

Appendix

Table A1. Propensity Score Matching Estimation to Select Set of Nontreated Firms, 2004

Variables	Coefficients (SE)	Percent bias		Percent reduction /bias/
		Before	After	
ln(Value added)	0.26** (0.03)	29.7**	-1.1	96.3
ln(Labor)	-0.42** (0.03)	-17.5**	-2.8	84.0
ln(Capital)	0.06** (0.02)	14.1**	-2.5	82.6
ln(Intermediate)	0.16** (0.03)	28.3**	-3.2	88.6
ln(Age)	0.09** (0.03)	12.8**	-2.1	83.4
Constant	-2.95** (0.22)			
Pseudo R-squared	0.06			

Note: * $p < 0.05$, ** $p < 0.01$

Table A2. DiD results on COD intensity

	(1)	(2)	(3)	(4)
	ln(COD int)	ln(COD int)	ln(COD int)	ln(COD int)
	OLS	FE	FE	FE
Tai×Post2004	-0.278**	-0.298**	-0.298**	-0.277**
	(0.068)	(0.063)	(0.063)	(0.068)
Post2004			0.035	
			(0.043)	
Tai	0.510**			
	(0.082)			
Constant	2.214**	2.395**	2.443**	2.395**
	(0.073)	(0.053)	(0.067)	(0.053)
Year Fixed Effects	YES	YES		YES
Quadratic Time Trend			YES	
Firm Fixed Effects		YES	YES	YES
Year-industry Fixed Effects				YES
Observations	11850	11850	11850	11850
R-squared	0.017	0.699	0.699	0.700

Note: Robust-clustered standard errors in parentheses. * p < 0.05, ** p < 0.01

Table A3. Robustness check: DiD results on COD and TFP using merged data

	(1)	(2)	(3)	(4)
	ln(COD)	ln(COD)	TFP	TFP
	FE	FE	FE	FE
Tai×Post2004	-0.192*	-0.183*	-0.117*	-0.086
	(0.077)	(0.083)	(0.052)	(0.054)
Post2004	0.003		0.109**	
	(0.055)		(0.033)	
Constant	10.161**	10.135**	5.930**	5.898**
	(0.108)	(0.087)	(0.067)	(0.051)
Year Fixed Effects		YES		YES
Quadratic Time Trend	YES		YES	
Firm Fixed Effects	YES	YES	YES	YES
Year-industry Fixed Effects		YES		YES
Observations	5243	5243	5243	5243
R-squared	0.767	0.769	0.726	0.731

Robust-clustered standard errors in parentheses. * p <0.05, ** p <0.01

Table A4. Robustness check: DiD results on TFP using OP method

	(1)	(2)	(3)	(4)
	TFP	TFP	TFP	TFP
	OLS	FE	FE	FE
Tai×Post2004	-0.093**	-0.106**	-0.107**	-0.106**
	(0.019)	(0.019)	(0.019)	(0.019)
Post2004			0.038**	
			(0.013)	
Tai	0.169**			
	(0.020)			
Constant	3.169**	3.141**	3.146**	3.174**
	(0.024)	(0.023)	(0.029)	(0.107)
Year Fixed Effects	YES	YES		YES
Quadratic Time Trend			YES	
Firm Fixed Effects		YES	YES	YES
Year-industry Fixed Effects				YES
Observations	34991	34991	34991	34991
R-squared	0.012	0.622	0.621	0.622

Note: Robust-clustered standard errors in parentheses. * p < 0.05, ** p < 0.01

Table A5. Robustness check: Falsification test on SO₂ emissions

	(1)	(2)	(3)	(4)
	ln(SO ₂)	ln(SO ₂)	ln(SO ₂)	ln(SO ₂)
	OLS	FE	FE	FE
Tai×Post2004	-0.083	-0.008	-0.007	-0.045
	(0.062)	(0.060)	(0.060)	(0.067)
Post2004			-0.051	
			(0.038)	
Tai	0.289**			
	(0.078)			
Constant	10.343**	10.261**	10.272**	10.258**
	(0.068)	(0.050)	(0.063)	(0.051)
Year Fixed Effects	YES	YES		YES
Quadratic Time Trend			YES	
Firm Fixed Effects		YES	YES	YES
Year-industry Fixed Effects				YES
Observations	9289	9289	9289	9289
R-squared	0.008	0.706	0.705	0.708

