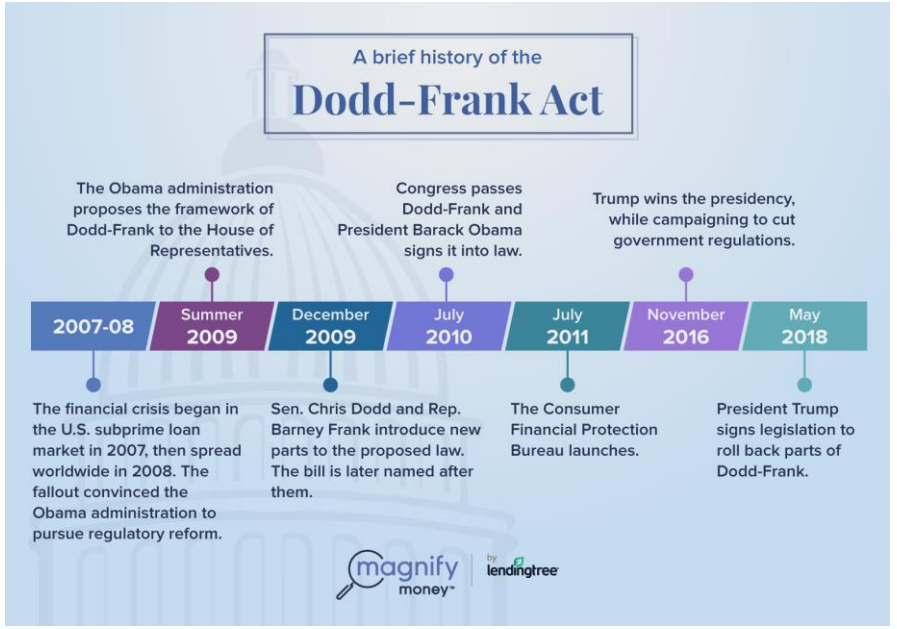
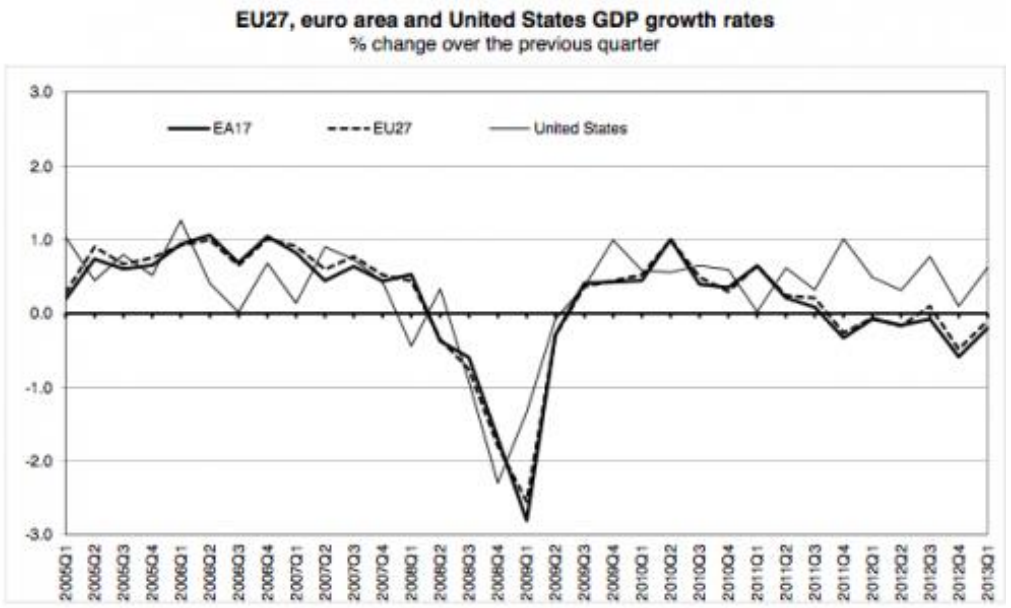
Was the Dodd–Frank Wall Street Reform and Consumer Protection Act effective in reducing loan charge-offs for mid-sized banks?

By Nikola Mitrovic

Background

- 2007 Subprime Crisis and 2008 Financial Crisis both decimate the American economy
- Dodd-Frank Act is enacted with hopes of minimizing the chance of a recession like that occurring again
- How effective is Dodd-Frank really?
- How effective was it at reducing bank charge-offs?





