Deregulation and the $10 Billion Threshold: Bank Behavior, M&A Activity, and Market Reactions Post-EGRRCPA

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A Thesis in The Department of Finance

Presented in Partial Fulfillment of the Requirements

for the Degree of Master of Science (Finance) at

John Molson School of Business

Concordia University

Montreal, Quebec, Canada

June 2025

CONCORDIA UNIVERSITY
School of Graduate Studies

This is to certify that the thesis prepared

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Entitled: Deregulation and the $10 Billion Threshold: Bank Behavior, M&A Activity, and Market Reactions Post-EGRRCPA

and submitted in partial fulfillment of the requirements for the degree of

Master of Science (Finance)

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

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This thesis examines how the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) affected U.S. banks near the $10 billion asset threshold. Using data from 2014–2023, the study applies event studies, Wilcoxon tests, difference-in-differences regressions, and survival analysis to assess bank responses. Results show that banks just below the threshold (*"Indirectly Treated"*) reacted more strongly, with significant positive stock market responses and accelerated asset and equity growth post-deregulation. These banks also increased capital buffers and reduced leverage. Many crossed the $10 billion threshold through mergers and acquisitions (M&A), suggesting a strategic shift enabled by the rollback of Dodd-Frank provisions. The findings demonstrate that deregulation spurred growth and consolidation, particularly among smaller banks, highlighting how rigid regulatory thresholds can distort bank behaviour. The study contributes to the literature by documenting the real effects of deregulatory policy on financial institutions' strategies and market performance.

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List of Variables

Variables	Formula	Description
Return on Assets (ROA)	`ni / at`	Measures bank's profitability relative to assets.
Return on Equity (ROE)	`ni / ceq`	Measures bank's profitability relative to equity.
Net Interest Income to Assets	`niint / at`	Measures how well a bank uses assets to generate net interest income.
Leverage Ratio	`at / ceq`	Ratio of assets to common equity, indicating leverage.
Equity to Assets Ratio	`ceq / at`	Proportion of equity in total assets.
Tier 1 Capital Ratio	`capr1`	Regulatory Tier 1 capital ratio (if %).
Total Capital Ratio	`capr3`	Regulatory total capital ratio (if %).
Tangible Equity to Total Assets	`ceqt / at`	Ratio of tangible equity to total assets.
Loan Loss Provision to Assets	`pclc / at`	Measures loan loss provision relative to assets.
Allowance for Loan Losses to Assets	`pll / at`	Measures allowance for loan losses relative to assets.
Provisions to Net Income	`pclc / ni`	Loan loss provisions relative to net income.
Deposits to Assets Ratio	`dptc / at`	Deposits as a % of total assets.
Liabilities to Equity Ratio	`lt / ceq`	Total liabilities as % of common equity.
Capital to Deposits Ratio	`ceq / dptc`	Common equity relative to deposits.
Interest Dependence Ratio	`ebit / niint`	Measures earning efficiency relative to net interest income.
Diversification of Non-Interest Income	`tnii / (tnii + niint)`	Proportion of income from non-interest sources.
Net Interest Income as % of Total	`niint / (tnii + niint)`	Net interest income relative to total income.
Deposits to Equity Ratio	`dptc / ceq`	Deposits relative to common equity.
Deposits to Tangible Equity Ratio	`dptc / ceqt`	Deposits relative to tangible equity.
Total Liabilities to Assets Ratio	`lt / at`	Funding liabilities as % of total assets.
Asset Growth (YoY %)	`diff(at) / lag(at)`	Year-over-year growth of assets.
Equity Growth (YoY %)	`diff(ceq) / lag(ceq)`	Year-over-year growth of common equity.
Deposit Growth (YoY %)	`diff(dptc) / lag(dptc)`	Year-over-year growth of deposits.

List of Acronyms

Acronym	Full Meaning
EGRRCPA	Economic Growth, Regulatory Relief, and Consumer Protection Act
capr1	Tier 1 Risk-adjusted Capital Ratio
capr3	Total Risk-adjusted Capital Ratio
ROA	Return on Assets
ROE	Return on Equity
ceqt	Common Equity Tangible
ceq	Ordinary Equity Total
dptc	Deposits Total
lcat	Loans / Claims / Advances
seq	Shareholder's Equity
pclc	Provision for Loan Losses
pll	Provision for Loan / Asset Losses
ni	Net Income (Loss)
at	Assets
tnii	Total Non-Interest Income
niint	Net Interest Income
onii	Other Non-Interest Income
ebit	Earnings Before Interest and Taxes

Introduction

This paper examines the deregulation effects of the EGRRCPA on banks near the 10 billion USD threshold. We investigate it for banks below and above the threshold. This paper uses the grouping methodology of Bindal et al. (2020) and Bouwman et al. (2018) to create three distinct groups. We start looking at market reactions to the deregulation process with an Event Study and then break down how the act's passage affects banks' profitability, asset growth and capital structure. Our study is the first one that investigates the deregulation's impact on banks that crossed the threshold after the deregulation. We also look into how Mergers and Acquisitions play a role in helping the below-threshold banks reach their goal.

Literature Review

This paper builds on the critical work of two key papers. Bindal et al. (2020) investigate how the Dodd-Frank Act's regulatory size thresholds impact bank behaviour, particularly their Mergers and Acquisition behaviour. The paper argues that banks just below a regulatory threshold should be classified as Indirectly Treated, as these banks will adjust their behaviour due to regulatory changes. In their paper, when working on the Dodd-Frank Act's 10 billion USD threshold, the authors classify the banks as Untreated if they are below 7 billion USD in assets and above 4 billion USD. They classify just below threshold banks with assets of 7 billion and more and under 10 billion dollars, and Treated, when assets between 10 and 13 billion dollars. This classification is important to this paper as it replicates the classifications based on the same criteria. The authors in their paper show that previous regulatory studies, which took a difference-in-difference approach between only above-threshold and below-threshold banks, are incomplete. They recommended a new approach where difference-in-difference studies consider Indirectly Treated, Treated and Untreated banks. This approach allows researchers to capture the indirect effect of regulatory changes on banks who are very close to the threshold. In their paper, the authors find clear evidence that the Dodd-Frank Act caused banks just below the threshold to adjust their M&A strategies in a way to either avoid crossing the threshold or to grow large enough where they can absorb the cost of regulations better. The authors studied both the 10 and 50 billion dollar thresholds.

Bouwman et al. (2018) utilize the same grouping methodology. The authors first conduct an event study around the Dodd-Frank size-based regulations and find significant negative abnormal

returns for Treated banks around the signing of the Dodd-Frank Act, showing that investors price in the extra cost of regulation for these banks. The authors then conduct tests to investigate asset growth and loan growth of the groups of banks and find proof that Indirectly Treated banks, the banks just below the threshold, grow their assets more slowly compared to Untreated banks. This proves that Indirectly Treated banks slow down their growth to avoid crossing the threshold and incurring increased regulatory costs. In their loan pricing segment, the authors find that Indirectly Treated banks have significantly higher loan spreads than Untreated banks in the post-Dodd-Frank period.

This paper builds on the works of these two papers and investigates how Indirectly Treated and Untreated banks are affected by the partial repeal of the Dodd-Frank Act in the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA).

This is not the first paper to look into the effects of deregulation. Erkens and Gan (2022) investigate the investors' and banks' responses to the deregulation impacts of EGRRCPA. They conducted a long-tailed event study on the deregulation process and find that positive abnormal returns for smaller banks are higher than larger banks. The authors also conduct studies on changes in bank growth, profitability, capital structure and lending behaviours after deregulation. The authors however do not follow the Bindal et al. and Bouwman et al. just below threshold grouping methodology and use the traditional below-threshold and above-threshold classifications for banks. Their paper also does not focus on changes in banks that crossed the threshold after deregulation, nor do they investigate the M&A impact post-deregulation.

Even though the three above-mentioned papers are the most important papers for the current study, our work follows a long line of regulatory impact literature. Barth et al. (2002) investigate how bank regulations affect the development and stability of the banking sector. Their paper investigates a wide array of regulations that include the restriction of banking activities to pure banking roles, regulations that restrict entry of foreign banks, deposit insurance, private sector monitoring, state ownership of banks, loan classifications and regulations that encourage private sector monitoring. They find that diversification still remains relevant to a firm's stability and profitability, and banks are not exempt from this. Restricting banks from engaging in non-bank financial activities harms their development and stability. They also find no evidence that this type of regulation leads to an increase in bad loans. They find no proof that capital restriction regulations improve bank development or even prevent the likelihood of bank crises. They do not find any positive banking sector outcome for higher amounts of deposit insurance. They find that the only regulations that lead to a positive development of the banking sector are the ones that lead to greater transparency of information, which allows superior private sector monitoring.

Barth et al. (2004) conduct an international study on the impacts of multiple regulators on banks in developed, developing and transitional economies. Their research shows that in economies with

multiple regulators, the competition between the regulators allows banks to seek out the blessings of more 'forgiving' regulators, and this lets the banks get away with lower capital ratios and endure higher liquidity ratios. Their paper also investigates economies where the central bank acts in a supervisory capacity, and they find that in those economies, banks have higher non-performing loans. They support the theory that strong supervision leads to better lending. They study over 2500 corporations across multiple nations and investigate the problems they face when they seek bank financing. They find no empirical proof that strong direct bank supervision leads to better corporate lending. According to this study, in nations where national and legal institutions are weak and unfair, strong supervision increases the chances of corruption and more mismanaged banking activities. This paper finds great empirical support for greater private monitoring. This must be noted that this finding does not mean that they contend that bank supervision is ineffective. Instead, they recommend strong supervisory actions that lead to greater transparent and cohesive information being released to the wider market and that leads to superior private sector scrutiny of bank lending practices, which leads to improvement in the lending activities of the banks and, in turn, greater bank development.

Srivastav and Vallascas (2019) investigate the implications of decreased regulatory policy on Bank Holding Companies (BHCs). While prior common knowledge suggested that a reduction in regulation for small banks would lead to greater economic benefit, their paper empirically proves that. They study the impact of a policy that allowed for a greater capital ceiling for small banks. Their study finds that BHCs that become newly classified as small banks increase their lending to small and medium-sized enterprises, and this leads to a significant boost in the economic output of the local counties and states those banks belong to. Tanna et al. (2009) investigate the impact of regulations on commercial banks by running a series of statistical efficiency tests. Their study focuses on the regulatory parts of Basel II on banks during 2000–2004. They find empirical proof of the impacts of market discipline, official supervisory power and capital requirements on the cost and profit efficiencies of banks. They find that cost and profit efficiencies don't always correlate and supervisory power leads to better cost and profit efficiency. Capital requirements, however, lead to lower profit efficiency even if they make banks more cost-efficient.

This paper's event study also follows a long line of event studies on regulatory changes. Lamdin (2001) summarizes the past literature on event studies conducted around regulatory changes. The author dissects multiple papers and investigates the unique methodologies used to come to the conclusions in the various studies. The author states that the increased usage of event studies should be treated with caution, as event studies on regulatory changes are difficult to conduct and, therefore, people will always question the results. His study investigates how researchers can change their methodology based on the circumstances of the regulatory changes being considered. One of the early applications of event studies to regulatory changes is by Blackeners and Northcutt (1997),

who examine the impact of the Superfund Amendments and Reauthorization Act (SARA) of 1986 on chemical firms. Their study finds that firms with greater exposure to government-mandated cleanup costs experience significant negative stock price reactions, while firms that are more transparent and proactive in disclosing information have less negative market responses. Similarly, Chen and Sanger (1987) study the effects of the partial deregulation of the natural gas industry and find that the policy change led to increased systematic risk for firms in the sector. Black and Khanna (2007) investigate the impact of corporate governance reforms on firm values and hypothesize that large firms would experience more positive market reactions compared to smaller firms, which may struggle to comply with regulatory minimum standards. Their event study confirmed that governance reforms have differential effects based on firm size. The methodological evolution of event studies has also been a topic of interest. Binder (1998) traces the development of the event study approach, starting with the seminal work of Fama, Fisher, Jensen, and Roll (FFJR) (1969). The author discusses the statistical robustness of different abnormal return calculation methods and the emergence of cross-sectional regression techniques.