Robust-clustered standard errors in parentheses. * p <0.05, ** p <0.01

Table A6. DiD results on SO₂ intensity

	(1)	(2)	(3)	(4)
	ln(SO ₂ int)	ln(SO ₂ int)	ln(SO ₂ int)	ln(SO ₂ int)
	OLS	FE	FE	FE
Tai×Post2004	-0.041	-0.064	-0.063	-0.096
	(0.145)	(0.162)	(0.162)	(0.174)
Post2004			-0.468**	
			(0.097)	
Tai	-0.126			
	(0.126)			
Constant	2.570**	2.587**	2.596**	2.591**
	(0.110)	(0.103)	(0.134)	(0.101)
Year Fixed Effects		YES		YES
Quadratic Time Trend			YES	
Firm Fixed Effects		YES	YES	YES
Year-industry Fixed Effects				YES
Observations	9216	9216	9216	9216
R-squared	0.011	0.508	0.507	0.510

Note: Robust-clustered standard errors in parentheses. * p < 0.05, ** p < 0.01

Table A7. Robustness check: Alternative control group

	(1)	(2)	(3)	(4)
	ln(COD)	ln(COD)	TFP	TFP
	FE	FE	FE	FE
Tai×Post2004	-0.180** (0.058)	-0.171** (0.065)	-0.239** (0.023)	-0.258** (0.023)
Post2004	-0.095* (0.046)		0.231** (0.018)	
Constant	9.773** (0.067)	9.767** (0.055)	5.760** (0.037)	5.762** (0.049)
Year Fixed Effects		YES		YES
Quadratic Time Trend	YES		YES	
Firm Fixed Effects	YES	YES	YES	YES
Year-industry Fixed Effects		YES		YES
Observations	9912	9912	25461	25461
R-squared	0.735	0.737	0.683	0.686

Note: We use TPD firms outside Yangtze Delta region as control group. Robust-clustered standard errors in parentheses. * p < 0.05, ** p < 0.01

Table A8. Robustness check: Diff-in-Diff-in-Diff Results Using Untreated Industries

	(1)	(2)	(3)	(4)
	ln(COD)	ln(COD)	TFP	TFP
	FE	FE	FE	FE
Tai×Post2004×TPD	-0.190**	-0.190**	-0.135**	-0.149**
	(0.055)	(0.055)	(0.021)	(0.021)
Tai×Post2004×Non-TPD	0.232	0.229	-0.006	-0.013
	(0.123)	(0.125)	(0.015)	(0.015)
Post2004×TPD	0.003	0.228**	0.026	0.646**
	(0.039)	(0.070)	(0.014)	(0.032)
Post2004×Non-TPD	-0.001	0.685**	0.063**	1.063**
	(0.052)	(0.188)	(0.008)	(0.042)
Constant	9.133**	9.185**	5.581**	5.636**
	(0.057)	(0.046)	(0.017)	(0.013)
Year Fixed Effects		YES		YES
Quadratic Time Trend	YES		YES	
Firm Fixed Effects	YES	YES	YES	YES
Year-industry Fixed Effects		YES		YES
Observations	16483	16483	129325	129325
R-squared	0.788	0.789	0.734	0.736

Robust-clustered standard errors in parentheses. * p <0.05, ** p <0.01

Table A9. Robustness check: DiD results on COD and TFP using data from 1999 to 2006

	(1)	(2)	(3)	(4)
	ln(COD)	ln(COD)	TFP	TFP
	FE	FE	FE	FE
Tai×Post2004	-0.131*	-0.124*	-0.086**	-0.094**
	(0.056)	(0.060)	(0.021)	(0.021)
Post2004	-0.033		0.158**	
	(0.043)		(0.015)	
Constant	9.727**	9.777**	5.636**	5.556**
	(0.068)	(0.049)	(0.033)	(0.110)
Year Fixed Effects		YES		YES
Quadratic Time Trend	YES		YES	
Firm Fixed Effects	YES	YES	YES	YES
Year-industry Fixed Effects		YES		YES
Observations	10445	10445	29132	29132
R-squared	0.765	0.767	0.723	0.726

Robust-clustered standard errors in parentheses. * p <0.05, ** p <0.01

Table A10. Robustness check: DiD results on COD and TFP using alternative PSM methods

