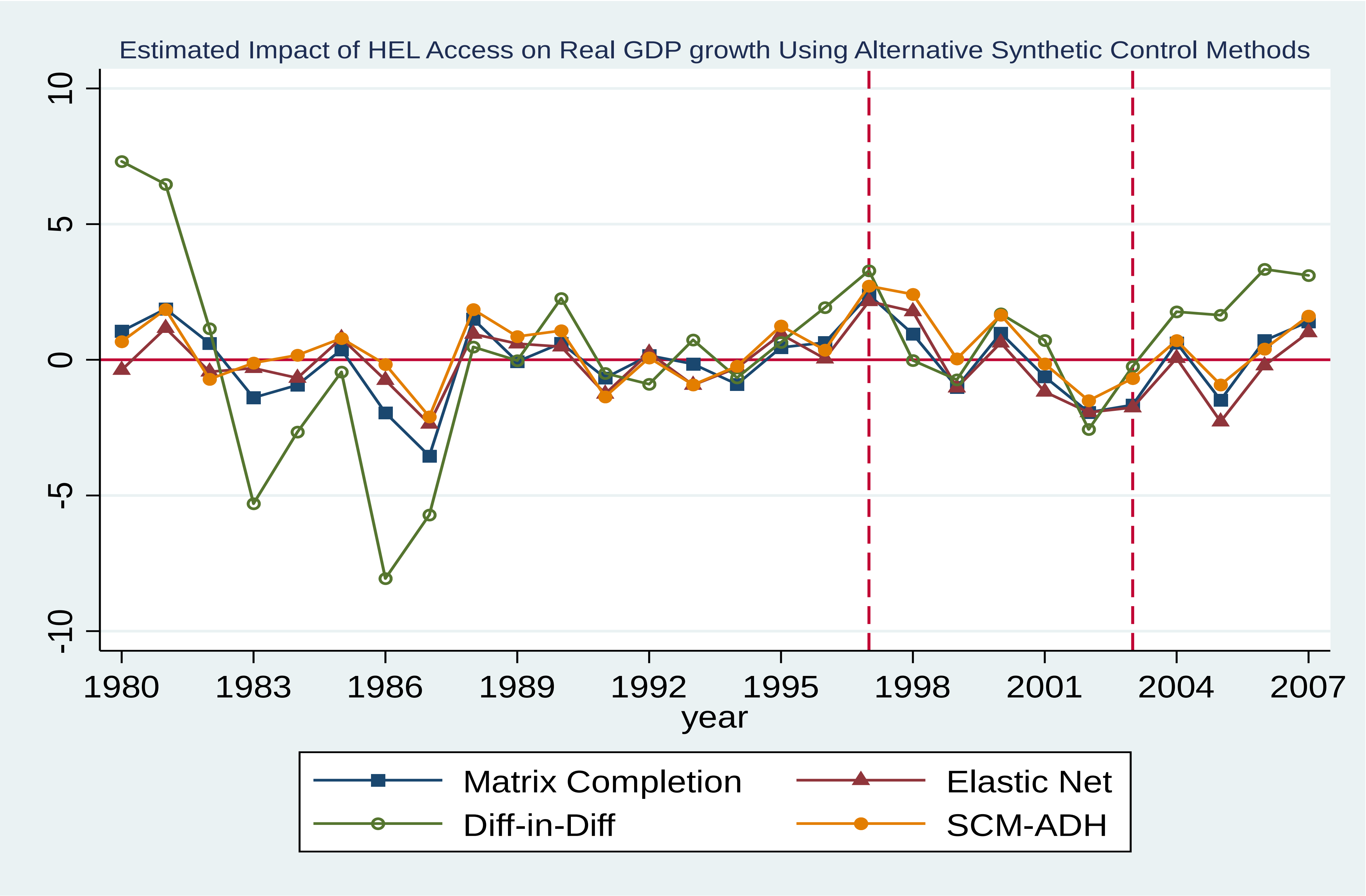
Estimated Treatment Effects of Home Equity Access on LFPR from Alternative SCM Methods with Standardized P-Values

	(1) Diff-in-Diff	(2) SCM	(3) Elastic Net	(4) Matrix Completion
Treatment Effect	-1.713	-0.961	-1.332	-1.320
Std. P-value	0.0816	0.0816	0.0816	0.0816
Pre-Mean Effect	8.68e-15	-0.000237	2.37e-15	0.0000518
Pre-Std. P-value	0.816	0.898	0.776	0.918
Pre-RMSPE: TX	0.585	0.169	0.258	0.0738
Pre-RMSPE: Ctrls	1.000	0.620	0.321	0.102


Estimates of the Effect of HEL Access on LFPR in Texas vs. Placebo States using SCM
5
0
-5
-10
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
year


SCM Estimates of the Effect of HEL Access on LFPR in Texas vs. Placebo States using Elasticnet
6
4
2
0
-2
-4
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007


SCM Estimates of the Effect of HEL Access on LFPR in Texas vs. Placebo States using Matrix Completion
6
4
2
0
-2
-4
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007



Estimated Impact of HEL Access on Real GDP growth Using Alternative Synthetic Control Methods
10
5
0
-5
-10
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
year
Matrix Completion
Elastic Net
Diff-in-Diff
SCM-ADH

Estimated Treatment Effects of Home Equity Access on Real GDP Growth with Standardized P-Values

	(1) Diff-in-Diff	(2) SCM	(3) Elastic Net	(4) Matrix Completion
Treatment Effect	0.872	0.357	-0.491	-0.204
Std. P-value	0.959	0.837	0.837	0.959
Pre-Mean Effect	1.17e-16	0.337	3.70e-17	0.00304
Pre-Std. P-value	0.143	0.429	0.429	0.367
Pre-RMSPE: TX	3.741	1.218	1.017	1.386
Pre-RMSPE: Ctrls	2.980	1.541	1.119	1.328

Conclusion

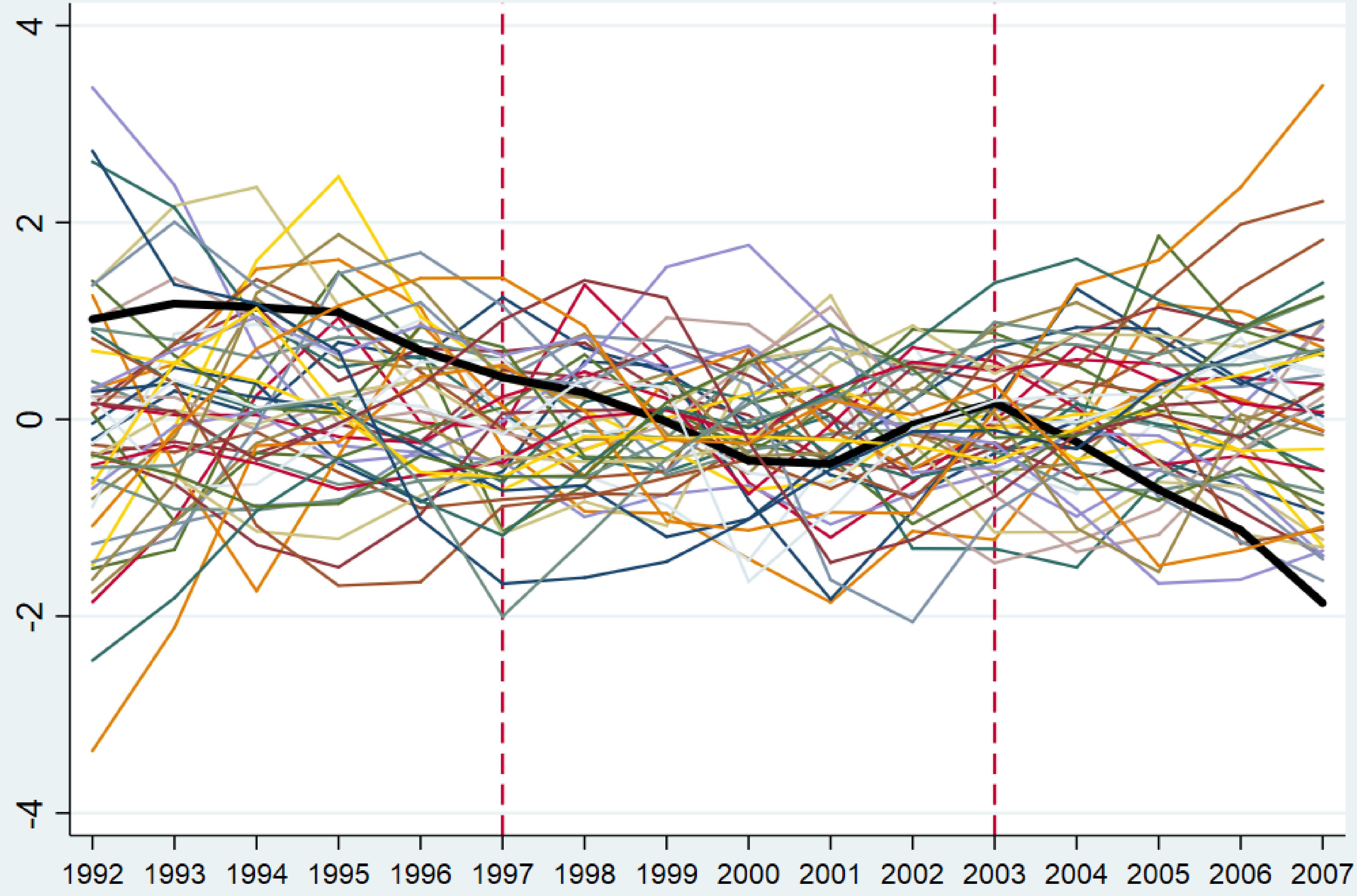
- Easier access to housing credit in Texas led to a notable decline in LFPR between 1998 and 2007
  - Access to HELOC had a larger negative effects
- Negative effect of easier home equity access on LFP concentrated among homeowners, with little discernible impact on renters
- Easier credit access led to relatively larger declines in LFPR of females, prime-age population, and the college-educated
- Muted effect on GDP growth
- Labor market effects of easier credit access should be an important factor in assessing its stimulative impact on overall growth