Ovtchinnikov (2013) finds that deregulation leads to a wave of mergers and acquisitions. The paper states that for industries that have strong regulatory protections, deregulation leads to increased M&A for underperforming firms, so that they can consolidate and respond better to newer competitive forces. Noam (1993) shows how deregulation and the breakup of AT&T leads to increased M&A activity in the telecommunication sector. Campello and Matta (2019) find that deregulation leads to significant changes in capital structures and liquidity strategies for firms in anticipation of strategic M&A.

Literature Gap

In Bouwman et al. (2018) and Bindal et al. (2020), the authors divide banks into directly Treated, Indirectly Treated and Treated banks to study the effects of Dodd-Frank Act on Banks and conduct event studies and study M&A pattern changes. Erkens and Gan (2022) also conduct event studies on the effect of the EGRRCPA on banks. My study differs from Bindal et al. (2020) and Bouwman et al. (2018), by focusing on the EGRRCPA. It differs from Erkens and Gan, first by repeating the group classification on the EGRRCPA and secondly by focusing on the Crossers, banks who crossed the threshold, and by exploring M&A effects.

Research Design and Empirical Specification

This paper consists of four main sections. Section 1 is the event study that investigates how the groups of banks are affected by key policy indicators leading up to the passage of the EGRRCPA.

Cumulative returns are calculated based on the formula:

Cumulative Abnormal Returns

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t})$$

Where:

- $AR_{i,t}$: Abnormal return for bank i on day t.
- $R_{i,t}$: Actual return of bank i on day t.
- α_i: Estimated intercept from the OLS regression of bank i's returns on market returns during the estimation window.
- β_i: Estimated market beta for bank i, capturing the sensitivity of the bank's return to market return fluctuations.
- $R_{m,t}$: Market return on day t (CRSP value-weighted market return, VWRETD).

One-way t-tests and Patell Z are used to check the significance of the abnormal returns. The event study aims to capture not only the market reaction of the banks but also how different the reactions are for each group.

In Section 2, the paper dives deeper into the three groups. The nonparametric Wilcoxon test is used to investigate the changes in fundamental metrics for each group before and after the deregulation. The Wilcoxon test is also used to compare differences between groups after deregulation. A Difference-in-Difference regression is used to capture the impact of EGRRCPA on the bank groups.

Wilcoxon Rank-Sum Test Formula

$$W = \sum R_i$$

Where:

- W: Wilcoxon rank-sum test statistic.
- R_i: Rank of the i-th observation in the combined sample.

Null Hypothesis ($\mathbf{H_0}$): The distribution of the variable is the same for Treated and Indirectly Treated banks.

$$H_0 : \text{Distribution}_{\text{Group X}} = \text{Distribution}_{\text{Group Y}}$$

Alternative Hypothesis (H_1): The distributions are different.

$$H_1 : \text{Distribution}_{\text{Group X}} \neq \text{Distribution}_{\text{Group Y}}$$

Variables Tested: ROA, ROE, NIM, Leverage Ratio, Equity to Assets, Tier 1 Capital Ratio, Total Capital Ratio, Tangible Equity to Total Assets, Loan Loss Provision to Assets, Allowance for Loan Losses to Assets, Funding Liabilities to Assets, Deposits to Assets, Liabilities to Equity, Capital to Deposits, Interest Dependence ratio, Provisions to Net Income, Asset Growth, Equity Growth, Deposit Growth, Net Interest Income to Operating Income, Diversification of Non-Interest Income.

Difference-in-Difference Regression Formula

$$Y_{it} = \beta_0 + \beta_1 \text{Group}_i + \beta_2 \text{Post}_t + \beta_3 (\text{Group}_i \times \text{Post}_t) + \varepsilon_{it}$$

Where:

- Y_{it}: Financial ratio (e.g., ROA, ROE, etc.) for bank i in year t.
- Group_i: Dummy variable (1 if Indirectly Treated bank, 0 if Untreated).
- Post_t: Dummy variable (1 if post-deregulation (2017+), 0 if pre-deregulation).
- β_3: DiD coefficient measuring the differential impact.

In Section 3, the paper focuses on Crossers—banks from below-threshold groups (Indirectly Treated and Untreated) who crossed the 10 billion dollar threshold after deregulation. Crossers and Non-Crossers are compared to assess EGRRCPA's effect.

In Section 4, the paper examines mergers and acquisitions. It evaluates which below-threshold group (Indirectly Treated or Untreated) is more likely to undergo M&A and how M&A affects crossing the threshold. A Poisson regression model is used to assess this impact. To check how the passage of EGRRCPA impacted bank M&A, the Poisson regression model is used

Poisson Regression

$$\begin{aligned}\log(\mathbb{E}[\text{Nr\_Acq}]) = \beta_0 &+ \beta_1 \cdot \text{PostEGRRCPA} + \beta_2 \cdot \text{COVID\_Dummy} \\ &+ \beta_3 \cdot \text{Group} + \beta_4 (\text{PostEGRRCPA} \times \text{Group}) + \ldots\end{aligned}$$

Where:

- $\mathbb{E}[\text{Nr\_Acq}]$: The expected number of M&A acquisitions for a bank.

- β_0: Intercept (baseline log count of M&As for Untreated banks pre-EGRRCPA and pre-COVID).
- β_1 (PostEGRRCPA): Change in log of expected acquisitions after deregulation.
- β_2 (COVID_Dummy): Effect of the COVID period (2020–2021) on M&A activity.
- β_3 (Group): Difference between Indirectly Treated and Untreated banks.
- β_4 (PostEGRRCPA $\times$ Group): Interaction capturing deregulation's impact on Indirectly Treated banks.
- β_5 (COVID_Dummy $\times$ Group): Interaction capturing COVID's impact on Indirectly Treated banks.
- β_6 (Log_Assets): Effect of bank size (log of total assets).
- β_7 (Log_Assets^2): Nonlinear size effect on M&A activity.
- β_8 (control variable): Impact of profitability on M&A likelihood.

Logistic Regression

$$\log\left(\frac{P(\text{Acq\_Dummy}=1)}{1-P(\text{Acq\_Dummy}=1)}\right) = \beta_0 + \beta_1 \cdot \text{at} + \beta_2 \cdot \text{Leverage\_Ratio} + \beta_3 \cdot \text{Total\_Capital\_Ratio} + \beta_4 \cdot \text{Deposit\_Growth} + \ldots$$

Where:

- $P(\text{Acq\_Dummy}=1)$: Probability that a bank engages in M&A.
- β_0: Intercept.
- β_1 to β_8: Estimated coefficients.

Independent variables:

- Leverage Ratio: Financial leverage.
- Total Capital Ratio: Capital adequacy.
- Deposit Growth: Change in deposit base.

- Asset Growth: Change in asset size.
- Indirectly Treated Dummy: 1 = Indirectly Treated bank, 0 = Untreated.
- COVID Dummy: 1 = 2020–2021, 0 = otherwise.
- Group_2016_COVID_Interaction: Interaction between group status and COVID period.

Kaplan-Meier Survival Analysis

Finally, a Kaplan-Meier survival analysis is conducted to evaluate whether banks that engage in M&As cross the $10 billion threshold faster than those that do not. The survival curves help visualize and statistically compare the time to threshold-crossing for acquiring versus non-acquiring banks.

Data

The analysis requires stock market data from the Center for Research in Security Prices (CRSP) and financial statement data from Compustat Banking Fundamentals. As this paper focuses on the effects of regulatory changes, the New York Federal Reserve linking table is used to obtain the RSSID of bank holding companies and commercial banks.

Following Bouwman (2018), we manually exclude all banks that are not described as commercial banks or bank holding companies. After filtering the RSSID table, the PERMCOs are matched with those in CRSP. Secondary name matching is also used to ensure the highest number of valid matches. The NCUSIP from the RSSID-CRSP linking table is matched to the CUSIP from Compustat to create the final RSSID-CRSP-Compustat linking table. Secondary matching using names and tickers is also conducted to finalize the sample. The matching process follows the principles of the CRSP–Compustat Merged Database Guide.

The unique identifiers PERMCO and GVKEY are used to download data from CRSP and Compustat respectively.

Merger and acquisition data is downloaded from Thomson Reuters Refinitiv. Initially, all data from January 2014 to 2025 is extracted. Acquirers that are not classified under financial industries are excluded manually. Then, all acquirers that are not commercial banks or bank holding companies are removed using detailed industry codes. Only completed deals where both acquirer and target are U.S.-based are retained. Deals where the acquirer did not acquire at least 50% ownership are excluded. Finally, additional manual checks remove credit unions or thrift banks, ensuring

the final list includes only commercial banks and bank holding companies. These deals are then mapped to our main linking table.

Event study dates are selected from a combination of news journals and congressional reports.

Bank Grouping

Figure 1: Bank Groupings

Group	Number of Banks
Excluded	235
Indirectly Treated	30
Large Banks	50
Treated	12
Untreated	45

This paper follows the methodology of Bindal (2017) and Bouwman (2018) and creates three key groupings based on asset size. 2016 asset sizes are used to group the banks. Fiscal year 2016 is chosen as the classification date as this is the year the earliest signalling of the deregulation starts. The banks are put into the Treated group when they have assets between 10 billion USD and 15 billion USD. These are the banks that will be immediately affected by changes in the ERCGPPA that affect banks at 10 billion. In the Bindal and Bouwman papers, the Treated banks are between 10 and 13 billion USD. A marginal increased upper limit is used as it doubles the sample of Treated banks from 6 to 12. The Banks with assets below 10 billion and more than 7 billion are the Indirectly Treated banks. These are the banks that are almost on the threshold of crossing over to 10 billion and being affected by the regulatory changes. This is the key group this paper is studying. The banks with assets less than 7 billion USD and more than 4 billion USD are in the Untreated group. This group of banks have assets which are theoretically too low for them to be worried about the 10 billion threshold changes, as they are less likely to cross the limit quickly enough for changes to be observed in their behaviour in relation to the ERCGPPA. Following Bindal et al. and Bouwman et al. papers, all banks below 4 billion USD are excluded. This is because their assets are too low to be affected by any changes in the 10 billion threshold. Additionally, this paper explicitly excludes all community banks and includes only commercial banks and Bank holding companies. Excluding banks with assets below 4 billion helps us further filter out any community banks, whose results can skew our study. All banks above 15 billion USD are excluded. While the EGRRCPA does affect very large banks, their numbers are too small to perform any proper empirical study.

Hypothesis Development

This paper attempts to understand how the three groups of banks below, near below and near above the 10 billion USD asset threshold react to the partial repeal of the Dodd-Frank Act through the Economic Growth, Regulatory Relief and Consumer Protection Act (EGRRCPA).

Section-1 Event study

The Event study builds on the ones conducted in Bowman et al. (2018) and Srivastav and Vallascas (2019). We hypothesize that the abnormal reactions will be different for each group around the key dates. Indirectly Treated banks will react stronger than Untreated banks and Treated banks. The EGRRCPA's relief for banks crossing the 10 billion USD threshold provides greater benefit to Indirectly Treated banks. Treated banks, being around 10-15 billion, are not large enough to take advantage of the components of the act that offer benefits to very large banks. Bowman et al.() and Bindal et al.() show that Indirectly Treated banks regulate their capital and loan structure to avoid crossing the threshold, so the deregulation will provide greater incentive to Indirectly Treated banks to grow and this incentive will lead to greater positive impact for Indirectly Treated banks compared to the other groups.

H1a: For Indirectly Treated banks closer to the US 10 billion threshold, the market reacts more strongly than banks farther below the threshold

H1b: Indirectly Treated banks will have more significant abnormal returns than banks that are already above the threshold

Section-2 Bank Behaviour Pre and Post EGRRCPA

Barth et al (2004) and Beck et al (2006) suggest that deregulation can impact banks in multiple ways, from changes in their funding strategy to capital structure and profitability. The EGRRCPA has altered compliance incentives, and the changes are expected to be reflected in the metrics for all three groups. Indirectly Treated banks now have a greater incentive to grow and cross the USD 10 billion threshold, and this will be reflected in the changes in their growth metrics. EGRRCPA will impact the profitability of all banks.

H2a: EGRRCPA will lead to significant changes in the profitability, growth, operational efficiency, risk strategy and capital structure for Untreated, Treated and Indirectly Treated banks.