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(COD)	ln(COD)	ln(COD)	TFP	TFP	TFP
	FE	FE	FE	FE	FE	FE
Tai×Post2004	-0.183**	-0.189**	-0.233**	-0.119**	-0.136**	-0.135**
	(0.063)	(0.057)	(0.059)	(0.021)	(0.020)	(0.021)
Constant	9.875**	9.918**	9.937**	5.635**	5.409**	5.433**
	(0.053)	(0.049)	(0.053)	(0.128)	(0.044)	(0.047)
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Firm Fixed Effects	YES	YES	YES	YES	YES	YES
Year-industry Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	9417	12129	9572	28844	35134	29199
R-squared	0.753	0.734	0.739	0.711	0.715	0.717
Neighbor = 5		YES			YES	
Neighbor = 3	YES		YES	YES		YES
ln(Output)	YES				YES	YES
ln(Value added)				YES		
ln(Age)	YES	YES	YES	YES	YES	YES
ln(Water Facility Cost)	YES	YES	YES			
ln(Water Consumption)		YES	YES			
ln(Capital)				YES	YES	YES
ln(Intermediate)				YES	YES	YES

Note: All these models also passed the common trends test. The results are available upon request.

Robust-clustered standard errors in parentheses. * p < 0.05, ** p < 0.01

Table A11. DiD results on TFP with more controls

	(1)	(2)	(3)	(4)
	TFP	TFP	TFP	TFP
	OLS	FE	FE	FE
Tai×Post2004	-0.035	-0.115**	-0.104**	-0.114**
	(0.020)	(0.020)	(0.020)	(0.020)
Post2004			0.131**	
			(0.013)	
Tai	0.120**			
	(0.022)			
ln(Export)	0.051**	0.025**	0.024**	0.025**
	(0.002)	(0.002)	(0.002)	(0.002)
New Products	0.305**	0.050*	0.068**	0.048*
	(0.030)	(0.021)	(0.021)	(0.021)
Constant	2.214**	2.395**	2.443**	2.395**
	(0.073)	(0.053)	(0.067)	(0.053)
Year Fixed Effects	YES	YES		YES
Quadratic Time Trend			YES	
Firm Fixed Effects		YES	YES	YES
Year-industry Fixed Effects				YES
Observations	11850	11850	11850	11850
R-squared	0.017	0.699	0.699	0.700

Robust-clustered standard errors in parentheses. * p <0.05, ** p <0.01

Table A12. Robustness check: DiD results on COD and TFP controlling FYP targets

	(1)	(2)	(3)	(4)
	ln(COD)	ln(COD)	TFP	TFP
	FE	FE	FE	FE
Tai×Post2004	-0.201** (0.054)	-0.182** (0.058)	-0.130** (0.020)	-0.110** (0.020)
Post2004	-0.018 (0.038)		0.150** (0.013)	
FYP targets	-0.361 (0.331)	-1.512 (0.966)	0.149 (0.100)	-1.656** (0.305)
Constant	9.760** (0.065)	9.783** (0.049)	5.685** (0.031)	5.615** (0.129)
Year Fixed Effects		YES		YES
Quadratic Time Trend	YES		YES	
Firm Fixed Effects	YES	YES	YES	YES
Year-industry Fixed Effects		YES		YES
Observations	11951	11951	34991	34991
R-squared	0.748	0.750	0.708	0.712