Caveats

- Differential impact of changes in oil prices on Texas vs. other states
  - Estimates robust to restricting donor pool to energy-intensive states
- Welfare reform and changes in means-tested program rules in the 1990’s could have affected different states differently
  - Estimates robust to restricting donor pool to states with similar policy changes
- Texas may have been differentially affected by the 2001 recession and the following jobless recovery

Back-up Slides

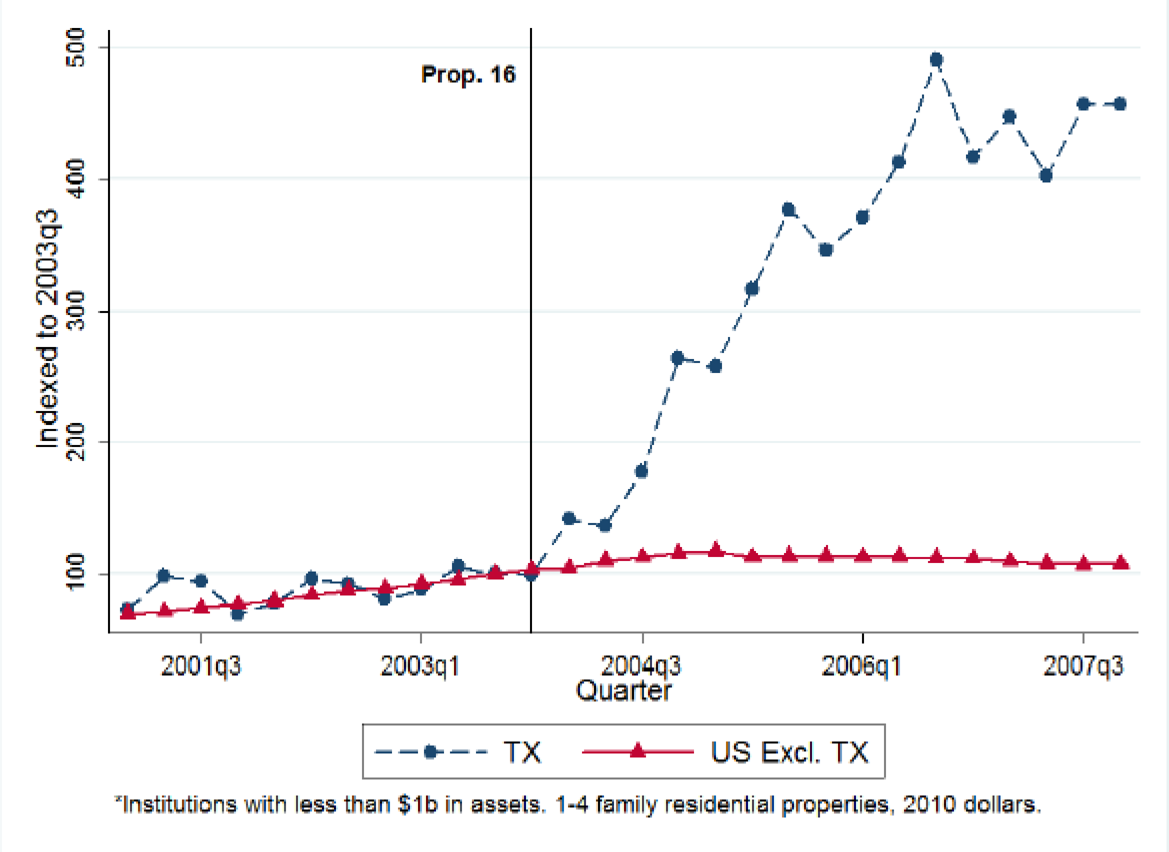
Trends in Demeaned LFPR Across States



First Stage: Effect of Amendments on HEL/HELOC

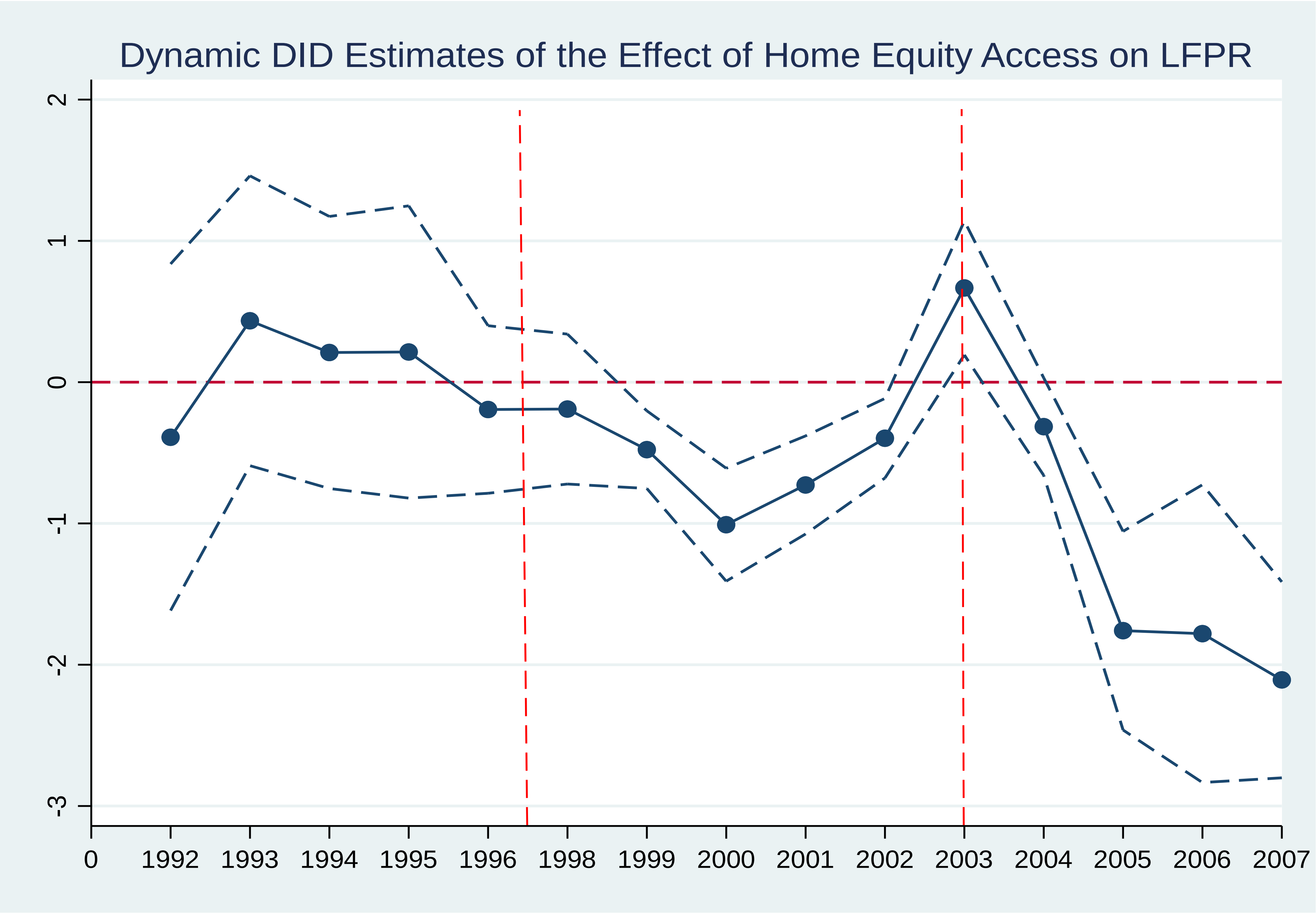
- Number of homeowners with HEL increased from 2.5% in 1997 to 4.5% in 1999 and 6.4% in 2001 (Combs, 2003; Abdallah and Lastrapes, 2012)
- Number of HELs rose 73% from 1998 to 1999, value from $900 million to $2.9 billion, and average HEL size from $36,750 in 1998-2000 to $47,000 in 2001-2002 (Texas OCCC, Abdallah and Lastrapes, 2012)