H2b: Indirectly Treated banks will significantly change their growth metrics more than Untreated and Treated banks after deregulation

H2c: EGRRCPA will have a greater impact on the profitability of Indirectly Treated banks compared to Untreated banks

Section-3 Crossers and Non-Crossers

For the banks who cross the 10 billion asset threshold EGRRCPA does remove some of the costs of crossing this threshold. However there remains significant compliance costs for banks with assets

over 10 billion USD. Crosser banks will need to change their capital structure and risk prevention measures.

H3a: Crosser banks will show significant conservative changes to capital structure and risk metrics post-deregulation compared to Non-Crosser banks.

Banks that are just below the asset threshold, the Indirectly Treated banks, are the most incentivized to cross the threshold thanks to the passing of EGRRCPA. However, Untreated banks have to grow more to cross the threshold, the impact of the partial Dodd-Frank repeal will impact the growth metrics of the Untreated banks more.

H3b: EGRRCPA will have a greater impact on the growth metric of Untreated Crossers compared to Indirectly Treated Crosser

Section-4 Mergers and Acquisitions

With EGRRCPA reducing the cost of crossing the threshold, 23 of the 30 Indirectly Treated banks and 16 of the 45 Untreated banks crossed the 10 billion USD following the beginning of the deregulation process. As per Ovtchinnikov (2013) deregulation leads to increased M&A. The passing of EGRRCPA should lead to a statistically significant change in the M&A rate of below threshold banks.

H4a: Deregulation will have a significant positive impact on the M&A rate of banks below the threshold.

H4b: EGRRCPA will lead to a greater increase in M&A rates for Untreated banks relative to Indirectly Treated banks.

H4c: M&A helps below threshold banks cross 10 billion USD faster than banks that do not undergo mergers and acquisitions

Section-1: Event Study

For the event study, we focus on how the bank stock across the various groups reacted to certain key developments.

Timeline

In the timeline construction, the early signalling phase is incorporated. Numerous well-regarded regulatory studies, such as Binder et al. (1997) etc., have shown that markets can react very quickly to early indicators.

This paper investigates the market reactions around 11 key dates. In this paper, the dates 7th June 2016 and 18th July 2016 are grouped as very early indicators of political and policy signalling. These two dates made a clear indication of the direction a potential republican administration is

going towards about bank regulation. Two more dates, 3rd February 2017, when the executive order to review financial regulations is signed, and 26th April 2017, when the Financial Choice Act is introduced, indicate the start of the legislative process. These two dates set the scene for the coming deregulation. We indicate 5 key dates in the third phase labelled as Legislated Momentum phase. These dates are 8th June 2017, 16th November 2017, 5th December 2017, 7th March 2018 and 14th March 2018. This is the phase where all the major components of the ERGRRCPA are introduced and passed various legislation hurdles. The last 2 dates 22nd May and 24th May 2018 are final regulatory implementation phase.

Figure 2 Key Dates

Event Phases	**Date**	**Event Description**
Early Political and Policy Signs Phase	07-Jun-16	Presidential nominee meets with the chairman of the House Financial Services Committee.
	18-Jul-16	The Republican National Convention supports the repeal of Dodd Frank
Executive Order and Early Legislation Phase	03-Feb-17	The President signs Executive Order 13722 to review financial regulations.
	26-Apr-17	The Financial Choice Act was introduced, formalizing the start of the legal procedures for the Dodd-Frank repeal
Legislative Momentum Phase	08-Jun-17	Financial CHOICE Act passes in the HOUSE
	16-Nov-17	Senate Introduction of Economic Growth, Regulatory Relief, and Consumer Protection Act (S. 2155)
	05-Dec-17	EGRRCPA passes the Senate Banking Committee vote and reaches the floor
	07-Mar-18	Passed the Senate cloture vote
	14-Mar-18	EGRRCPA passes Senate with bipartisan support
Regulatory Implementation Phase	22-May-18	The House passed S. 2155.
	24-May-18	President Trump signs EGRRCPA into law.

Figure 3: CARs and Patell Z-statistics by Group and Event Date

Event Date	**Group**	**N Obs**	**CAR (-1,+1)**	**CAR (-1,+2)**	**Patell Z (-1,+1)**	**Patell Z (-1,+2)**
Early Political and Policy Signs						
07/06/2016	Indirectly Treated	28	0.0006	-0.0062***	-0.18268	-2.49828**
	Treated	12	0.00056	-0.0055	0.06919	-0.44475
	Untreated	40	0.0037	-0.0012	0.64896	-1.89328*
18/07/2016	Indirectly Treated	28	-0.0076***	-0.0171***	-0.32027	-3.10367***
	Treated	12	-0.0056**	-0.0132***	0.06486	-0.74605
	Untreated	40	-0.0037**	-0.0124***	0.03067	-2.95268***
Executive Order and Early Legislation Phase						
03/02/2017	Indirectly Treated	28	-0.0018	-0.0018	-2.60825***	-3.61027***

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Event Date	Group	N Obs	CAR (-1,+1)	CAR (-1,+2)	Patell Z (-1,+1)	Patell Z (-1,+2)
	Treated	12	-0.00208	-0.00208	-0.68905	-0.99379
	Untreated	40	-0.001	-0.001	-2.36479**	-4.16775***
26/04/2017	Indirectly Treated	27	-0.0062	-0.0227***	-1.42912	-4.03786***
	Treated	12	-0.00476	-0.0248**	-0.46576	-2.17861**
	Untreated	39	-0.0078*	-0.0151	-3.55939***	-6.08518***
Legislative Momentum Phase						
08/06/2017	Indirectly Treated	27	0.0773***	0.0773***	15.7871***	10.0288***
	Treated	12	0.0905***	0.0905***	7.70669***	4.65787***
	Untreated	39	0.0740***	0.0740***	26.0063***	11.9308***
16/11/2017	Indirectly Treated	27	0.0056**	0.0056**	2.44188**	3.68855***
	Treated	12	0.0128***	0.0128***	0.0128	1.99584**
	Untreated	39	0.0092***	0.0092***	3.12285***	5.58705***
05/12/2017	Indirectly Treated	26	-0.0041	-0.0078**	-0.90384	-2.41983**
	Treated	12	-0.00363	-0.00682**	-0.27979	-0.77872
	Untreated	39	-0.0026	-0.0067	-2.06968**	-3.31705***
07/03/2018	Indirectly Treated	26	0.0025*	0.0055***	0.64246	1.42056
	Treated	12	0.000587	0.0017	0.37872	0.54338
	Untreated	40	0.0014	0.0041*	0.62340	0.74658
14/03/2018	Indirectly Treated	26	0.0060***	0.0096***	2.53703**	3.11226***
	Treated	12	0.001163	0.0061	0.26178	0.77370
	Untreated	40	0.0046***	0.0066***	2.23146**	3.11925***
Regulatory Implementation Phase						
22/05/2018	Indirectly Treated	26	0.0092***	0.0089***	3.90977***	3.09445***
	Treated	12	0.00857	0.00873**	0.78214	-0.20927
	Untreated	40	0.0038	0.0009	2.20626**	2.67267***
24/05/2018	Indirectly Treated	26	-0.0007	-0.0007	-3.10273***	-3.10273***
	Treated	12	-0.0067***	-0.0067***	-6.82024***	-6.82024***
	Untreated	40	-0.0041*	-0.0041*	-1.19974	-1.19974

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Abnormal returns

The estimation window for the study starts at 210 days and ends at 10 days before each event, allowing us to capture the market movements before events. Since this is a regulatory study, all the banks' securities are expected to be affected on the same day. To be able to capture the market shock, 2 event windows are observed. A three-day and four-day window (-1,0,+1) and (-1,0,+1,+2) is used. Since this paper focuses on the commercial banks and bank holding companies in the United States, we expect the market to process regulatory shocks very quickly, as it is a highly efficient market.

The market model is to calculate abnormal returns and cumulative abnormal returns.

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t})$$

Where:

- $AR_{i,t}$: Abnormal return for bank i on day t.
- $R_{i,t}$: Actual return of bank i on day t.
- α_i: Estimated intercept from the OLS regression of bank i's returns on market returns during the estimation window.
- β_i: Estimated market beta (slope coefficient) for bank i, capturing the sensitivity of the bank's return to market return fluctuations.
- $R_{m,t}$: Market return on day t (in your case, the CRSP value-weighted market return VWRETD).

To test significance, simple one-way T-tests and Patell Z test are run. Both methods are highly established in event study literature. The Patell Z accounts for cross-sectional dependence, making our findings more robust.

In the spirit of Bouwman (2018), we also conducted a Hedge Portfolio for each event date and window. The hedge portfolio is constructed by looking at the difference between the CARS of each group.

From the RSSID-CRSP-COMPUSTAT linking table, we get 235 banks below 4 billion USD and 56 banks that are too large; we exclude these banks from our analysis. The paper focuses on 30 Indirectly Treated, 12 Treated and 45 Untreated banks as per our 2016 asset classification.

Event Study Results

The earliest indicator date, 7th Jun 2016, shows no significant response from Treated and Untreated banks. Indirectly Treated banks showed significant but small negative returns on the longer window. This highlights the fact that it took the market some time to adjust to the news and that investors are unsure about the effect of potential Dodd-Frank repeal.

The second early phase date 18th July 2016, the day the republican national convention announced their support for Dodd-Frank repeal, experience significant negative abnormal returns in

both windows for all banking groups. The significant CARS would suggest that investors strongly react to the news. Caution is advised at this interpretation as Patell Z only shows significance for Indirectly Treated and Untreated banks in the longer window, and no significance for Treated banks. The political nature of the event, compounded by the fact that investors did not know who would win the election, would lend credence to the more delayed significance that can be seen on the Patell Z.

When the Financial Choice Act is introduced on 26th April 2017, it is part of the early legislation phase of the deregulation process. We see a significant negative abnormal CAR (-0.0227) in the 4-day window for Indirectly Treated banks. Treated banks also had a significant negative CAR in the 4-day window. This result further strengthens this paper's decision to study both the (-1,+1) and the (-1,+2) windows. Untreated banks experience significant negative reactions in both windows. For complicated deregulation steps, during the early stages, the market needs longer to capture their reactions, and the investors are still skeptical of deregulation.

On 8th June 2017, the Financial Choice Act is passed, and it leads to significant positive abnormal returns for both windows for all banking groups. The significance of the results holds in both t-tests and Patell Z. Investors started to believe that deregulation is indeed possible and that it would be good for the banks. The significant positive CAR for Untreated banks signifies that investors felt that deregulation would be good for the banking industry as a whole and not only for medium and large banks. 16th November 2017 had a moderately positive CAR, which are significant across both windows for all banks as well. Barring 5th December, the other 2 dates of the momentum build-up phase had positive abnormal returns. This is most evident on 14th March 2018, when the EGRRCPA passed the Senate with Bipartisan support. Both Untreated and Indirectly Treated banks experience significant positive CARs but Treated banks' positive CARs have low significance.

As we move into the final implementation phases, we find that the results, while remaining significant, start to become more muted. On 22nd May 2018, the House passed the ERCGPPA bill. We find a very significant albeit moderate positive abnormal CAR for Indirectly Treated banks across both windows. The CAR for all groups are positive but not significant for Treated banks. Indirectly Treated banks have the highest positive CAR of 0.0092 and 0.0089 across the 2 windows. This is an indication that the market has already priced in the deregulation benefits for the banks. This is inline with previous regulatory event studies which show that an efficient market prices the changes in regulation long before the final passing date. On 24th May 2018, when the law is signed into place, Indirectly Treated and Treated banks have negative abnormal returns

which are highly significant under Patell Z. There could be two reasons for the negative returns. It could be a sign that investors understood that the deregulation process in its final form while good for the banks would be a long, slow and complicated process, leading them to reduce their expectations. A more likely reason could be that the negative returns is due to the 'sell-the-news' effect. Investors had already priced in the benefits of the deregulation and are now selling their positions and profiting from their analysis.

The Appendix includes the event study, with only 6 Treated banks. These are the Treated banks whose asset sizes are between 10-13 billion USD. There is no major difference between the study with the reduced Treated bank sample and the one above. This adds robustness to the results.