Robust-clustered standard errors in parentheses. * p < 0.05, ** p < 0.01

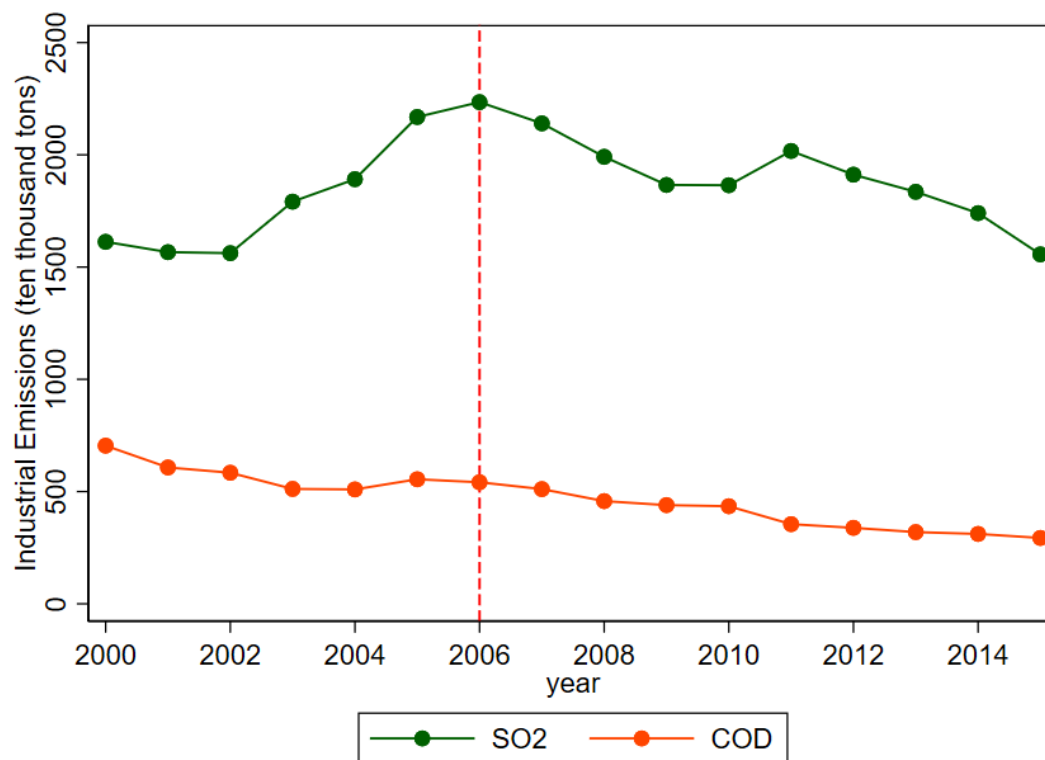


Figure A1. Industrial emissions from 2000 to 2015.

Note: The industrial emission refers to total industrial COD emission including all industries, not just TPD industry.

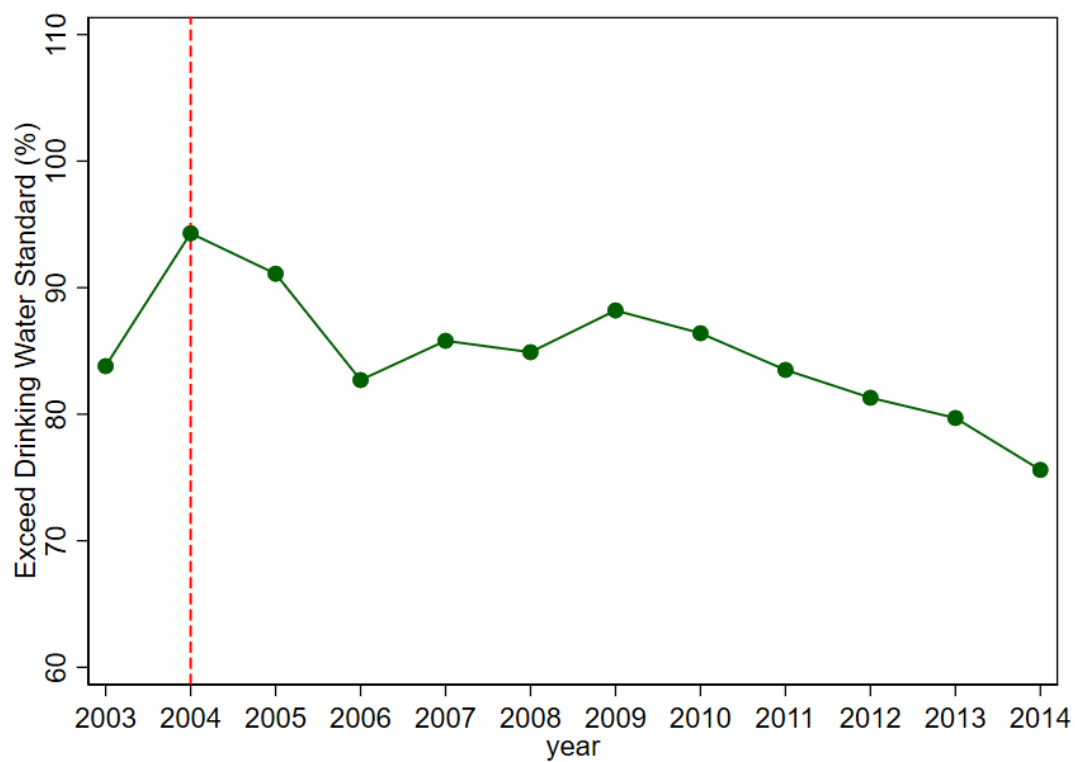


Figure A2. Exceedances of drinking water standards of Lake Tai.