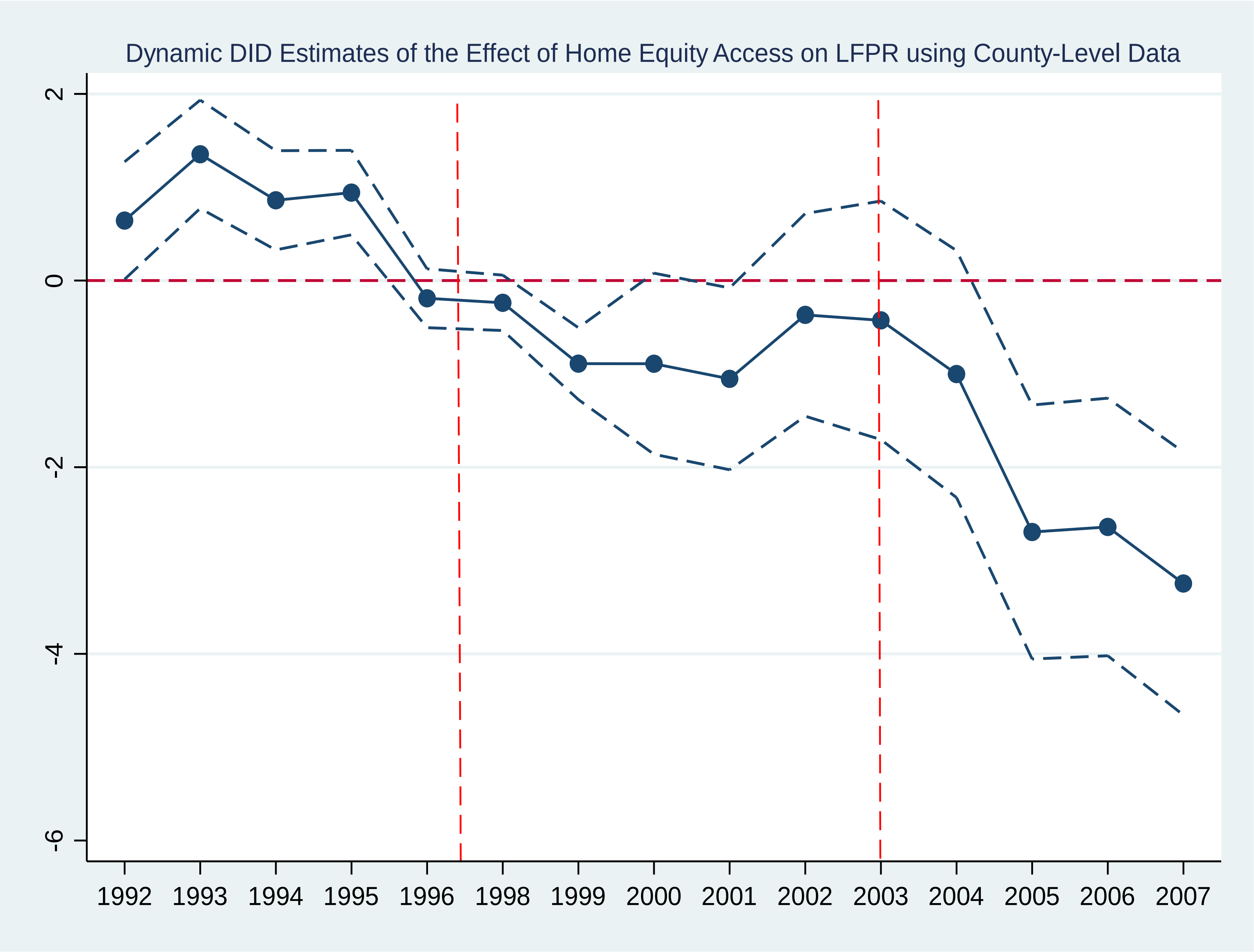
Figure 4: Amount of HELOCs Issued by Small Institutions