Figure 4 Hedge Portfolio Returns

Date	**Event / Portfolio**	**(-1,+1)**	**(-1,+2)**
	Republican national Convention supports repeal of Dodd Frank		
	Treated - Untreated	-0.00196	-0.00076
18/07/2016	Indirectly Treated - Untreated	-0.00384	-0.00465
	Treated - Indirectly Treated	0.00188	0.00389
	Financial Choice Act Introduced		
	Treated - Untreated	0.01056	-0.00237
26/04/2017	Indirectly Treated - Untreated	0.001602	-0.00764
	Treated - Indirectly Treated	0.008958	0.00527
	Financial Choice Act Passes		
	Treated - Untreated	0.018677	0.016474
08/06/2017	Indirectly Treated - Untreated	0.003224	0.003224
	Treated - Indirectly Treated	0.015452	0.013249
	Senate Introduction of EGRRCPA		
	Treated - Untreated	0.003573	0.003573
16/11/2017	Indirectly Treated - Untreated	-0.0036	-0.0036
	Treated - Indirectly Treated	0.007168	0.007168

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Table – continued from previous page

Date	Event / Portfolio	(-1,+1)	(-1,+2)
	EGRRCPA Passes Senate		
	Treated - Untreated	-0.00345	-0.00048
14/03/2018	Indirectly Treated - Untreated	0.001385	0.00299
	Treated - Indirectly Treated	-0.00484	-0.00347
	House Passes EGRRCPA		
	Treated - Untreated	0.00479	0.007851
22/05/2018	Indirectly Treated - Untreated	0.00542	0.008013
	Treated - Indirectly Treated	-0.00063	-0.00016
	President signs EGRRCPA into Law		
	Treated - Untreated	-0.00259	-0.00259
24/05/2018	Indirectly Treated - Untreated	0.003431	0.003431
	Treated - Indirectly Treated	-0.00602	-0.00602

Note: This table reports the difference in cumulative abnormal returns (CARs) between groups of banks over two event windows: (-1,+1) and (-1,+2), where Day 0 is the event date. A positive value implies the first group in the hedge portfolio outperformed the second group in the specified window. All events correspond to key legislative milestones in the repeal of Dodd-Frank and the passage of EGRRCPA.

Portfolio Returns

In Figure 4, the hedge portfolio returns are present. This table illustrates the differences in mean abnormal returns for our three groups.

In one of the earliest significant indicator dates, all three groups show negative CARs for both dates. Untreated banks perform the best and Indirectly Treated banks have the most negative CARs. This demonstrates investor uncertainty over how a possible deregulation process would develop.

On the day the 'Financial Choice Act' gets introduced, all 3 three groups have significant negative reactions, with Treated banks outperforming both smaller groups in the initial 3-day window, but with smaller banks rebounding in the 4-day window. The market is skeptic about this development. The market reacts very optimistically on 8th June, when the 'Financial Choice Act' passes. The larger banks outperform the smaller ones consistently over both windows, with Treated banks performing the strongest.

On 16th November 2017, the day the EGRRCPA is first introduced to the senate, the market has a positive reaction, with Treated banks investors being the most optimistic and the Indirectly Treated bank investors being the most hesitant. On 14th March 2018, the day EGRRCPA passed the senate, the Indirectly Treated bank investors are more positive than the other groups, reacting to the deregulation provisions that would be highly beneficial for banks near the threshold.

When the EGRRCPA finally passes the house on 22nd May 2018, Indirectly Treated banks have their most positive reaction to date and Treated banks follow very closely, Untreated banks have the most muted positive return. The reactions are similar in both windows and illustrates how the market thought that deregulation would benefit the banks above 7 billion USD more than it would the smaller banks. On 24th May 2018, the Untreated banks almost entirely reversed their previous positive cars, and Treated banks also had negative reactions. Indirectly Treated banks have very marginal negative returns.

Over all the hedge analysis clarifies and cements the results from the event study table and show that Indirectly Treated banks consistently had strong abnormal reactions to the indicator dates and their returns during the implementation phase lends credence to the idea that the EGRRCPA stands to benefit near threshold banks over other groups.

Section-1 Hypothesis

From the analysis, we can safely say that we can accept hypothesis H1a, which states that returns of Indirectly Treated banks closer to the US 10 billion threshold react more strongly than banks farther below the threshold.

Indirectly Treated banks have consistently have more significant abnormal returns around key event dates compared to Untreated banks and the abnormal returns have also have greater magnitude.

We can also safely accept H1b, which states Indirectly Treated banks will have more significant abnormal returns than banks that are already above the threshold.

Indirectly Treated banks have more significant abnormal returns than Treated banks. On the day the EGGRCPA passed the House, the positive abnormal returns for Indirectly Treated banks are greater in magnitude than those of Treated banks.

Section 2: Indirectly Treated vs Untreated vs Treated

In Bindal et al. (2017), the authors conducted tests on two key opposing hypotheses: that banks just below the asset limit to be affected by the Dodd-Frank Regulations would either be less acquisitive

so as not to cross the threshold and not incur cost increases, or they would be more acquisitive as being acquisitive would allow them to grow their size more rapidly to better absorb the costs of the regulations. In their paper, the authors find that the banks just below the threshold are more likely to acquire.

In our paper, we are studying a regulation that is a rollback of Dodd-Frank. The prevailing hypothesis of this paper is the assumption that banks below the threshold are more likely to acquire, and furthermore, are using acquisitions to cross the threshold.

When we investigate the number of banks in our event study, 28 of the 30 Indirectly Treated banks and 23 of the 45 Untreated banks conduct mergers and acquisitions. Twenty-three of the Indirectly Treated banks crossed the 10 billion USD threshold as did 16 of the Untreated banks. Of the 23 Indirectly Treated banks that crossed 10 billion, all of them conducted M&As. Of the 16 Untreated banks who crossed 10 billion, 11 of them conducted M&As.

Summary Statistics

Figure 5 provides the summary statistics of all 81 banks (30 Indirectly Treated, 45 Untreated and 6 Treated banks) in this paper. It covers the full dataset from 2014 to 2024, so that we can observe long-term structural trends.

All three bank groups maintain roughly similar Return on Assets (ROA), with Treated banks being slightly higher. Treated banks have higher ROA than both other groups, and Untreated banks have the highest mean ROE. Treated banks also maintain higher Net Interest Income to Assets, possibly indicating superior loan pricing strategies. This demonstrates that despite stricter regulations, Treated banks maintain higher profitability than their smaller counterparts.

For capital and leverage strategies, we find that Treated banks maintain stronger capital buffers due to regulations. Treated banks have the highest capital ratios as expected. Untreated banks have a higher liability-to-equity ratio than their counterparts. Untreated banks appear to be more leveraged than their counterparts.

All three groups rely heavily on deposits as a funding source, implying that size-based regulations do not seem to affect deposit structure. For risk and loss provision indicators, Treated banks have greater provisions for allowance of potential losses.

To better gauge the changes in the banks in the study, the table shows the summary statistics, broken down into pre- and post-regulatory phases. This paper determines fiscal year 2017 as the start of the EGRRCPA period. Panel A is pre-deregulation and Panel B shows post-deregulation.

Figure 5: Summary Statistics (Panel A - Pre Deregulation)

Variable	Indirectly Treated				Treated				Untreated			
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev
ROA	87	0.0093319	0.0093947	0.0026939	36	0.0104098	0.0101118	0.0056345	130	0.0085901	0.0091454	0.0039642
ROE	87	0.0822487	0.0858509	0.0244448	36	0.0819182	0.0779641	0.0432855	130	0.0821293	0.0862049	0.0480666
Net Int Income to Assets	87	0.0311929	0.0310119	0.0040596	36	0.0312572	0.0305354	0.0043989	130	0.0302396	0.0296984	0.0062787
Capital and Leverage												
Leverage Ratio	87	8.9267478	8.368235	1.9061145	36	7.9328538	7.8613769	0.9062871	130	9.804969	9.4975571	2.185766
Equity to Assets	87	0.1159502	0.1194995	0.0193192	36	0.127604	0.1272173	0.0140521	130	0.1062863	0.1052915	0.0208871
Tier1 Capital Ratio	87	12.5241839	12.45	2.4542739	36	13.1491667	12.505	2.7110993	130	12.8081538	11.985	3.0437494
Total Capital Ratio	87	14.0844828	13.63	2.0402256	36	14.4013889	13.495	2.8254872	130	14.3326923	13.51	2.7816887
Tangible Eq to Total Assets	87	0.0851207	0.0825969	0.0156502	36	0.0930395	0.0897121	0.017708	130	0.0890563	0.0862384	0.0209099
Liabilities to Equity	87	7.9121329	7.368235	1.8769688	36	6.9307875	6.8503402	0.9068778	130	8.7919677	8.4475912	2.1854275
Capital to Deposits	87	0.1500319	0.1538398	0.0289578	36	0.1663088	0.1683625	0.0235243	130	0.1374417	0.1362147	0.0318353
Deposits to Assets	87	0.7776678	0.7845335	0.0532551	36	0.7713453	0.7677858	0.0390048	130	0.7819294	0.7893344	0.0689796
Risk and Loss Provision												
Loan Loss Provision to Assets	87	0.0012566	0.000931871	0.0019931	36	0.0016114	0.0016114	0.002814	130	0.00147	0.0010368	0.0029243
Allowance Loss to Assets	87	0.0012529	0.000931871	0.0019983	36	0.0016401	0.0016401	0.0028031	130	0.0014716	0.0010368	0.0029232
Liabilities to Assets	87	0.8828253	0.8805005	0.018043	36	0.8721244	0.8721244	0.0141759	130	0.8923928	0.89288	0.0211932
Provisions to Net Income	87	0.2667004	0.0978588	1.1768814	36	0.3393721	0.3393721	1.3379969	130	-0.8170398	0.1129494	8.1313015
Operational Efficiency												
Net Int Income to Op Income	87	0.7717406	0.7662385	0.0908766	36	0.7677949	0.7739808	0.102844	130	0.7869039	0.7875397	0.1173193
Diversification of Non Int income	87	0.2282594	0.2337615	0.0908766	36	0.2322051	0.2260192	0.102844	130	0.2130961	0.2124603	0.1173193
Interest Dependence ratio	87	0.6542412	0.6588284	0.0976115	36	0.6944801	0.7083102	0.115094	130	0.6400655	0.6348538	0.1641418
Growth Metrics												
Asset Growth	87	-0.0029671	0.0645355	0.3880879	35	0.0928542	0.045588	0.4340749	130	-0.1144807	0.0574277	0.390918
Equity Growth	87	0.0379515	0.0601469	0.4689444	34	0.2058302	0.0546151	0.5992207	129	-0.1177234	0.0422252	0.4105949
Deposit Growth	87	-0.0051108	0.0663179	0.3956458	35	0.0710844	0.0327282	0.4303468	130	-0.119359	0.0549025	0.3961928

Figure 5: Summary Statistics (Panel B - Post Deregulation)

Variable	Indirectly Treated				Treated				Untreated			
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev
ROA	187	0.010380	0.011176	0.005419	90	0.010945	0.011496	0.007980	292	0.010929	0.011041	0.004282
ROE	187	0.085727	0.089613	0.051941	89	0.086090	0.089212	0.079779	292	0.100619	0.099147	0.040371
Net Int Income to Assets	187	0.030170	0.029601	0.003894	90	0.030636	0.030070	0.004975	292	0.030444	0.030253	0.005390
Leverage Ratio	187	8.555308	8.115169	2.082874	89	8.163495	8.118665	1.669683	292	9.428281	9.072544	2.042711
Equity to Assets	187	0.122351	0.123226	0.023975	89	0.127314	0.123173	0.024661	292	0.110472	0.110223	0.021391
Tier1 Capital Ratio	181	12.583917	12.390000	1.692515	90	13.315000	12.230000	3.196121	285	12.912965	12.400000	2.360882
Total Capital Ratio	182	14.559956	14.365000	1.607502	90	15.030556	14.115000	3.275106	287	14.848920	14.460000	2.087633
Tangible Eq to Total Assets	187	0.083772	0.083449	0.012849	90	0.092149	0.086650	0.023212	292	0.089814	0.087730	0.015227
Liabilities to Equity	187	7.542579	7.115169	2.057274	89	7.152845	7.118665	1.666271	292	8.421004	8.072544	2.042253
Capital to Deposits	187	0.154885	0.152741	0.033922	89	0.161283	0.151661	0.038426	292	0.137376	0.135515	0.029659
Deposits to Assets	187	0.794616	0.797256	0.045217	90	0.798067	0.800138	0.046763	292	0.809441	0.815704	0.049249
Loan Loss Prov. to Assets	168	0.001404	0.000933	0.002258	89	0.001698	0.001313	0.002249	265	0.001681	0.001051	0.002552
Allowance Loss to Assets	187	0.001456	0.000976	0.002192	90	0.001677	0.001296	0.002238	292	0.001683	0.001068	0.002505
Liabilities to Assets	187	0.876543	0.876774	0.023021	90	0.871473	0.874494	0.024191	292	0.888751	0.889334	0.021553
Provisions to Net Income	168	-0.166516	0.079866	3.992753	89	0.181690	0.095640	0.329298	265	-0.024428	0.094313	3.944040
Net Int Income to Op Income	187	0.783587	0.793790	0.076590	90	0.806305	0.801231	0.096566	292	0.817704	0.823217	0.100350
Diversification of Non-Int Inc.	186	0.216413	0.206210	0.076590	90	0.193696	0.198770	0.096566	292	0.182296	0.176783	0.100350
Interest Dependence Ratio	187	0.657719	0.664575	0.113272	90	0.683558	0.684153	0.142319	292	0.663857	0.661467	0.136696
Asset Growth	187	0.113386	0.054392	0.178156	90	0.107066	0.055309	0.185430	292	0.066386	0.065877	0.142696
Equity Growth	187	0.126548	0.070457	0.215032	89	0.102492	0.066281	0.217900	292	0.066386	0.075255	0.200936
Deposit Growth	187	0.118735	0.066744	0.183170	90	0.118910	0.073755	0.188811	292	0.066386	0.068727	0.148012