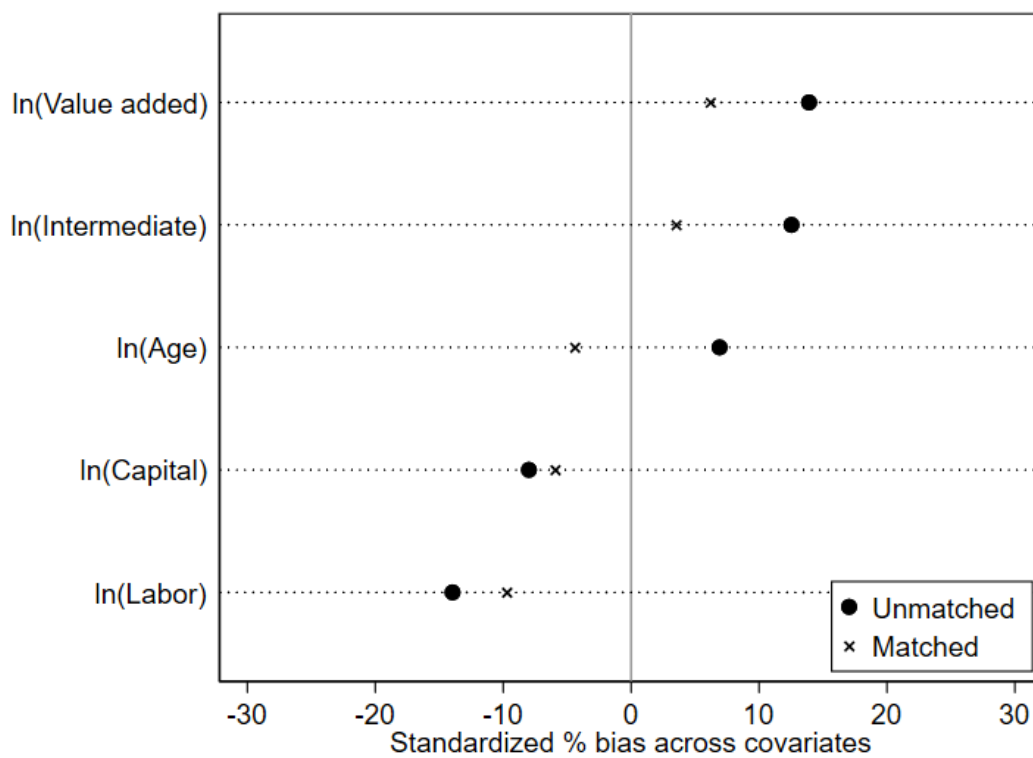


Figure A3. Standardized bias before and after the PSM, 1999-2004.



Figure A4. Lake Tai and Yangtze Delta region.

Note: Lake Tai, Jiangsu region (the overlap of Jiangsu province and Lake Tai region) is the area where the new policy is implemented. In our baseline models, we use all TPD firms outside Jiangsu province to select our control group using a PSM model. As a robustness check, we also exclude all firms in the Yangtze Delta region before implementing our PSM model, to eliminate the possibility of spillover effects.