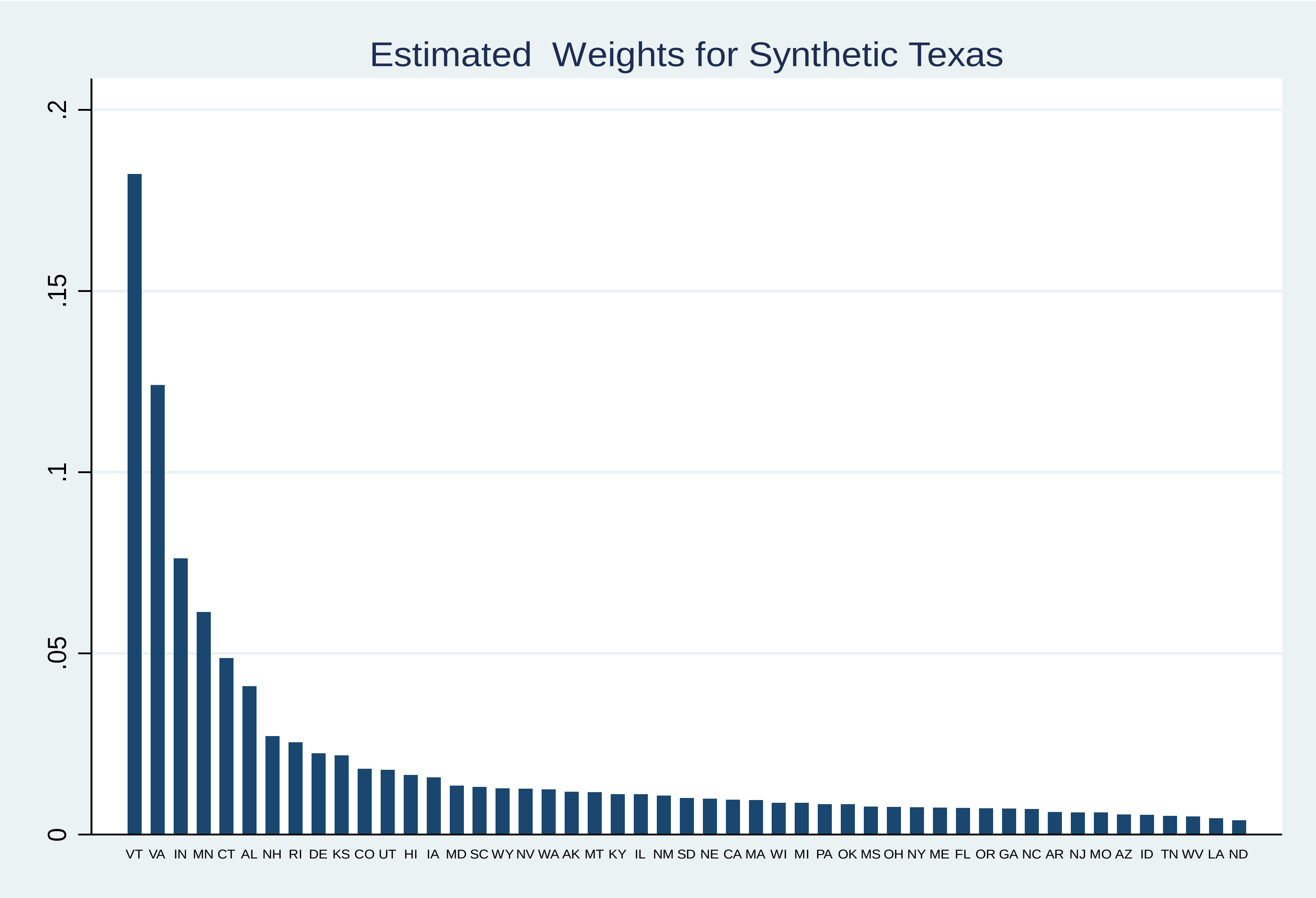


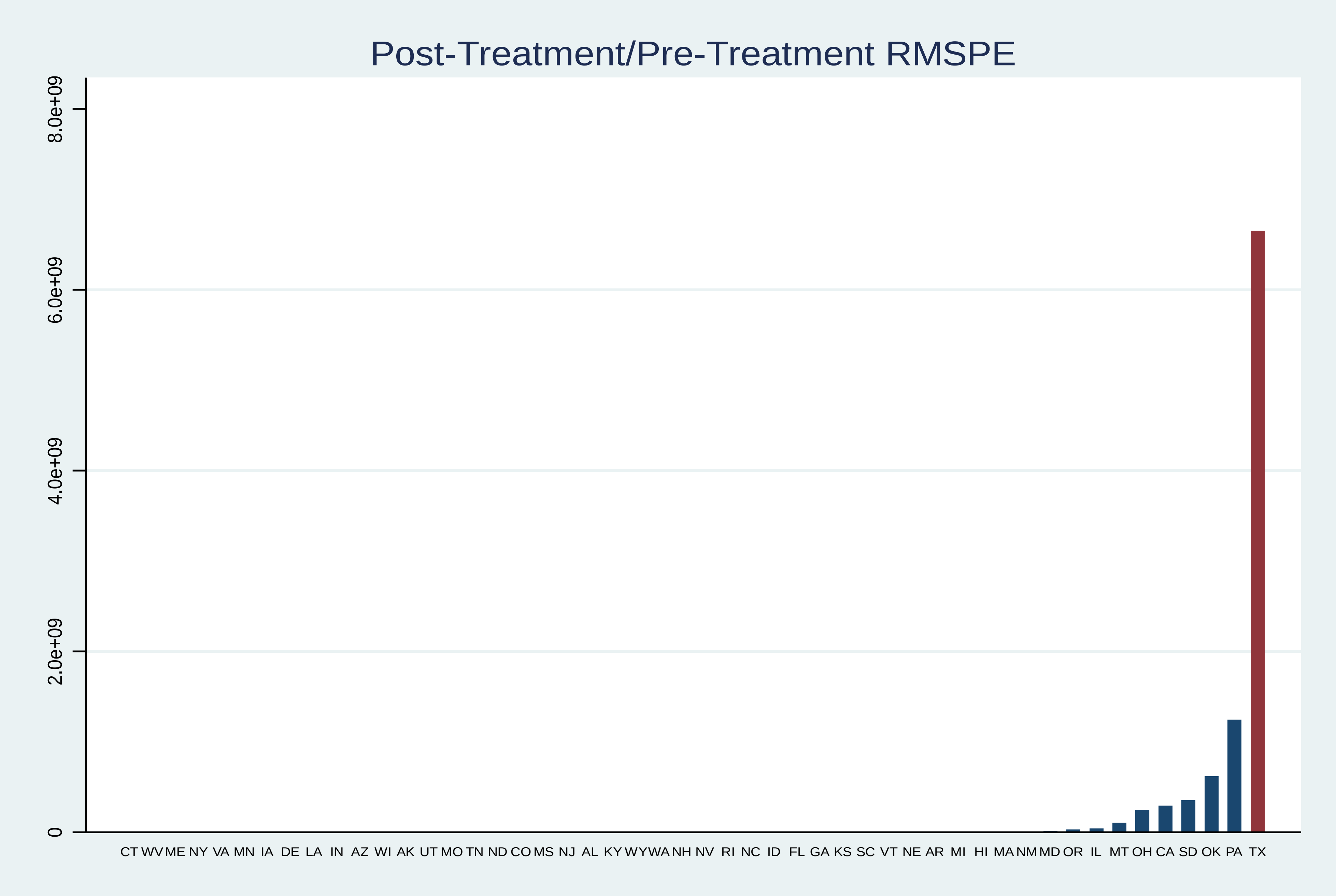
Source: Author's calculations using Call Report data from the FFIEC.

Source: Stolper (2015)

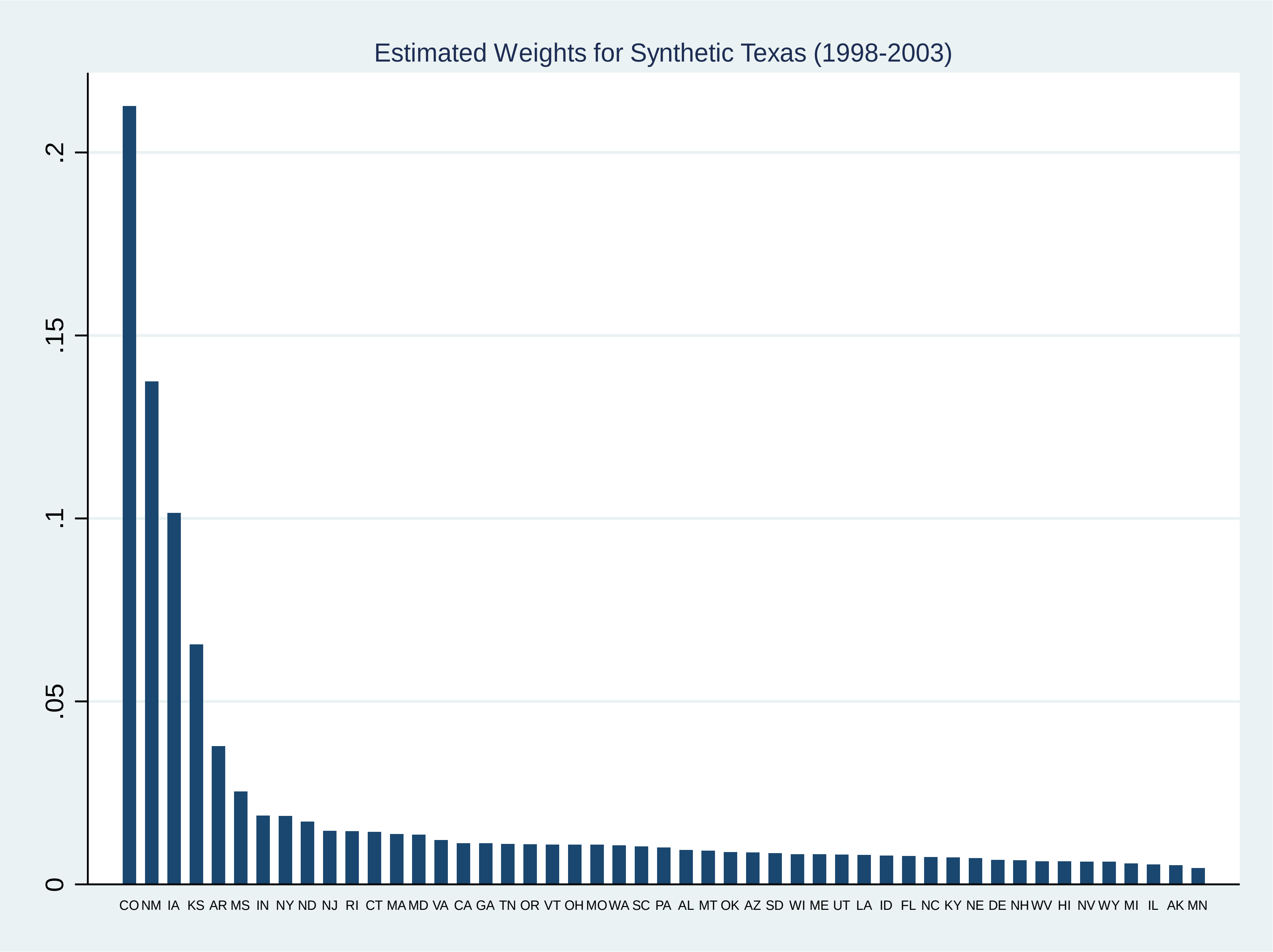

Dynamic DID Estimates of the Effect of Home Equity Access on LFPR
2
1
0
-1
-2
-3
0
1992
1993
1994
1995
1996
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007


Dynamic DID Estimates of the Effect of Home Equity Access on LFPR using County-Level Data
2
0
-2
-4
-6
1992
1993
1994
1995
1996
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007