From the breakdown, we find that after 2016, there appears to be a rise in the profitability metrics for all groups. *Return on Assets* (ROA) experience a small increase across all groups, with *Treated* banks having the largest growth of 1.07% post-2016. ROE also experience improvement, with *Untreated* banks showing the largest increase from 8.21% pre-2016 to 10.06% post-2016. NIM remained almost unchanged. For capital structural changes, *Treated* banks increased their leverage ratio slightly from 7.91 to 8.06, *Indirectly Treated* banks decreased theirs, implying that *Indirectly Treated* banks are more conservative in managing their capital *post-deregulation*. *Equity to Assets ratio* increased in all groups, with *Indirectly Treated* banks having the largest increase. In their loss prevention indicators, all banks increased their loan loss Provisions to assets. This could indicate that, despite deregulations, banks anticipated higher credit risks. *Liabilities to Equity Ratio* decreased in all banks as well. In terms of operational efficiency, all banking groups seem not to have altered their revenue structure very much as *Net Interest Income to Operating Income* ratios remained stable pre- and post-deregulation. *Indirectly Treated* banks experience a modest increase in the cost to income ratio, and *Treated* banks have the biggest increase in this regard. *Post-deregulation*, all three banking groups seem to have worsened cost efficiency, but the change for *Indirectly Treated* and *Untreated* banks is very small.

In Growth metrics, we find the biggest changes. Asset growth pre-deregulation is slightly negative for *Untreated* and *Indirectly Treated* banks. This indicates that asset growth is almost stagnant and this in line with previous literature that banks will slow down their growth to void crossing threshold that would increase their regulatory expenses. Post 2016, we see a sharp increase in growth rates for all 3 groups, with *Indirectly Treated* banks growth rate increasing from negative 0.3% to a staggering 11.9%. This indicates that deregulation has incentivized aggressive growth rates for banks.

To further cement the findings, this paper utilizes a Wilcoxon Rank Sum test to check if the changes pre and *post-deregulation* are statistically significant. This is *a non parametric test*, that is robust to non normality and suitable for unequal sample sizes. Previous event study literature such as Berger et al 2017 has used this test to study regulatory impacts.

Figure 6: Intra Group Wilcoxon Results

Variable	Treated			Indirectly Treated			Untreated		
	Pre-2016	Post-2016	*p*-value	Pre-2016	Post-2016	*p*-value	Pre-2016	Post-2016	*p*-value
ROA	0.0101	0.0115	0.0001	0.0094	0.0112	¡0.0001	0.0091	0.0110	¡0.0001
ROE	0.0780	0.0892	0.0001	0.0859	0.0896	¡0.0001	0.0862	0.0991	¡0.0001
Net_Int_Income_to_Assets	0.0305	0.0301	0.0005	0.0310	0.0296	0.0002	0.0297	0.0303	0.0429
LeveragevRatio	7.8614	8.1187	0.0040	8.3682	8.1152	0.0024	9.4976	9.0725	0.0200
Equity to Assets	0.1272	0.1232	0.0040	0.1195	0.1232	0.0024	0.1053	0.1102	0.0200
Tier1 Capital Ratio	12.5050	12.2300	0.7613	12.4500	12.3900	¡0.0001	11.9850	12.4000	0.0217
Total Capital Ratio	13.4950	14.1150	0.2350	13.6300	14.3650	¡0.0001	13.5100	14.4600	¡0.0001
Tangible Eq to Total_Assets	0.0897	0.0866	0.4404	0.0826	0.0834	¡0.0001	0.0862	0.0877	0.0012
Liabilities to Equity	6.8503	7.1187	0.0048	7.3682	7.1152	0.0025	8.4476	8.0725	0.0207
Capital to Deposits	0.1684	0.1517	0.0010	0.1538	0.1355	0.0099	0.1362	0.1355	0.0192
Deposits to Assets	0.7678	0.8001	0.0005	0.7845	0.0667	¡0.0001	0.7893	0.8157	¡0.0001
Loan Loss Provision to Assets	0.0011	0.0011	¡0.0001	0.0009	0.0010	¡0.0001	0.0010	0.0011	¡0.0001
Allowance Loss to Assets	0.0011	0.0013	0.0001	0.0009	0.0010	¡0.0001	0.0010	0.0011	¡0.0001
Liabilities to Assets	0.8722	0.8745	0.0099	0.8805	0.8786	0.0008	0.8929	0.8893	0.0345
Provisions to Net Income	0.0989	0.0976	0.0579	0.0979	0.0986	¡0.0001	0.1129	0.0943	¡0.0001
Net Int Income to Op Income	0.7740	0.8012	0.2235	0.7662	0.7938	0.0020	0.7875	0.8232	0.0696
Diversification of Non Int income	0.2260	0.1988	0.2235	0.2338	0.2062	0.0025	0.2125	0.1768	0.0696
Interest Dependence ratio	0.7083	0.6842	0.1176	0.6588	0.6646	¡0.0001	0.6349	0.6516	¡0.0001
Asset Growth	0.0456	0.0553	0.0195	0.0645	0.0544	¡0.0001	0.0574	0.0659	¡0.0001
Equity Growth	0.0546	0.0638	0.0002	0.0601	0.0705	¡0.0001	0.0422	0.0753	¡0.0001
Deposit Growth	0.0327	0.0738	0.0002	0.0663	0.0667	¡0.0001	0.0549	0.0687	¡0.0001

Note: This table reports the results of Wilcoxon signed-rank tests comparing pre-2016 and post-2016 medians for each bank group (Treated, Indirectly Treated, and Untreated). The test is a non-parametric alternative to the paired sample t-test and does not assume normality of the data. Reported are median values for each period and the corresponding *p*-values. A *p*-value less than 0.05 indicates a statistically significant change in the median between the two periods.$<$ 0.0001 indicates that the p-value is less than 0.0001. This denotes a highly statistically significant change in medians as per the Wilcoxon signed-rank test.

Treated Banks

Treated banks have very high significance for changes in ROA (p-value < 0.001) and ROE (p-value < 0.001); it can imply that deregulation allowed banks to improve their profitability. Net Interest Income to Assets experience a very slight decrease, but the decrease is *statistically significant*. All leverage indicators, but not capital ratios, are *statistically significant*. The lack of significance for capital ratios is understandable as EGRRCPA does not change the capital requirements for banks and previous capital regulations remain present. The increase in leverage and reduction in equity-to-assets ratios post-deregulation indicate that the Treated banks are using more leverage to expand and grow and take more risks. This is further substantiated by the highly significant increase in both Loan Loss Provision to Assets and Allowance loss to assets ratios (both having p-values < 0.001). The above-threshold banks are growing more profitable and growing faster, and increasing their lending following deregulation, but are remaining prudent and preparing themselves appropriately for the risks that come with increased growth.

Deposit growth more than doubled, and this increase is the most *statistically significant* (p-value $<$ 0.001) of the three growth metrics, further enforcing the extrapolation that Treated banks are using deposits more than equity to grow after EGRRCPA. The median asset growth and equity growth also improved after deregulation; however, the difference in equity growth is only *marginally significant*.

Indirectly Treated Banks

Indirectly Treated banks show a *significant increase* in ROA and ROE and a small *significant decline* in Net Interest Income to Assets post-deregulation. Overall profitability trends show increased *statistically significant* growth post-deregulation. There is a *significant increase* in Net Interest Income to Operating Income post-deregulation, further showing improvement in operations and increased earnings from interest-based activities. When analyzing their capital structure and leverage, we can observe a *statistically significant* but moderate decrease in the leverage ratio, signalling a shift towards greater capitalization. This is further supported by a *significant increase* in the Equity to Assets ratio and Total Capital ratio, indicating a more stable capital base. A moderate but *significant decline* in the Liabilities to Equity Ratio shows a further decline in external liabilities in comparison to equity. This points to a greater utilization of equity for growth compared to pre-deregulation periods. Indirectly Treated banks show a *significant increase* in Loan Loss Provision to Assets and Allowance for Loan Losses to Assets, suggesting that banks are being prudent in their risk exposure. A *statistically significant decline* in Liabilities to Assets further strengthens the view that Indirectly Treated banks are shifting away from more volatile external sources of funding.

The drop in Provisions to Net Income indicates that while provisions for risks are being shored, the increase in profitability in the same time frame means that provisions have not increased as much as profits. Deposit growth increase is *highly statistically significant*; however, it did not increase as much as the equity growth. Overall, Indirectly Treated banks focused on improving their capital structure post-EGRRCPA.

Indirectly Treated banks show a sharp and *significant increase* in mean asset and equity growth, with equity growth outpacing asset growth. Indirectly Treated banks went from near stagnant growth pre-deregulation to remaining below the regulatory threshold to *significantly high growth* post-deregulation. This expansion appears to be funded through a mix of deposit growth and mergers and acquisitions. We will be looking into the M&A aspect in Section 4 of this paper. However, the Wilcoxon test, which compares medians, showed that Indirectly Treated banks have *reduced growth rates* post-deregulation. This is a *significant finding*. In this paper, we did not put a time limit on the effect of deregulation, and the data extends up to 2023. The fact that Wilcoxon and median show a slowdown in growth metrics could highlight that a good number of Indirectly Treated banks could have stopped growing as aggressively after they crossed the $10 billion threshold, while others kept on expanding at high speeds. This could be investigated in future research.

Untreated Banks

From the test results, we find that Untreated banks have a *statistically significant* but moderate decrease in their leverage ratio; this, coupled with a *significant increase* in Total Capital Ratio, indicates that Untreated banks are building robust capital structures. Equity to Assets ratio declines, and an increase in Tangible Equity to Assets suggests that while the Untreated banks may be taking on more risk and expanding, they are taking a balanced approach to growth and trying to mitigate risk with increased capitalization. Liabilities to Equity Ratio and Capital to Deposits ratio both declined moderately, which might indicate that Untreated banks rely more on deposits for funding their expansion than on external liabilities.

Loan Loss Provision and Allowance for Loan Losses to Assets both rose slightly post-deregulation, indicating that Untreated banks increase their credit risk provisioning and took on more risk to grow, either via organic lending or through M&As. Liabilities to Assets do not change in a *statistically meaningful* way, showing that, unlike Indirectly Treated banks, they did not reduce their non-deposit funding and kept a diversified funding mix.

Untreated banks experience *statistically significant* sharp increase in ROE and ROA post-deregulation. They experience a moderate increase in Net Interest Income to Assets, possibly indicating an im-

proved loan spread. Net Interest Income to Operating Income and Non-Interest Income to Total Non-Interest Income do not see much change, indicating that revenue structure remains similar. This can indicate that increased profitability is more due to increased size and balance sheet expansion, and slightly due to moderately improved margins rather than diversification of revenue streams. The Provision to Net Income has gone down *significantly*, indicating that banks, while preparing for more risk, are making more efficient use of their profit.

Interest Dependence Ratio, like Indirectly Treated banks, shows a moderate but *significant increase*, showing that Untreated banks experience an increase in non-interest income.