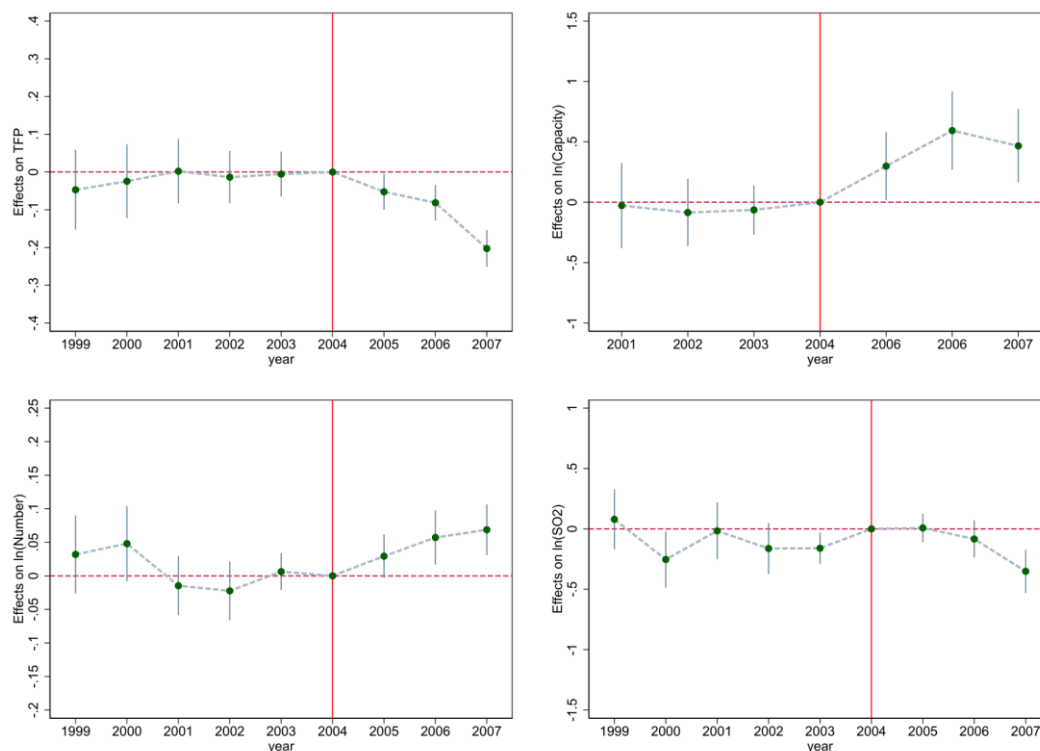


Figure A5. Trends of firms' TFP-OP, facility number, facility capacity, and SO₂ emissions over time.

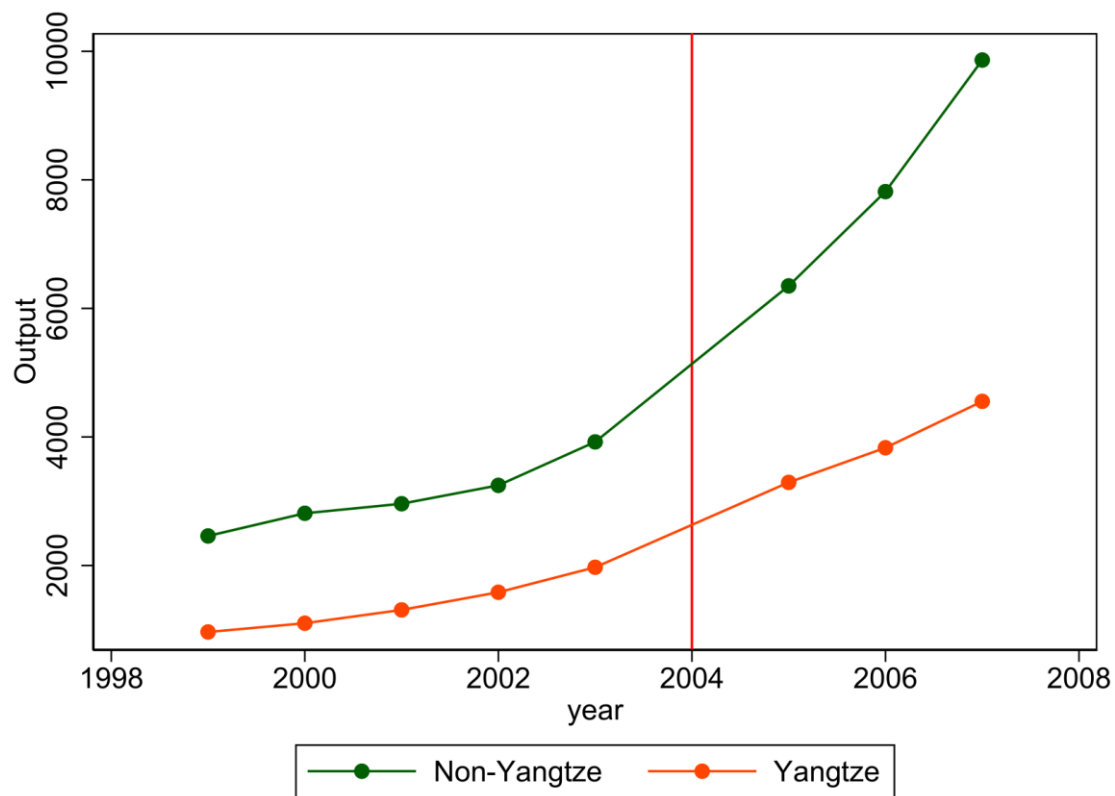


Figure A6. Trends of total output values within and outside Yangtze Delta.