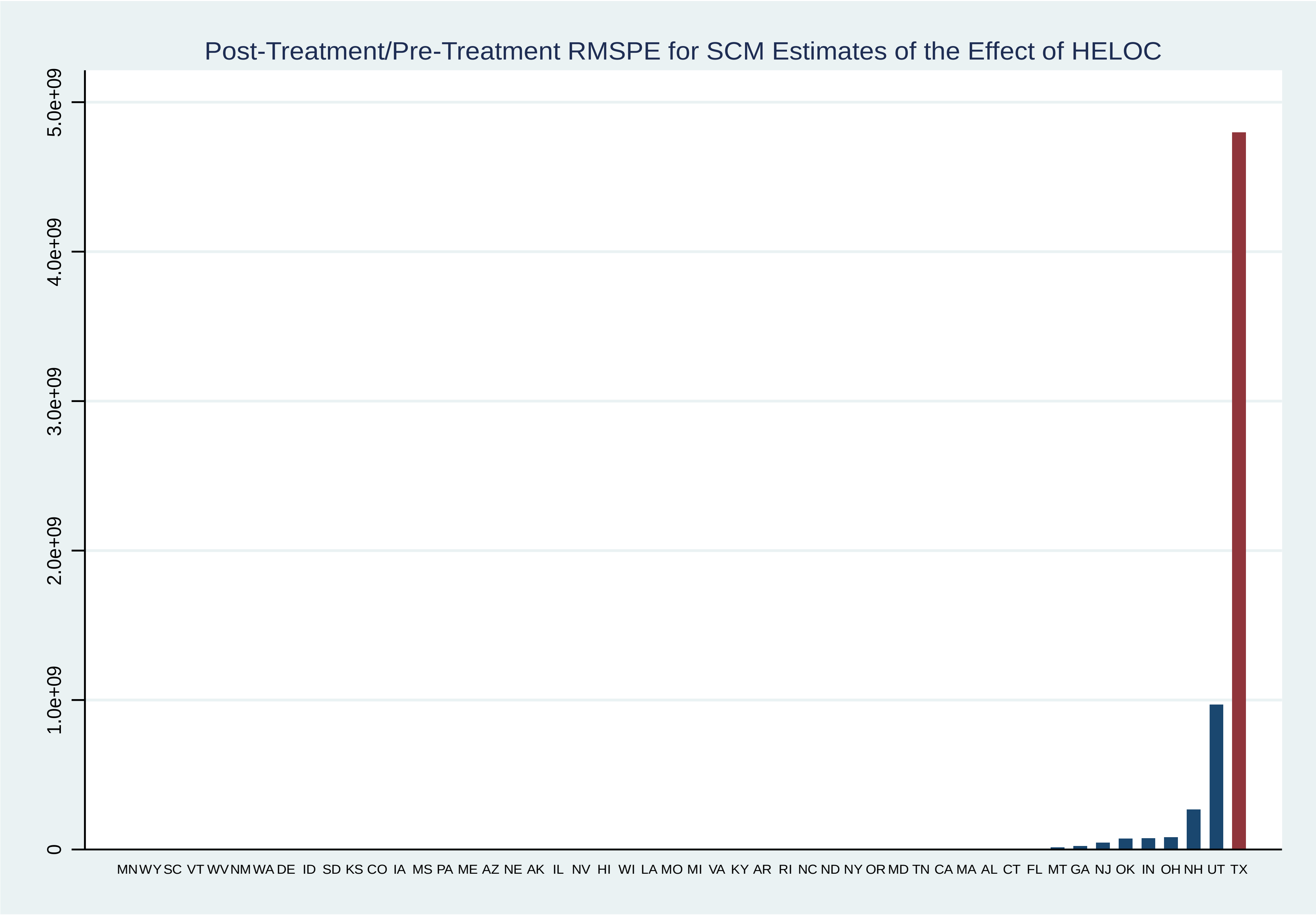

Estimated Weights for Synthetic Texas
0
.05
.1
.15
.2
VT VA IN MN CT AL NH RI DE KS CO UT HI IA MD SC WY NV WA AK MT KY IL NM SD NE CA MA WI MI PA OK MS OH NY ME FL OR GA NC AR NJ MO AZ ID TN WV LA ND