Untreated banks use deposit funding post-deregulation to grow, as we find a *significant increase* in the Deposit to Assets Ratio. This is further supported by the fact that Untreated banks have a *statistically moderate decrease* in the Funding Liabilities to Assets ratio. Capital to Deposits experience a very slight decrease. Untreated banks grow with a stable capital structure and reduced dependence on volatile external funds. Asset growth, equity growth and deposit growth are high and *statistically very significant*.

Overall, the ratios seem to point towards fast growth, using balance sheet changes and deposit growth. This points to the fact that some banks grow organically and some via M&As. Of the 45 Untreated banks in our study, 23 of them undergo M&A, 16 of them crossed the $10B threshold, and 11 of them undergo an M&A before crossing the threshold, further substantiating the findings of our ratio analysis.

Comparison Across Groups

After looking at changes within the same groups, pre- and post-EGRRCPA, we now investigate the comparison between banks after deregulation. In Figure 7, there are two panels. Panel A shows the comparison where the Treated bank asset grouping is $10–15 billion, and the number of Treated banks is 12. In Panel B, the Treated banks are classified according to the original Bindal et al. and Bouwman et al. papers, which indicate a range of between $10 and $13 billion, and the number of Treated banks is 6.

Figure 7: Post-deregulation Intergroup Wilcoxon Results 1

Variables	Indirectly Treated vs Treated			Treated vs Untreated		
	Indirectly Median	Treated Median	Wilcoxon P Value	Treated Median	Untreated Median	Wilcoxon P Value
Panel A						
Tangible Eq to Total Assets	0.0834	0.0866	0.0138			
Net Int Income to Op Income	0.7938	0.8012	0.0405			
Diversification of Non Int income	0.2062	0.1988	0.0709			
Interest Dependence ratio	0.6646	0.6842	0.0371			
ROE				0.0115	0.0991	0.0095
Leverage Ratio				8.1187	9.0725	¡0.0001
Equity to Assets				0.1232	0.1102	¡0.0001
Funding Liabilities to Assets				0.8745	0.8893	¡0.0001
Liabilities to Equity				7.1187	8.0725	¡0.0001
Capital to Deposits				0.1517	0.1355	¡0.0001
Deposits to Assets				0.8001	0.8157	¡0.0001
Interest Dependence ratio				0.6842	0.6615	0.0657
Panel B						
ROA	0.0112	0.0129	0.0289			

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Table – continued from previous page

Variables	Indirectly Treated vs Treated			Treated vs Untreated		
	Indirectly Median	Treated Median	Wilcoxon P Value	Treated Median	Untreated Median	Wilcoxon P Value
Net Int Income to Assets	0.0296	0.0315	0.0785			
Leverage Ratio	8.1152	7.5669	0.0828	7.5669	9.0725	¡0.0001
Equity to Assets	0.1232	0.1322	0.0855	0.1322	0.1102	¡0.0001
Tangible Eq to Total Assets	0.0834	0.0868	0.0042			
Liabilities to Equity	7.1152	6.5648	0.0715	6.5648	8.0725	¡0.0001
Loan Loss Provision to Assets	0.0009	0.0018	0.0309	0.0018	0.0011	0.0121
Allowance Loss to Assets	0.0009	0.0018	0.0309	0.0018	0.0011	0.0085
Funding Liabilities to Assets	0.8768	0.8681	0.0747	0.8681	0.8893	¡0.0001
Provisions to Net Income	0.0799	0.1211	0.0709			
Interest Dependence ratio	0.6646	0.7096	0.0233	0.7096	0.6615	0.0421

Note: This table reports post-deregulation intergroup Wilcoxon Rank-Sum test results between median values. The symbol "¡0.0001" denotes p-values smaller than 0.0001.

Indirectly Treated vs Treated Banks

In Figure 7, Panel A, we find that Treated banks have significantly higher tangible equity to total assets. As per our summary statistics, it is evident that Treated banks reduce tangible asset ratios after deregulation, whereas Indirectly Treated banks increase theirs; however, Treated banks retain statistically significant higher tangible asset to total asset level. In terms of *any of the profitability ratios*, *no statistical difference is found in the deregulation period*.

In terms of *operational efficiency from panel A*, we observe a statistically significant difference in the post-deregulation period across all three metrics. Treated banks have a statistically significantly higher dependence on net income, and their Non-interest income is marginally less diversified than the Indirectly Treated banks. When accounting for the *larger sample size*, we observe fewer statistically significant results than we can observe in panel B, which consists of a *more restricted number of Treated banks*.

In Panel B, we compare the Indirectly Treated banks to the six Treated banks that meet the original criteria. Indirectly Treated banks exhibit *no statistical differences in ROE* compared to Treated banks post-deregulation. While Indirectly Treated banks have significant changes in ROE and ROA pre and post EGRRCPA, after the deregulation Indirectly Treated and Treated banks have very similar mean profitability. During pre-deregulation, the difference between Indirectly Treated and Treated banks when it comes to ROA is as high as 0.0035; after the deregulation, the gap between ROA narrows down to only 0.0004. We find a *similar trend in growth metrics*. In the Indirectly Treated vs Untreated bank Wilcoxon test, the growth metrics *don't appear to be significant*, even though for the Indirectly Treated bank, equity, asset and deposit growth are all highly significant post-deregulation. The growth metrics, *similar to profitability metrics*, for Indirectly Treated banks seem to follow the same growth rates as Treated banks post-deregulation. In our pre-deregulation period, there is a big difference between the mean asset growth for Indirectly Treated banks when compared to Treated banks. Post 2016, the difference between the two is 0.56% and is not statistically significant. This indicates that post-deregulation, the Indirectly Treated are growing and following the same trends as Treated banks, as they are *no longer incentivized to stay below the threshold*.

We find that ROA for Indirectly Treated banks is *moderately statistically weaker* than Treated bank ROAs, which is expected as Treated banks benefit immediately from deregulation. Treated banks maintained significantly higher tangible equity as a percentage of total assets and keep a higher capital buffer, which is expected as well. While deregulation lifts some regulatory burdens, size-based compliance laws remain in force. Treated banks maintain higher loan loss provisions and remain more conservative compared to their smaller counterparts. Indirectly Treated banks maintain higher funding liabilities and are more reliant on external financing. Treated banks post-deregulation maintain higher dependence on interest income.

Treated vs Untreated

There appears to be *very little difference* between the results of Panel A and Panel B, when comparing Treated and Untreated banks. When compared to the expanded number of Treated banks, Untreated banks have significantly greater leverage than treated banks post-deregulation. Untreated banks and Treated banks have significant differences in capital structure, and this is to be expected. Unlike Indirectly Treated banks, Untreated banks are too small and *don't have to prepare for size-based regulatory capital requirements in a similar manner*. Untreated banks are more leveraged and have weaker capital positions. Untreated banks rely more on debt financing compared to Treated banks. Loan loss provisions and Allowance for Loan Losses to Assets are significantly higher for Treated banks. Untreated banks have significantly higher Funding Liabilities to Assets, implying that they rely more heavily on debt financing. Interest dependence ratio is lower for Untreated banks, but the difference is smaller and less significant in Panel A than Panel B.

Figure 8: Post-deregulation Intergroup Wilcoxon Results 2

Variables	Indirectly Treated	Untreated	Wilcoxon P Value
ROE	0.0896	0.0991	< 0.0001
Leverage Ratio	8.1152	9.0725	< 0.0001
Equity to Assets	0.1232	0.1102	< 0.0001
Tangible Eq to Total Assets	0.0834	0.0877	< 0.0001
Funding Liabilities to Assets	0.8767	0.8893	< 0.0001
Deposits to Assets	0.7973	0.8157	0.0004
Liabilities to Equity	7.1152	8.0725	< 0.0001
Capital to Deposits	0.1527	0.1355	< 0.0001
Net Int Income to Op Income	0.7938	0.8232	< 0.0001
Diversification of Non Int income	0.2062	0.1768	< 0.0001
Interest Dependence ratio	0.6646	0.6615	< 0.0001

Note: This table compares Indirectly Treated and Untreated banks post-deregulation using the Wilcoxon Rank-Sum test.
A "< 0.0001" indicates p-values less than 0.0001.

Indirectly Treated vs Untreated

We *conduct* a Wilcoxon test for post-EGRRCPA variables, and they can be seen in Table 4. There appears to be no statistical significance when it comes to ROA *difference*. The ROE difference, however, is highly statistically different. *Untreated* banks can provide higher returns to their shareholders. *Untreated* banks have significantly higher leverage ratios than *Indirectly Treated* banks;

this could be a sign that *Untreated* banks rely more on debt financing. *Untreated* banks have the highest median leverage ratio of the three groups *post-deregulation*; *fewer Untreated* banks crossed the threshold to *10 billion USD*, so the impact of regulatory burden, which would make banks more conservative, is less felt on *Untreated* banks. To support this, we find that *Treated* banks have significantly higher *Equity to Assets*, showing a more conservative capital structure. We will take a more in-depth *investigate* of the *Crosser* banks, banks that crossed the threshold in the net section of the paper.

Untreated banks have significantly more funding liabilities than *Indirectly Treated* banks. Just like *Indirectly Treated* banks have greater funding liabilities than *Treated* banks. The larger banks rely more on equity funding, and the smaller banks seem to rely more on debt funding for their lending. *Untreated* banks have significantly higher *Net Interest Income to Operating Income*, indicating that they rely more on income from interest activities.

This is enforced by the significant *difference* in the *Funding Liabilities to Assets* ratio, which is lower for *Indirectly Treated* banks. *Untreated* banks are more reliant on external debt financing. *Equity to Assets ratio* and *Tangible Assets to Total Assets Ratio* is significantly higher for *Indirectly Treated* banks.

To check how and *if* deregulation affects *Indirectly Treated* banks more as compared to *Untreated* banks, a *Difference in Difference* regression is conducted. The aim is to *see if the decision* to divide both below-threshold banks into *different* groups *instead* of lumping them together as below threshold reveals any *more* information.

Difference in Difference Regression Analysis:

Figure 9: Intergroup Difference in Difference

Source	DF	Type III SS	Mean Square	F Value	Pr>F
Untreated vs Treated					
Equity_Growth					
Source	DF	Type III SS	Mean Square	F Value	Pr>F
Untreated_Dummy	1	1.9584	1.9584	21.3	¡0.0001
Post_Deregulation_Du	1	0.3765	0.3765	4.1	0.0435
Untreated*Post_Dereg	1	2.3177	2.3177	25.21	¡0.0001
Deposit_Growth					
Source	DF	Type III SS	Mean Square	F Value	Pr>F

Source	DF	Type III SS	Mean Square	F Value	Pr>F
Untreated_Dummy	1	0.8349	0.8349	12.43	0.0005
Post_Deregulation_Du	1	1.5396	1.5396	22.91	¡.0001
Untreated*Post_Dereg	1	0.66662	0.66662	9.92	0.0017
Asset_Growth					
Source	DF	Type III SS	Mean Square	F Value	Pr>F
Untreated_Dummy	1	0.935	0.935	14.33	0.0002
Post_Deregulation_Du	1	1.06634	1.06634	16.35	¡.0001
Untreated*Post_Dereg	1	0.8217	0.8217	12.6	0.0004
Indirectly Treated vs Untreated					
ROA					
Source	DF	Type III SS	Mean Square	F Value	Pr>F
Indirectly_Treated_D	1	1.33E-06	1.33E-06	0.07	0.7934
Post_Deregulation_Du	1	0.00041	0.00041	21.12	¡0.0001
Indirect*Post_Dereg	1	5.96E-05	5.96E-05	3.07	0.0804
ROE					
Source	DF	Type III SS	Mean Square	F Value	Pr>F
Indirectly_Treated_D	1	0.007806	0.007806	4.08	0.0439
Post_Deregulation_Du	1	0.01726	0.01726	9.01	0.0032
Indirect*Post_Dereg	1	0.00806	0.00806	4.21	0.0406
Asset growth					
Source	DF	Type III SS	Mean Square	F Value	Pr>F
Indirectly_Treated_D	1	0.550207	0.550207	8.56	0.0036
Post_Deregulation_Du	1	3.935381	3.935381	61.2	¡.0001
Indirect*Post_Dereg	1	0.35054	0.35054	5.45	0.0196
Deposit Growth					
Indirectly_Treated_D	1	0.558015	0.558015	8.34	0.0004
Post_Deregulation_Du	1	4.413586	4.413586	65.93	¡0.0001
Indirect*Post_Dereg	1	0.383817	0.383817	5.73	0.0169

Source	DF	Type III SS	Mean Square	F Value	Pr>F
Equity Growth					
Indirectly_Treated_D	1	0.969707	0.969707	11.01	0.001
Post_Deregulation_Du	1	3.739964	3.739964	42.48	¡.0001
Indirect*Post_Dereg	1	0.766187	0.766187	8.7	0.0033
Indirectly Treated vs Treated					
Asset growth					
Indirectly_Treated_D	1	0.2031	0.203	2.75	0.098
Post_Deregulation_Du	1	0.3755	0.3755	5.09	0.0246
Indirect*Post_Dereg	1	0.2432	0.2432	3.3	0.0702
Equity Growth					
Indirectly_Treated_D	1	0.4634	0.4634	4.1	0.0435
Post_Deregulation_Du	1	0.0001	0.0001	0.09	0.9747
Indirect*Post_Dereg	1	0.7626	0.7626	6.75	0.0097

Note: This table presents Difference-in-Difference regression results comparing Untreated, Treated, and Indirectly Treated banks across multiple financial metrics post-deregulation.
The interaction term (e.g., *Group*Post_Dereg*) captures the differential effect of deregulation between groups. A "< 0.0001" indicates p-values less than 0.0001.