Literature Review

- “The Relevance of Size in Predicting Bank Failures” by Alzugaiby et al
- “A Primer on the Evolution and Complexity of Bank Regulatory Capital Standards” by Barth and Miller
- “Forecasting Net Charge-Off Rates of Banks: A PLS Approach” by Barth
- “Risk Assessment for Banking Systems” by Elsinger et al
- “BankCaR (Bank Capital-at-Risk): A Credit Risk Model for US Commercial Bank Charge-Offs” by Frye and Pelz
- “Too Big to Fail” by Riles
- “Regression-Discontinuity Analysis: An Alternative to the Ex Post Facto Experiment” by Thistlewaite and Campbell

Data

- Data collected entirely from Federal Reserve
- 15 variables of annual bank data ranging from 2007 to 2017 for banks with total assets greater than $5B and less than $15B
- Variables include charge-offs and total assets
- Dummy variables created

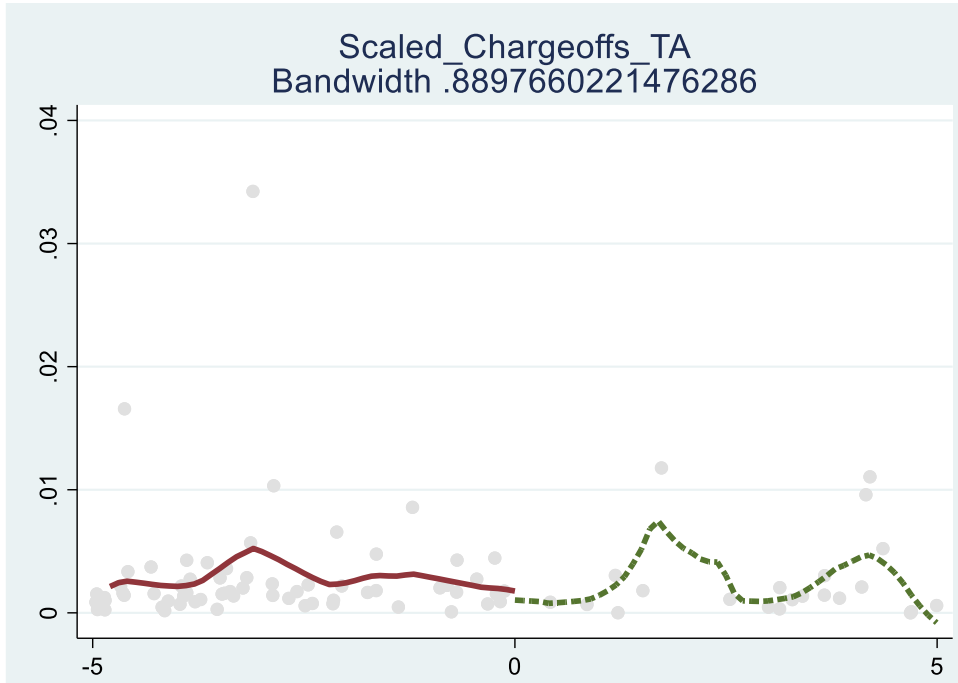
Method 1 – Regression Discontinuity Model

- First applied by Donald Thistlewaite and Donald Campbell
- Commonly used in situations when a treatment or policy is applied to observations beyond a threshold value of an independent, or so-called running variable
- Threshold for our study is $10B in Total Assets
- Model ran four times, each time with a different bandwidth

$$Y = \alpha + \beta_1 x_i + \beta_2 c_i + \beta_3 c_i^2 + \beta_4 c_i^3 + \epsilon,$$