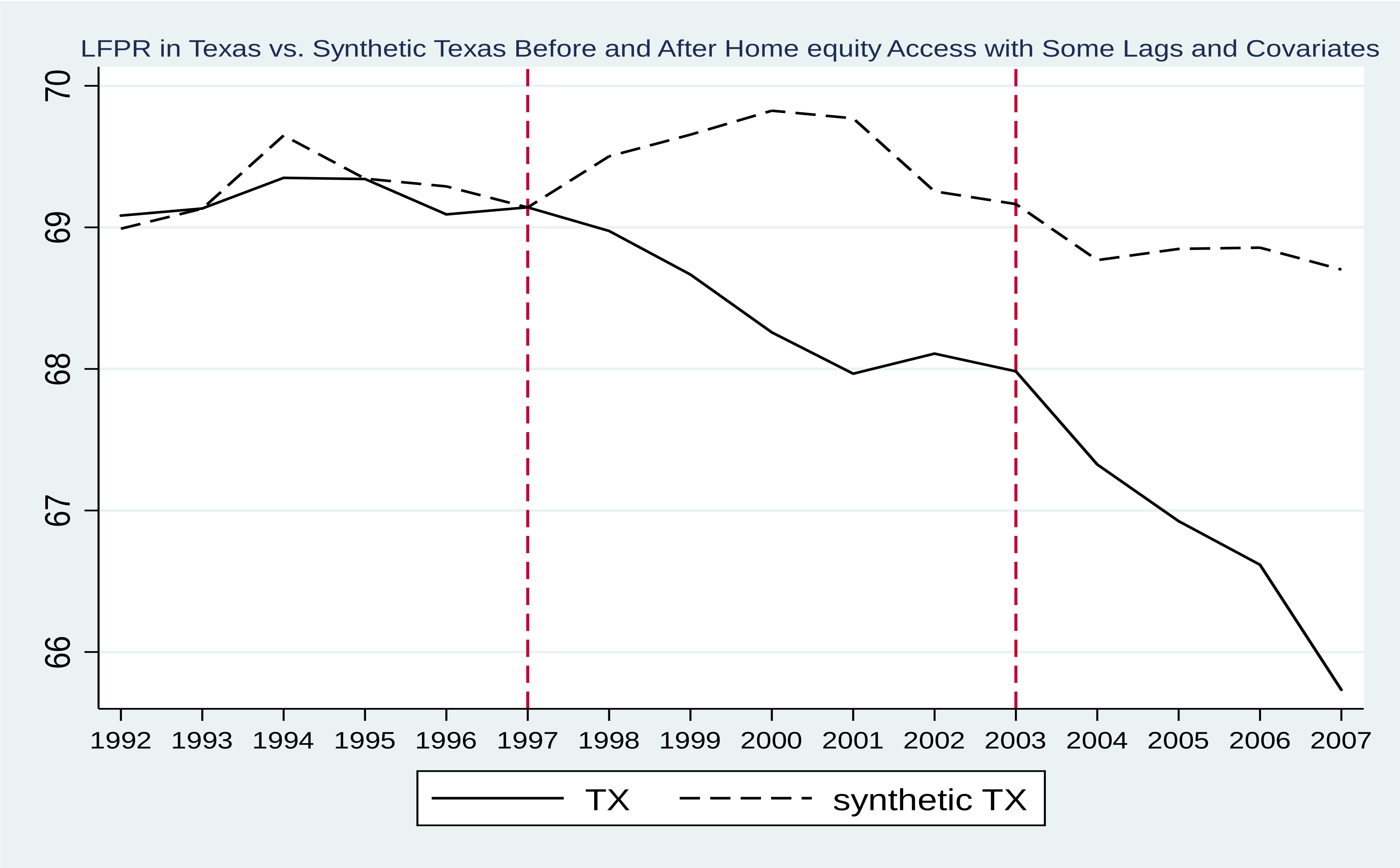


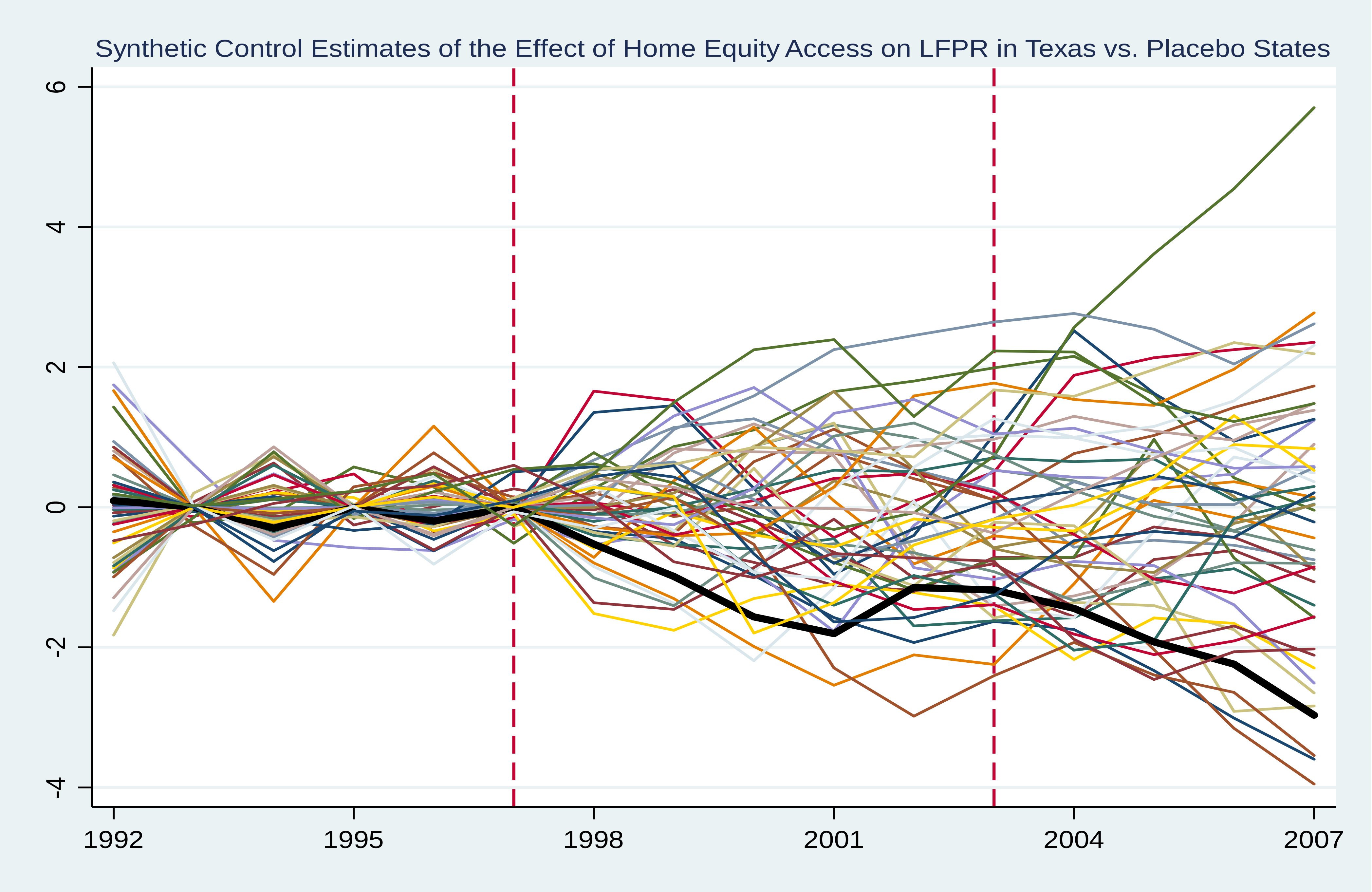
Post-Treatment/Pre-Treatment RMSPE
0
2.0e+09
4.0e+09
6.0e+09
8.0e+09
CT WV ME NY VA MN IA DE LA IN AZ WI AK UT MO TN ND CO MS NJ AL KY WY WA NH NV RI NC ID FL GA KS SC VT NE AR MI HI MA NM MD OR IL MT OH CA SD OK PA TX



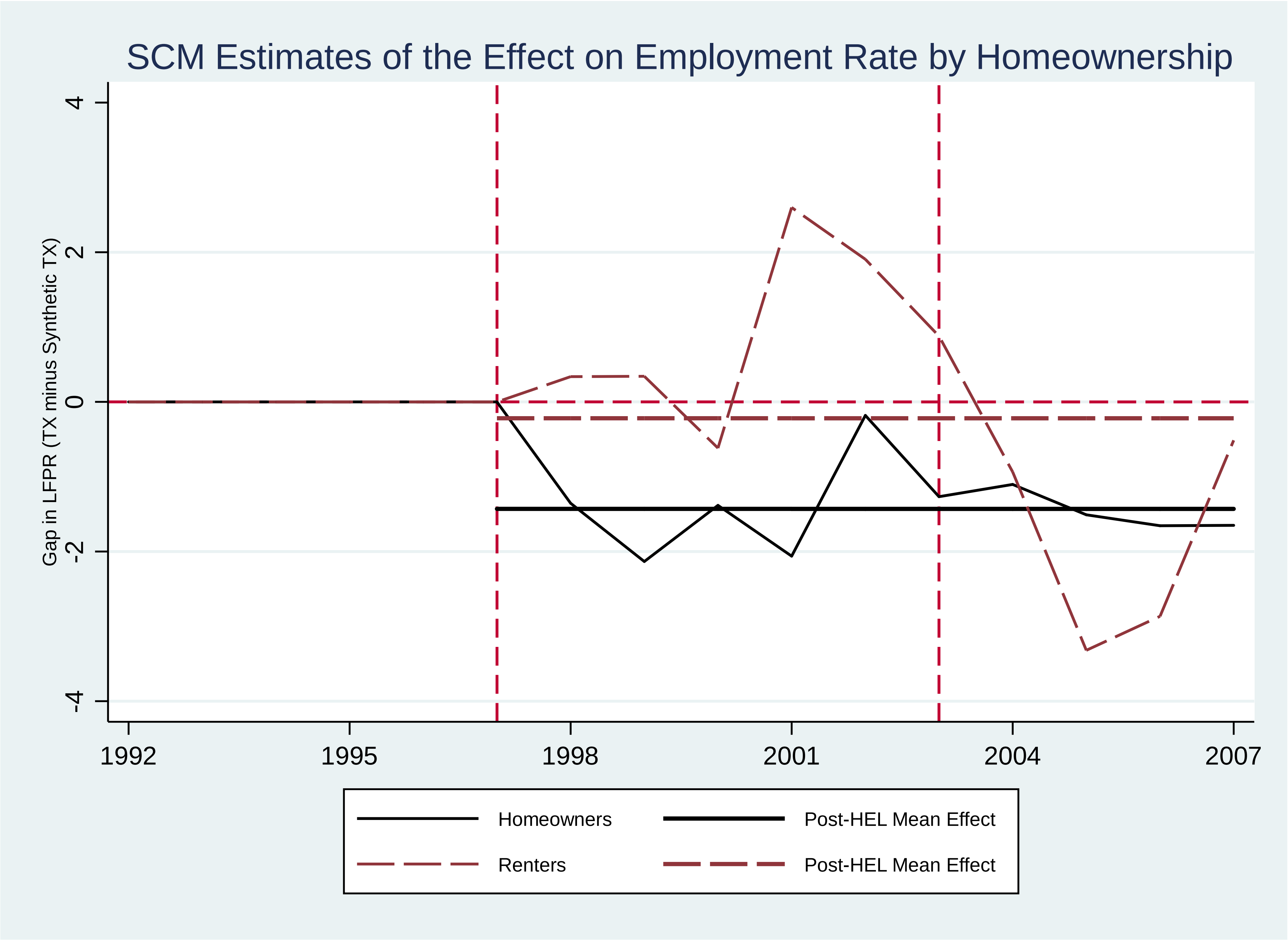
Estimated Weights for Synthetic Texas (1998-2003)
0
.05
.1
.15
.2
CO NM IA KS AR MS IN NY ND NJ RI CT MA MD VA CA GA TN OR VT OH MO WA SC PA AL MT OK AZ SD WI ME UT LA ID FL NC KY NE DE NH WV HI NV WY MI IL AK MN