The Wilcoxon tests show the difference in key variables in each group, and they are different after EGRRCPA. To see if Deregulation impacted the groups differently, we run Difference in Difference regressions for pairs of groups.

Indirectly Treated vs Untreated

$$Y_{it} = \beta_0 + \beta_1 \text{Indirectly\_Treated}_i + \beta_2 \text{Post}_t + \beta_3 (\text{Indirectly\_Treated}_i \times \text{Post}_t) + \varepsilon_{it}$$

Where:

• Y_{it}*: Financial ratio (e.g., ROA, ROE, Leverage Ratio, etc.) for bank i in year t.*

• β_0*: Baseline financial ratio for Untreated banks before deregulation (control group).*

• $Indirectly\_Treated_i$*: Dummy variable (1 if Indirectly Treated bank, 0 if Untreated bank).*

• $Post_t$*: Dummy variable (1 if post-deregulation (2017 and beyond), 0 if Pre-Deregulation (2016 and earlier)).*

• $Indirectly\_Treated_i \times Post_t$*: Interaction term (DiD effect), capturing the differential impact of*

deregulation on Indirectly Treated banks relative to Untreated banks.

• β_1*: Baseline difference between Indirectly Treated and Untreated banks before deregulation.*

• β_2*: Change over time for Untreated banks (before vs. after deregulation).*

• β_3*: DiD coefficient (measures how much more or less the outcome changed for Indirectly Treated banks compared to Untreated banks after deregulation).*

• ε_{it}*: Error term.*

The difference in difference regression shows that ROA between the below threshold groups is not significantly different before EGRRCPA. However, after deregulation, the ROA grows significantly for both. Mean ROA grows marginally more for Indirectly Treated banks after deregulation, but this is only marginally significant with a p-value of 0.0804.

The DiD for ROE shows that Indirectly Treated banks have slightly higher ROE than Untreated banks before deregulation, but that deregulation increases ROE significantly for both groups. The interaction term is significant at the 5% level and shows that Indirectly Treated banks grow faster relative to Untreated banks. When looking at raw pre- and post-mean ROE, it may look like Untreated banks have a higher growth. But the difference in difference interaction term shows that after deregulation, the growth of ROE for Indirectly Treated banks is relatively higher than that for Untreated banks.

Asset growth, Deposit growth and Equity growth have very similar results. Indirectly Treated banks have lower growth rates in all three metrics compared to Untreated banks prior to deregulation. After EGRRCPA, all three metrics grow significantly for both groups. Indirectly Treated banks have statistically significant higher growth after deregulation relative to Untreated banks.

This is a critical finding. Our Difference in Difference regression shows conclusively that, despite both being below threshold groups, deregulation affects them statistically differently. This gives credence to Bindal et al (2018) and Bouwman et al (2019) criteria for grouping just below threshold and well below threshold banks separately, and it supports this paper's decision to use this grouping logic.

Untreated vs Treated

$$Y_{it} = \beta_0 + \beta_1 \text{Untreated}_i + \beta_2 \text{Post}_t + \beta_3 (\text{Untreated}_i \times \text{Post}_t) + \varepsilon_{it}$$

Where:

• Y_{it}*: Financial ratio (e.g., ROA, ROE, Leverage Ratio, etc.) for bank i in year t.*

• β_0*: Baseline financial ratio for Treated banks before deregulation (control group).*

• Untreated_i*: Dummy variable (1 if Untreated bank, 0 if Treated bank).*

• Post_t*: Dummy variable (1 if post-deregulation (2017 and beyond), 0 if pre-deregulation (2016 and earlier)).*

• $\text{Untreated}_i \times \text{Post}_t$*: Interaction term (DiD effect), capturing the differential impact of deregula-*

tion on Untreated banks relative to Treated banks.

• β_1*: Baseline difference between Untreated and Treated banks before deregulation.*

• β_2*: Change over time for Treated banks.*

• β_3*: DiD coefficient (how much more/less the outcome changed for Untreated banks).*

• ε_{it}*: Error term.*

The difference in Treated vs Untreated banks shows significance in the interaction term for only 3 variables. In figure 9 we can be seen that prior to deregulation Untreated banks have significantly lower equity growth in comparison to Treated banks. Post-deregulation, both groups have an increase in equity growth. However, Untreated banks have significantly more equity growth relative to Treated banks. This conclusively proves that Untreated banks are affected differently than Treated banks by EGRRCPA and grow their equity much faster.

Deposit growth is similar, Untreated banks have significantly lower deposit growth prior to deregulation. Deregulation improved the equity growth significantly for both banks, Untreated banks deposits grow faster than Treated banks, but the significance of this is very weak.

Asset Growth improves for both banks significantly after deregulation. Untreated banks grow their assets more slowly than Treated banks before deregulation, but after deregulation, Untreated banks grow much faster than Treated banks.

For robustness, the restricted Treated bank sample size, where no bank exceeded 13 billion USD, is also used to run the difference in difference regression. There is no significant difference in the results. The Wilcoxon and Difference in Difference tests show that while Deregulation impacted all three groups, the impact is not uniform.

Indirectly Treated vs Treated

$$Y_{it} = \beta_0 + \beta_1 \text{Indirectly\_Treated}_i + \beta_2 \text{Post}_t + \beta_3 (\text{Indirectly\_Treated}_i \times \text{Post}_t) + \varepsilon_{it}$$

Where:

• Y_{it}*: Financial ratio (e.g., ROA, ROE, Leverage Ratio, etc.) for bank i in year t.*

• β_0*: Baseline financial ratio for Treated banks before deregulation (control group).*

• *Indirectly_Treated*$_i$*: Dummy variable (1 if Indirectly Treated bank, 0 if Treated bank).*

• *Post*$_t$*: Dummy variable (1 if post-deregulation (2017 and beyond), 0 if Pre-Deregulation (2016 and earlier)).*

• *Indirectly_Treated*$_i \times$ *Post*$_t$*: Interaction term (DiD effect), capturing the differential impact of deregulation on Indirectly Treated banks relative to Treated banks.*

• β_1*: Baseline difference between Indirectly Treated and Treated banks before deregulation.*

• β_2*: Change over time for Treated banks (before vs. after deregulation).*

• β_3*: DiD coefficient (measures how much more or less the outcome changed for Indirectly Treated banks compared to Treated banks after deregulation).*

• ε_{it}*: Error term.*

Only two variables show significance for the interaction term. The mean asset growth for Indirectly Treated banks is almost stagnant prior to the deregulation period. After EGRRCPA, both Treated and Indirectly Treated banks experience an increase in asset growth. The growth for Indirectly Treated banks is much more pronounced. Deregulation has an observable different impact on asset growth for Indirectly Treated banks compared to Treated ones.

The passage of EGRRCA leads to increased equity growth for both groups, however as we find from figure 9, Indirectly Treated banks increase their equity growth significantly more than Treated banks.

Section-2 Hypothesis

From the intra group nonparametric Wilcoxon tests, we can observe statistically significant changes in the profitability, capital structure, operational efficiency, risk and growth metrics for Indirectly Treated and Untreated banks before and after the deregulation period. For Treated banks, all metrics barring the operational efficiency metrics changes are significant.

We can comfortably accept the hypothesis 2a.

H2a: *EGRRCPA will lead to significant changes in the profitability, growth, operational efficiency, risk strategy and capital structure for Untreated, Treated and Indirectly Treated banks.*

From the intergroup Wilcoxon test and intergroup Difference and Difference results we find that Indirectly Treated banks have significant differences in growth metrics in comparison to Untreated banks and Treated banks. All three groups of banks grow faster after the EGRRCPA, but the magnitude of growth in Indirectly Treated banks is higher. We can safely accept hypothesis H2b.

H2b: *Indirectly Treated banks will significantly change their growth metrics more than Untreated and Treated banks after deregulation*

The difference in difference results also clearly indicate that while Untreated banks have a more significant increase in profitability metrics compared to Indirectly Treated banks, the magnitude of the impact EGRRCPA has on these metrics is greater. The increased growth in Indirectly Treated banks comes with greater costs in terms of compliance.

H2c: *EGRRCPA will have a greater impact on the profitability of Indirectly Treated banks compared to Untreated banks*

Our results are inconclusive, and we cannot safely accept this hypothesis.

Section 3: Crosser Analysis

Figure 10: Crosser Summary Statistics

Variable	Pre Deregulation Indirectly Treated				Post Deregulation Indirectly Treated				Pre Deregulation Untreated				Post Deregulation Untreated			
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev
ROA	68	0.0097	0.0097	0.0025	166	0.0105	0.0112	0.0054	48	0.0093	0.0091	0.0031	120	0.0112	0.0114	0.0041
ROE	68	0.0859	0.0887	0.0215	166	0.0858	0.0895	0.0526	48	0.0887	0.0845	0.0307	120	0.0967	0.0940	0.0390
Net Int Income to Assets	68	0.0312	0.0306	0.0043	166	0.0300	0.0296	0.0038	48	0.0328	0.0318	0.0057	120	0.0312	0.0309	0.0054
Leverage Ratio	68	8.9976	8.3744	2.0145	166	8.4380	8.0279	2.1078	48	9.5304	9.3295	0.9986	120	8.6918	8.6722	1.5463
Equity to Assets	68	0.1153	0.1194	0.0194	166	0.1241	0.1246	0.0241	48	0.1060	0.1072	0.0108	120	0.1186	0.1153	0.0209
Total Capital Ratio	68	14.2422	13.7250	2.0628	162	14.6042	14.3800	1.6398	48	13.9221	13.4050	2.1187	118	14.7708	14.3550	2.3568
Tier1 Capital Ratio	68	12.7033	12.5700	2.4950	161	12.6330	12.3900	1.7506	48	12.0779	11.2800	2.5562	117	12.5506	11.9100	2.6492
Tangible Eq to Total Assets	68	0.0834	0.0818	0.0149	166	0.0828	0.0820	0.0129	48	0.0863	0.0863	0.0095	120	0.0887	0.0864	0.0126
Liabilities to Equity	68	7.9811	7.3744	1.9779	166	7.4241	7.0241	2.0781	48	8.5040	8.3295	0.9983	120	7.6823	7.6722	1.5396
Capital to Deposits	68	0.1484	0.1536	0.0288	166	0.1571	0.1560	0.0347	48	0.1391	0.1433	0.0190	120	0.1485	0.1440	0.0285
Deposits to Assets	68	0.7814	0.7901	0.0530	166	0.7956	0.7978	0.0461	48	0.7682	0.7865	0.0626	120	0.8021	0.8078	0.0395
Loan Loss Provision to Assets	68	0.0011	0.0009	0.0012	149	0.0014	0.0009	0.0021	48	0.0020	0.0013	0.0036	108	0.0019	0.0011	0.0029
Allowance Loss to Assets	68	0.0010	0.0009	0.0012	166	0.0014	0.0010	0.0020	48	0.0020	0.0013	0.0036	120	0.0019	0.0011	0.0028
Liabilities to Assets	68	0.8835	0.8806	0.0173	166	0.8747	0.8751	0.0229	48	0.8912	0.8906	0.0127	120	0.8804	0.8832	0.0207
Provisions to Net Income	68	0.1322	0.0899	0.4175	165	0.1383	0.0843	3.1752	48	-1.9935	0.0956	5.3861	120	-0.0962	0.0943	4.2047
Net Int Income to Op. Income	68	0.7534	0.7638	0.0812	166	0.7454	0.7540	0.0875	48	0.8011	0.7968	0.0922	120	0.8013	0.8043	0.0925
Diversification of Non-Int Income	68	0.2465	0.2062	0.0812	165	0.2354	0.2043	0.0875	48	0.1989	0.2032	0.0922	120	0.2013	0.1957	0.0925
Interest Dependence Ratio	68	0.6375	0.6445	0.1073	166	0.6402	0.6384	0.1125	48	0.6711	0.6639	0.1222	120	0.6632	0.6615	0.1185
Asset Growth	68	0.1481	0.0544	0.2630	165	0.1234	0.0567	0.2139	48	0.1481	0.0877	0.2630	120	0.1550	0.0661	0.1985
Equity Growth	68	0.1747	0.0705	0.3247	165	0.1245	0.0738	0.2330	48	0.1747	0.0992	0.3247	120	0.1756	0.0702	0.2340
Deposit Growth	68	0.1502	0.0667	0.2536	166	0.1198	0.0741	0.1987	48	0.1502	0.0992	0.2536	120	0.1550	0.0661	0.1985