where

$$x_i = \begin{cases} 1 \text{ if } c_i \geq \bar{c} \\ 0 \text{ if } c_i < \bar{c} \end{cases}$$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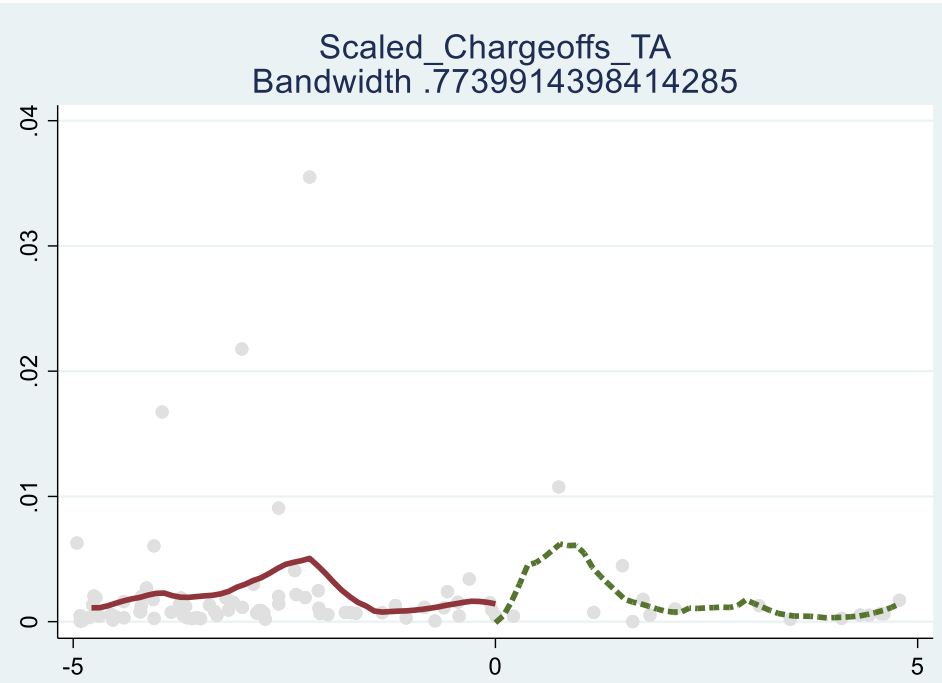
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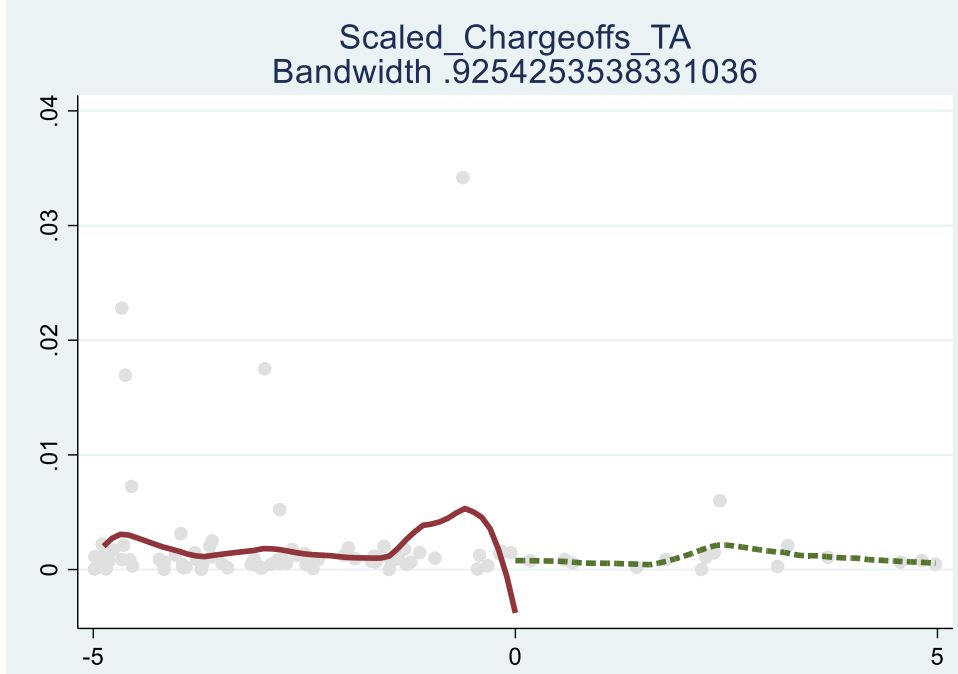
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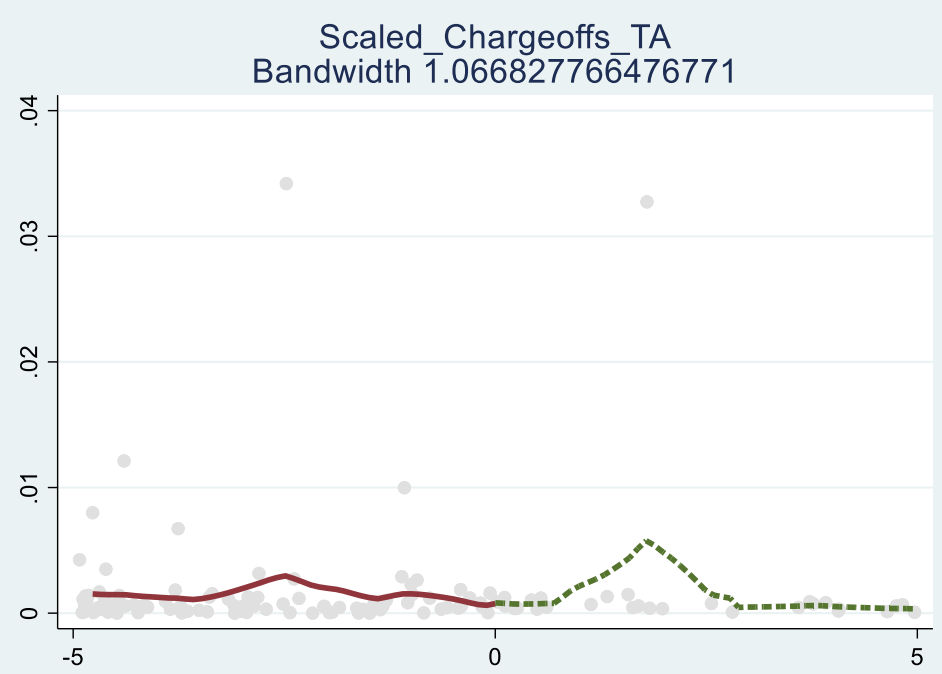
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Method 2 – Multivariable Linear Regression