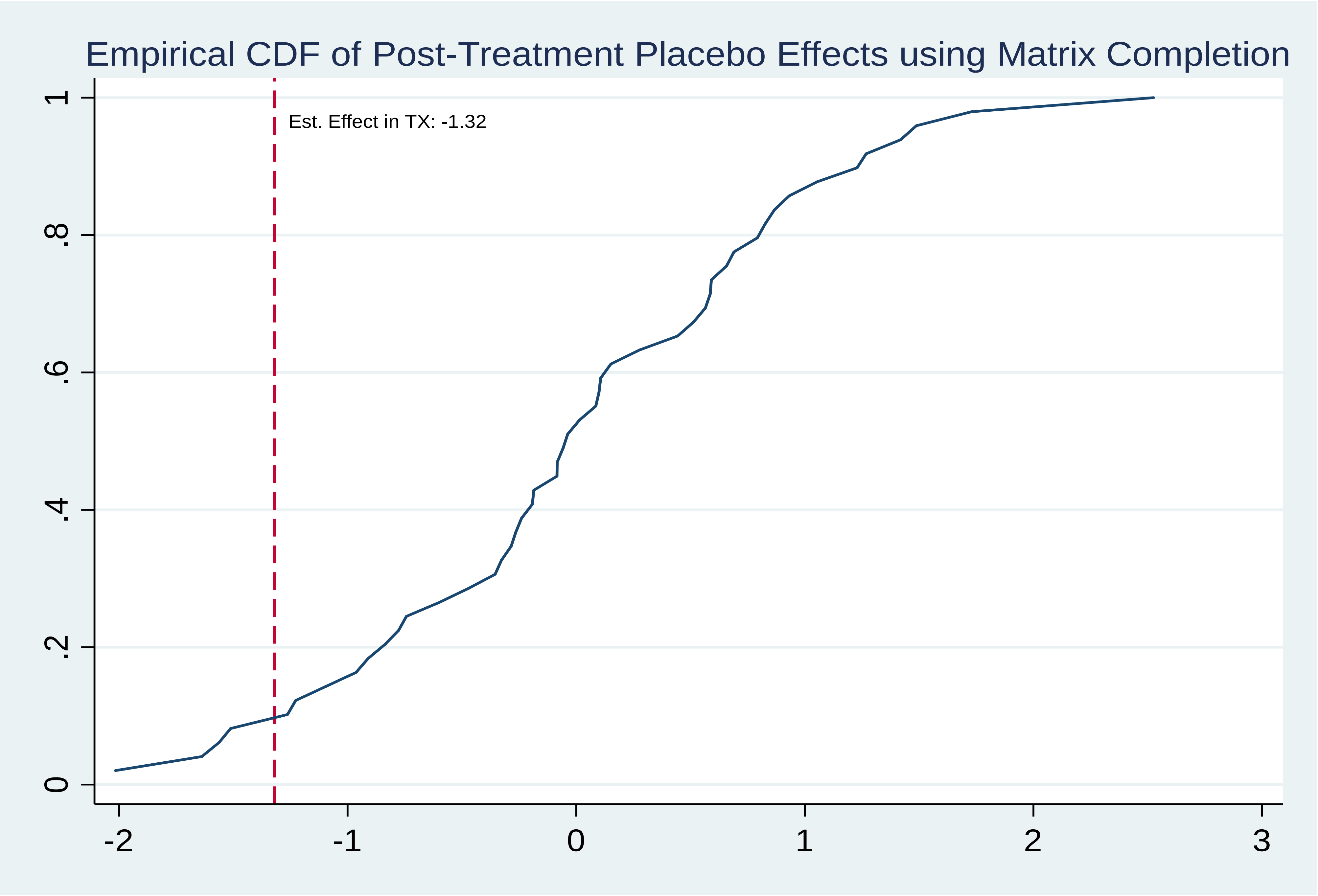

Post-Treatment/Pre-Treatment RMSPE for SCM Estimates of the Effect of HELOC
0
1.0e+09
2.0e+09
3.0e+09
4.0e+09
5.0e+09
MN WY SC VT WV NM WA DE ID SD KS CO IA MS PA ME AZ NE AK IL NV HI WI LA MO MI VA KY AR RI NC ND NY OR MD TN CA MA AL CT FL MT GA NJ OK IN OH NH UT TX

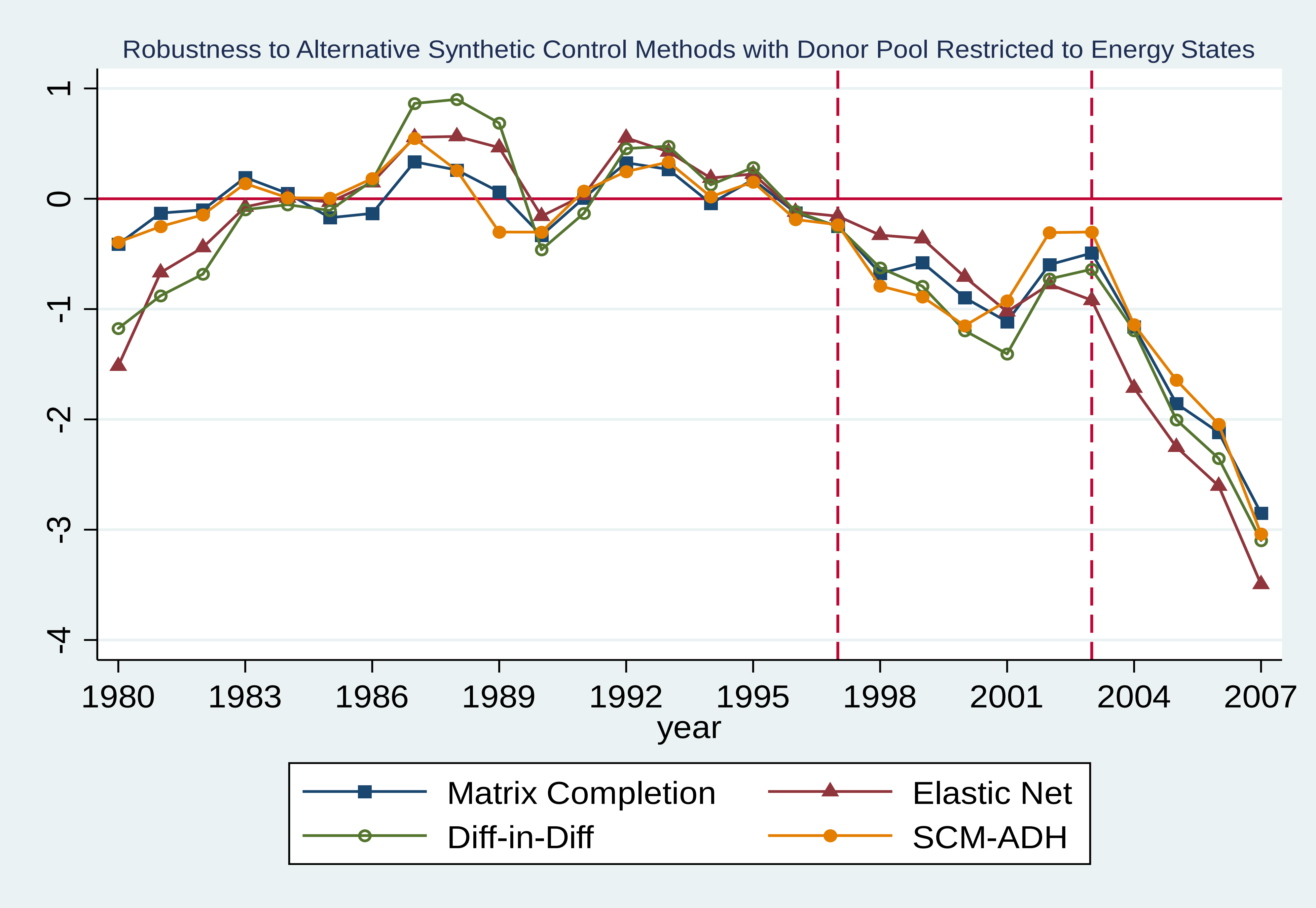

LFPR in Texas vs. Synthetic Texas Before and After Home equity Access with Some Lags and Covariates
70
69
68
67
66
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
TX
synthetic TX



Synthetic Control Estimates of the Effect of Home Equity Access on LFPR in Texas vs. Placebo States
6
4
2
0
-2
-4
1992
1995
1998
2001
2004
2007


SCM Estimates of the Effect on Employment Rate by Homeownership
Gap in LFPR (TX minus Synthetic TX)
4
2
0
-2
-4
1992
1995
1998
2001
2004
2007
Homeowners
Post-HEL Mean Effect
Renters
Post-HEL Mean Effect


Empirical CDF of Post-Treatment Placebo Effects using Matrix Completion
Est. Effect in TX: -1.32
0
.2
.4
.6
.8
1
-2
-1
0
1
2
3


Robustness to Alternative Synthetic Control Methods with Donor Pool Restricted to Energy States
1
0
-1
-2
-3
-4
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
year
Matrix Completion
Elastic Net
Diff-in-Diff
SCM-ADH

