

Difference-in-Differences: An Example from Risk Targeting and Policy Illusions Paper

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What is the Volcker Rule

The Volcker Rule is mandated as one of the core elements in the larger financial reform legislation of the Dodd-Frank Act that was signed into law on July 21, 2010.

The Volcker Rule prohibits banks from engaging in certain non-banking activities such as proprietary trading or hedge fund and private equity investing.

Who is affected

- Those bank holding companies (BHCs) that have traditionally had their business models geared toward activities now banned or limited by the Volcker Rule (institutions with large trading books) are affected most and should hence show the strongest reactions.
- In the paper, we define *Affected BHC* as one if the average trading asset ratio during the pre-DFA period (Q3 2004 - Q2 2009) was equal to or larger than 3%, and zero otherwise.

Define post-DFA dummy

- We identify the periods before and after the passing of the Volcker Rule as part of the Dodd-Frank Act.
- *after DFA* = 1 for all 20 quarters between the third quarter of 2010 (when the Dodd-Frank Act was passed) and the second quarter of 2015.
- *after DFA* = 0 for the 20 quarters preceding the treatment, i.e., from the third quarter of 2004 to the second quarter of 2009 (when the Obama Administration first announced major reform proposals for the financial sector).

Difference-in-Differences fixed effect model

$$Y_{i,t} = \alpha + \beta * (\text{after DFA}_t * \text{Affected BHC}_i) + \gamma_i + \delta_t + X_{i,t} + \varepsilon_{i,t} \quad (1)$$

- β is the coefficient of interest measuring the announcement effect of the Volcker Rule.
- γ_i and δ_t are bank holding company fixed effect and time fixed effect respectively, which are used to control for influences constant either over time or across BHCs.
- $X_{i,t}$ include control variables to test for additional covariates that might vary over both time and bank and that might influence banks' business models.

Propensity score matching

- Use data on the first quarter.
- For each bank forecast using logistic regression: dependent variable is *Affected BHC*, independent variables are the control variables.
- For each treated bank, select 3 control banks with closest propensity score.
- If one control bank is selected multiply times, they have a higher weight.

Table: Before matching

Table: Statistics in Q3 2004 before matching

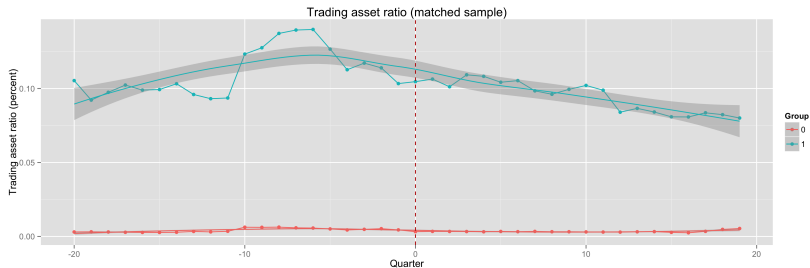
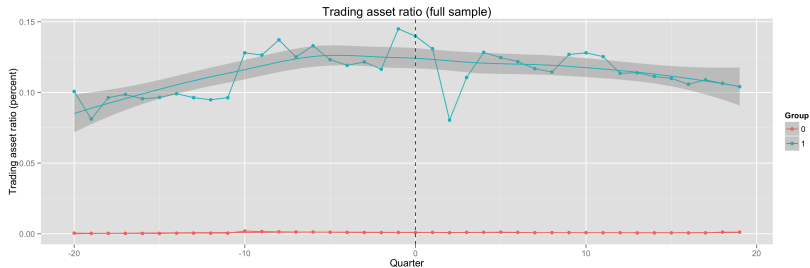
	Control group		Treat group		Diff
	Mean	SD	Mean	SD	
dep_lnassets	13.12	1.248	17.77	2.846	-4.649*** (0.310)
dep_leverage	0.0937	0.0345	0.0825	0.0187	0.0113 (0.00817)
dep_roa1	0.00294	0.00304	0.00309	0.00143	-0.000154 (0.000719)
dep_liquidity	0.0397	0.0283	0.0477	0.0363	-0.00806 (0.00680)
dep_depositratio	0.667	0.105	0.346	0.221	0.321*** (0.0259)
dep_loans_reratio	0.699	0.149	0.510	0.225	0.190*** (0.0360)
dep_cir	0.506	0.151	0.470	0.0880	0.0354 (0.0358)

Table: After matching

Table: Statistics in Q3 2004 after matching

	Control group		Treat group		Diff
	Mean	SD	Mean	SD	
dep_l_nassets	15.65	1.967	17.77	2.846	-2.124*** (0.602)
dep_leverage	0.0829	0.0237	0.0825	0.0187	0.000460 (0.00614)
dep_roa1	0.00319	0.00186	0.00309	0.00143	0.0000996 (0.000480)
dep_liquidity	0.0406	0.0354	0.0477	0.0363	-0.00707 (0.00969)
dep_depositratio	0.505	0.154	0.346	0.221	0.159** (0.0469)
dep_loans_reratio	0.603	0.197	0.510	0.225	0.0930 (0.0556)
dep_cir	0.478	0.119	0.470	0.0880	0.00740 (0.0306)

Plot: DiD full sample & matched sample



DiD Fixed Effects Regression Results

Table: DiD FE Models

	Full Sample	Matched Sample
$1_{affected\ BHC} \times 1_{after\ DFA}$	-0.02338*** (0.00053)	-0.02858*** (0.00209)
Constant	YES	YES
Controls	YES	YES
Fixed Effects	YES	YES
Observations	40026	1668
R-squared	0.053	0.186



Jussi Keppo & Josef Korte (2018)

Risk Targeting and Policy Illusions - Evidence from the Announcement of the Volcker Rule

Management Science, 64, pp. 215-234.