$$Y = \alpha_0 + \alpha_1 \times X_1 + \alpha_2 \times X_2 + \ldots + \alpha_6 \times X_6 + \beta_0 \times d + \beta_1 \times (d \times X_1) + \beta_2 \times (d \times X_2) + \ldots + \beta_6 \times (d \times X_6) + \varepsilon$$

- Low R-square statistics in the RDD models prompted me to construct another model: a multivariable regression model
- Goal was to use dummy variables to test whether estimated regression coefficients for the banks subject to the Dodd-Frank regulation were significantly greater than the estimated regression coefficients of A) the small banks in the Dodd-Frank Act period (not subject to regulation), and B) the large banks in the period preceding the Dodd-Frank Act implementation.

Multivariable Results

	Estimate	T statistic	P-value
Intercept	0.000413	1.46	0.1438
Loans and Leases ($M)	-0.00034	-5.75	<.0001
Net Interest Income ($M)	0.011072	8.19	<.0001
Loan Loss Provision ($M)	0.078395	20.16	<.0001
NP Loans Total ($M)	0.000473	2.77	0.0058
Credit Cards ($M)	0.00107	7.23	<.0001
Residential Real Estate ($M)	0.000219	4.3	<.0001
Intercept Dummy	0.00101	2.05	0.0409
Net Interest Income Slope Dummy ($M)	-0.00442	-2.12	0.0343
Credit Cards Slope Dummy ($M)	-0.00111	-4.64	<.0001

Delta_A = 0.00101 + (-0.00442) x Net Interest Income + (-0.00111) x Credit Cards

Multivariable Results

Variable (Units of measurement)	Parameter Estimate	t Value	Pr > |t|
Intercept	-0.00195	-3.78	0.0002
Cash ($M)	0.001208	4.66	<.0001
Loan Loss Provision ($M)	0.060198	29.42	<.0001
Net Income ($M)	0.004304	2.91	0.0039
NP Loans Total ($M)	0.001358	4.8	<.0001
Credit Cards ($M)	0.000659	6.91	<.0001
Commercial Real Estate ($M)	0.000477	3.53	0.0005
Intercept Dummy	0.00224	3.17	0.0017
Cash Slope Dummy ($M)	-0.00104	-2.17	0.0306
Loan Loss Provision Slope Dummy ($M)	0.015193	2.88	0.0043
NP Loans Total Slope Dummy ($M)	-0.00097	-2.06	0.0402
Commercial Real Estate Slope Dummy ($M)	-0.00055	-3.01	0.0029

Delta_B = 0.00224+ (-0.00104) x Cash +(0.015193) x Loan Loss Provision + (-0.00097) x NP Loans + (-0.00055) x Commercial Real Estate

Conclusion

- Both models tell us that Dodd-Frank was not effective in reducing bank charge-offs…
- For future research, I recommend:
  - Using different bandwidths in the RDD model
  - Using different threshold ($50B) in RDD model
  - Using different variables in Multivariable model