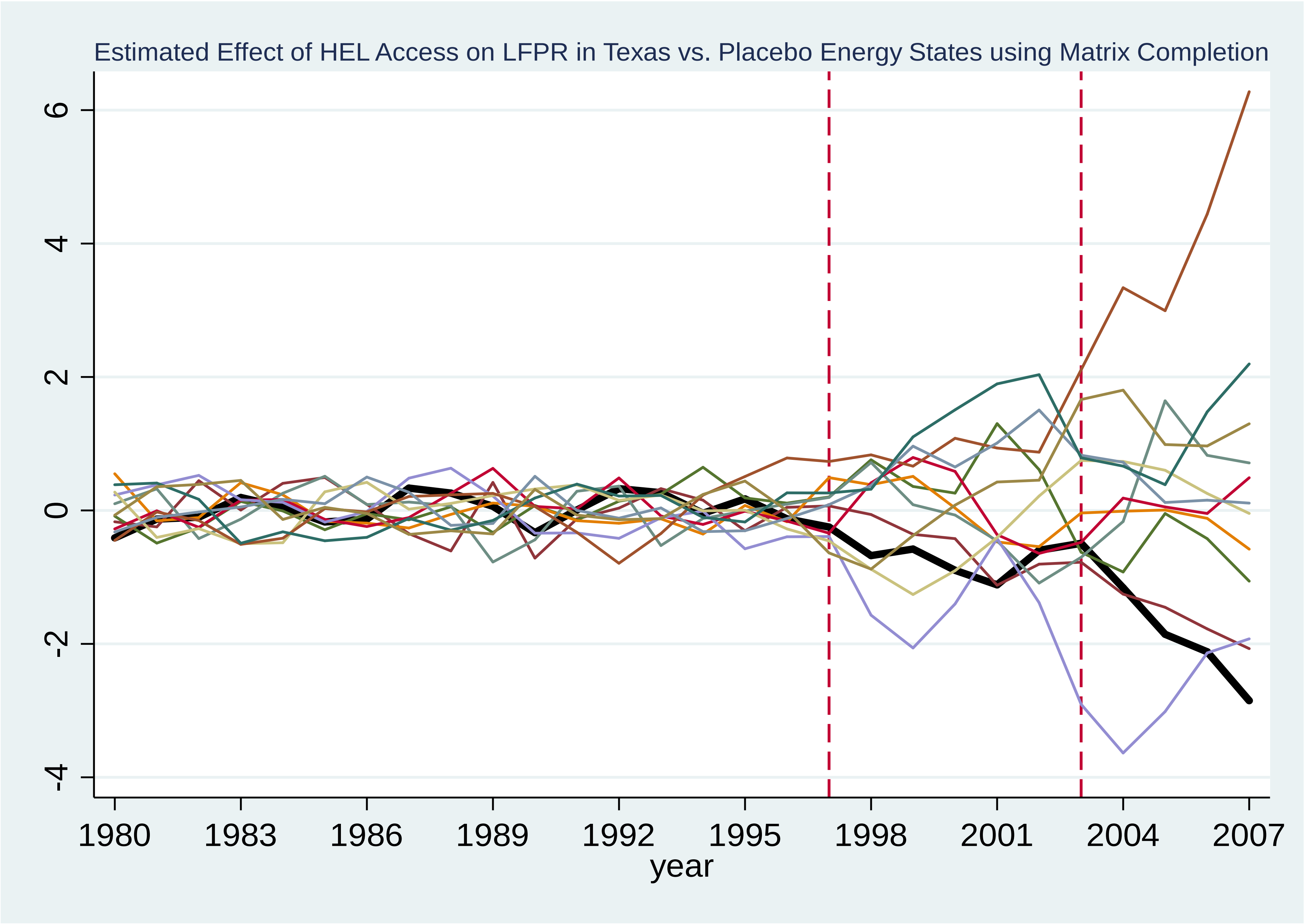

Estimated Effect of HEL Access on LFPR in Texas vs. Placebo Energy States using Matrix Completion
6
4
2
0
-2
-4
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
year

Table A1: Summary Statistics

	Pre-Treatment (1993-1997)		Post-Treatment 1998-2007	
	Rest of US	Texas	Rest of US	Texas
LFPR	66.48	69.19	66.43	67.61
	(3.452)	(0.122)	(3.129)	(1.007)
Log Real Wage*	2.971	2.896	2.989	2.864
	(0.114)	(0.0144)	(0.108)	(0.0481)
Avg. State Tax rate	0.0218	0	0.0230	0
	(0.00975)	(0)	(0.0107)	(0)
Log FHFA HPI	5.258	4.882	5.698	5.206
	(0.206)	(0.0428)	(0.343)	(0.133)
Age	43.35	41.37	44.30	42.37
	(1.142)	(0.175)	(1.202)	(0.522)
Share Female	0.521	0.514	0.519	0.514
	(0.00909)	(0.00207)	(0.00809)	(0.00178)
Share Married	0.565	0.586	0.549	0.571
	(0.0244)	(0.00398)	(0.0241)	(0.00574)
Households with Children	0.331	0.376	0.316	0.360
	(0.0210)	(0.00644)	(0.0207)	(0.0129)
Share White	0.759	0.581	0.717	0.515
	(0.123)	(0.0145)	(0.134)	(0.0187)
Share Black	0.113	0.111	0.113	0.109
	(0.0787)	(0.00215)	(0.0778)	(0.00427)
Share High School Grad	0.334	0.291	0.315	0.274
	(0.0435)	(0.00736)	(0.0443)	(0.00537)
Share College Grad	0.202	0.186	0.239	0.214
	(0.0356)	(0.00509)	(0.0402)	(0.00703)

Table 1: Difference in Differences Estimates of Home Equity Access on LFPR

	(1)	(2)	(3)	(4)
Panel A: All States Sample				
Texas X 1998-2003	-1.080	-0.764	-0.410	-0.502
	(0.144)	(0.117)	(0.498)	(0.436)
	[-1.723, 0.140]	[-1.281, 0.136]	[-1.174, 0.285]	[-1.208, 0.095]
Texas X Post 2003	-2.069	-1.198	-1.566	-1.267
	(0.219)	(0.225)	(0.359)	(0.683)
	[-3.811, -0.808]	[-2.819, -0.079]	[-2.696, -0.541]	[-1.731, -0.724]
Panel B: Energy States Sample				
Texas X 1998-2003	-1.152	-0.688	-1.015	-0.834
	(0.152)	(0.130)	(0.271)	(0.356)
	[-2.012, -0.595]	[-1.589, -0.077]	[-1.689, -0.619]	[-1.360, -0.386]
Texas X Post 2003	-2.357	-1.722	-2.332	-1.566
	(0.290)	(0.292)	(0.437)	(0.839)
	[-5.826, -1.759]	[-3.792, -1.091]	[-3.260, -1.649]	[-1.920, -1.220]
State and Year Fixed Effects	Yes	Yes	Yes	Yes
Other Covariates	No	Yes	Yes	Yes
Division X Year Effects	No	No	Yes	Yes
State X Linear Trend	No	No	No	Yes
Observations (Panel A)	800	797	797	797
AdjR-Sq (Panel A)	0.943	0.963	0.969	0.978

Table 2: Heterogeneity in DID Estimates of Home Equity Access on LFPR

	(1) Male	(2) Female	(3) Prime-Age	(4) Age-55+	(5) No-College	(6) Any-College
Panel A: DID Estimates without State-Specific Linear Time Trends						
Texas X 1998-2003	-0.376	-0.639	-1.436	1.477	0.269	-1.886
	(0.536)	(0.802)	(0.381)	(0.890)	(0.631)	(0.745)
	[-1.226, 1.143]	[-1.671, 0.725]	[-2.312, -0.567]	[-0.659, 3.363]	[-0.847, 1.679]	[-2.845, -0.599]
Texas X Post 2003	-1.165	-2.245	-1.819	0.004	-1.297	-2.671
	(0.230)	(0.716)	(0.635)	(0.303)	(0.796)	(0.922)
	[-3.313, 0.112]	[-4.352, -0.893]	[-3.485, -0.517]	[-2.755, 3.047]	[-3.496, 0.471]	[-4.714, -1.408]
Panel B: DID Estimates with State-Specific Linear Time Trends						
Texas X 1998-2003	-0.094	0.069	-0.910	0.428	1.310	-2.253
	(0.724)	(0.866)	(0.244)	(1.934)	(0.561)	(0.868)
	[-0.965, 1.369]	[-1.007, 1.350]	[-1.825, -0.077]	[-1.718, 2.652]	[0.181, 2.491]	[-3.254, -0.895]
Texas X Post 2003	-0.646	-0.969	-0.876	-1.900	0.586	-3.341
	(0.609)	(0.693)	(0.816)	(2.210)	(0.428)	(1.034)
	[-1.699, 0.071]	[-1.667, -0.306]	[-1.656, -0.135]	[-3.238, -0.496]	[-0.277, 1.237]	[-4.462, -2.666]
State/Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Division X Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	63372	65417	48508	41464	67219	61570
AdjR-Sq	0.890	0.891	0.675	0.753	0.876	0.839