Figure 11: Non Crosser Summary Statistics

Variable	Pre Deregulation Indirectly Treated				Post Deregulation Indirectly Treated				Pre Deregulation Untreated				Post Deregulation Untreated			
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev
ROA	19	0.0080	0.0078	0.0029	21	0.0093	0.0098	0.0055	82	0.0082	0.0093	0.0044	172	0.0107	0.0108	0.0044
ROE	19	0.0693	0.0692	0.0301	21	0.0849	0.0932	0.0475	82	0.0783	0.0878	0.0556	172	0.1033	0.1018	0.0412
Net Int Income to Assets	19	0.0312	0.0313	0.0031	21	0.0316	0.0329	0.0047	82	0.0287	0.0293	0.0062	172	0.0299	0.0300	0.0053
Leverage Ratio	19	8.6733	8.2069	1.4719	21	9.4830	9.2169	1.6358	82	9.9657	9.5447	2.6380	172	9.9421	9.3530	2.1888
Equity to Assets	19	0.1184	0.1218	0.0195	21	0.1083	0.1085	0.0175	82	0.1064	0.1048	0.0250	172	0.1048	0.1069	0.0199
Total Capital Ratio	19	13.5200	13.0300	1.9024	20	14.2015	14.1650	1.2954	82	14.5730	13.7450	3.0920	169	14.9035	14.6500	1.8825
Tier1 Capital Ratio	19	11.8832	11.3100	2.2478	20	12.1890	12.3150	1.0713	82	13.2356	12.8100	3.2345	168	13.1654	12.9550	2.1090
Tangible Eq to Total Assets	19	0.0914	0.0866	0.0169	21	0.0917	0.0900	0.0091	82	0.0907	0.0853	0.0252	172	0.0906	0.0888	0.0168
Liabilities to Equity	19	7.6654	7.2069	1.4795	21	8.4792	8.2169	1.6416	82	8.9605	8.5445	2.6363	172	8.9364	8.3529	2.1904
Capital to Deposits	19	0.1559	0.1538	0.0297	21	0.1375	0.1374	0.0203	82	0.1365	0.1282	0.0374	172	0.1296	0.1288	0.0280
Deposits to Assets	19	0.7642	0.7612	0.0535	21	0.7868	0.7939	0.0375	82	0.7900	0.7908	0.0716	172	0.8145	0.8227	0.0546
Loan Loss Provision to Assets	19	0.0020	0.0011	0.0036	19	0.0015	0.0007	0.0032	82	0.0012	0.0008	0.0025	157	0.0016	0.0009	0.0023
Allowance Loss to Assets	19	0.0020	0.0011	0.0036	21	0.0018	0.0010	0.0032	82	0.0012	0.0008	0.0025	172	0.0015	0.0009	0.0022
Funding Liabilities to Assets	19	0.8805	0.8782	0.0208	21	0.8912	0.8915	0.0184	82	0.8931	0.8947	0.0249	172	0.8946	0.8930	0.0202
Provisions to Net Income	19	0.7482	0.1399	2.4883	19	-2.5416	0.0307	11.8559	82	-0.5956	0.0937	7.3902	157	-0.1970	0.0942	5.1099
Net Int Income to Op Income	19	0.8249	0.8432	0.0500	21	0.7799	0.7886	0.0713	82	0.7799	0.7886	0.0713	172	0.8044	0.8159	0.1017
Diversification of Non Int income	19	0.1751	0.1568	0.0500	20	0.2201	0.2114	0.0713	82	0.2201	0.2114	0.0713	172	0.1956	0.1841	0.1017
Interest Dependence ratio	19	0.6052	0.6050	0.1190	21	0.5915	0.6431	0.1557	82	0.6381	0.6373	0.1916	172	0.6540	0.6450	0.1465
Asset Growth	19	-0.0207	0.0487	0.4713	21	0.0270	0.0094	0.0608	82	-0.1289	0.0543	0.3913	172	0.0679	0.0531	0.0783
Equity Growth	19	-0.0192	0.0405	0.4489	21	0.0571	0.0691	0.0787	81	-0.1296	0.0444	0.4054	172	0.0767	0.0695	0.1120
Deposit Growth	19	-0.0148	0.0428	0.5008	21	0.0320	0.0126	0.0777	82	-0.1382	0.0441	0.3901	172	0.0753	0.0576	0.0886

Crossers Vs Non-Crossers

For *Indirectly Treated banks*, 23 of the 30 banks in our study crossed the 10 billion USD threshold post-deregulation, and for the 45 *Untreated banks* in our study, 16 of them crossed the threshold post-deregulation.

In Figures 10 and 11, we provide detailed summary of statistics of the *Crosser* and *Non-Crosser* banks, for both groups, both pre- and post-deregulation.

Crosser vs Non-Crosser Difference in Difference

Figure 12: Crosser vs Non-Crosser Difference-in-Differences

ROE					
Source	**DF**	**Type III SS**	**Mean Sq**	**F Value**	**Pr ¿ F**
Crosser_Flag	1	0.002023	0.002023	1.06	0.3034
post_deregulation	1	0.027238	0.027238	14.28	0.0002
Crosser_F*post_dereg	1	0.015576	0.015576	8.17	0.0044
Group_2016	1	0.013215	0.013215	6.93	0.0087
Leverage Ratio					
Source	**DF**	**Type III SS**	**Mean Sq**	**F Value**	**Pr ¿ F**
Crosser_Flag	1	63.72901	63.72901	15.58	¡.0001
post_deregulation	1	10.83821	10.83821	2.65	0.104
Crosser_F*post_dereg	1	24.02496	24.02496	5.88	0.0156
Group_2016	1	28.39383	28.39383	6.94	0.008
Equity to Assets					
Source	**DF**	**Type III SS**	**Mean Sq**	**F Value**	**Pr ¿ F**
Crosser_Flag	1	0.005581	0.005581	12.4	0.0005
post_deregulation	1	0.002024	0.002024	4.5	0.0343
Crosser_F*post_dereg	1	0.006607	0.006607	14.68	0.0002
Group_2016	1	0.006035	0.006035	13.41	0.0003
Liabilities to Equity					
Source	**DF**	**Type III SS**	**Mean Sq**	**F Value**	**Pr ¿ F**
Crosser_Flag	1	65.61566	65.61566	16.23	¡.0001
post_deregulation	1	10.49363	10.49363	2.6	0.1076
Crosser_F*post_dereg	1	23.52993	23.52993	5.2	0.0161
Group_2016	1	28.42006	28.42006	7.03	0.0082
Capital to Deposits					
Source	**DF**	**Type III SS**	**Mean Sq**	**F Value**	**Pr ¿ F**
Crosser_Flag	1	0.010737	0.010737	11.57	0.0007
post_deregulation	1	6.2E-07	6.2E-07	0	0.9798
Crosser_F*post_dereg	1	0.011674	0.011674	12.58	0.0004
Group_2016	1	0.012956	0.012956	13.96	0.0003
Funding Liabilities to Assets					
Source	**DF**	**Type III SS**	**Mean Sq**	**F Value**	**Pr ¿ F**
Crosser_Flag	1	0.007289	0.007289	16.74	¡.0001
post_deregulation	1	0.001643	0.001643	3.7	0.0539
Crosser_F*post_dereg	1	0.005855	0.005855	13.15	0.0004
Group_2016	1	0.005736	0.005736	13.17	0.0003

Note. This table reports the Difference-in-Differences results comparing banks that crossed the $10 billion threshold ("Crossers") with those that did not ("Non-Crossers"). The interaction term *Crosser_F*post_dereg* captures the differential post-deregulation effects. Significant F-statistics indicate changes potentially driven by the EGRRCPA policy shift.

First, we conduct Crosser vs Non-Crosser difference in difference for Crosser and Non-Crosser banks, and the interaction term is *Crosser*Post-deregulation*. This paper aims to see how deregulation affects Crosser banks compared to Non-Crosser ones. We focus only on Untreated and Indirectly Treated banks.

From Figure 12, we find that for ROE, prior to deregulation, there is no statistical difference between Crossers and Non-Crossers. After deregulation, all banks increase their return on equity. After EGRRCPA, Crosser banks' ROE increases significantly more in comparison to ROE growth in non-Crosser banks. This proves conclusively that after deregulation, banks that crossed the 10 billion USD threshold are able to provide greater returns to their shareholder than they could have prior to deregulation. In absolute terms, ROE for Non-Crossers is higher post-deregulation, and the ROE of Non-Crossers increased relatively more than the ROE increase for Crossers due to the repeal.

The leverage ratio DiD model shows that even prior to deregulation, Crossers are statistically more leveraged than Non-Crossers. Deregulation does not lead to a statistically significant increase in leverage ratios for all banks. However, the interaction term is significant at the 5% level and shows that Crossers have a significantly bigger reaction in response to their leverage ratio relative to Non-Crossers. From our summary table, we find that Crossers significantly reduce their leverage ratios post-deregulation. Crossers may have deleveraged for compliance reasons.

The conservative capital structure shift of Crossers is further proven by the Equity to Assets DiD model. After deregulation, Crossers significantly increased their Equity to Assets, while Non-Crossers decreased theirs. The interaction term is significant, showing that the *Crosser* change in Equity to Assets relative to Non-Crosser is more pronounced.

The liability to equity model shows that prior to deregulation, Crossers had slightly lower liabilities to equity, and this is significant. Post-deregulation, Crossers reduced their Liabilities to Equity while Non-Crossers increased theirs. Post-deregulation impact is not statistically significant, but the interaction term is. This proves the deregulation impact is different in severity between Crosser and Non-Crosser, and this is statistically significant at the 5% level. Crosser's reduction in Liabilities to Equity is greater than expected in comparison to changes in Non-Crossers. This further provides credence to the finding that Crossers, post-deregulation, are more risk-averse.

Capital to Deposits for Crossers increases post-deregulation and decreases for Non-Crossers. Before deregulation, the change in Capital to Deposits is not statistically significant. Post-deregulation is also not statistically significant, but the interaction term *Crosser*post-deregulation* is. Crossers

changed their level of Capital to Deposits post-deregulation much more severely relative to changes in Non-Crossers. This shows that after deregulation, Crossers are concerned about raising their capital reserves, perhaps for compliance reasons.

The Liabilities to Assets model is also highly significant. Before deregulation the Liabilities to Equity Ratio is almost identical in both groups. After deregulation, Crossers reduced their reliance on market-based funding, whereas Non-Crossers slightly increased theirs. The interaction term is highly significant, indicating that post-deregulation impact on Crosser is more sensitive relative to the impact on Non-Crossers.

Overall, we find that deregulation and crossing made Crossers more risk-averse, and these banks create more robust capital structures and move away from market-based funding. The banks that stayed below 10 billion USD in assets expanded rapidly and started taking more risks. While EGRRCPA does remove certain regulatory burdens, the banks that cross this threshold still experience some costs. This, coupled with the fact that there are increased costs after expanding, especially if a bank undergoes acquisitions, can explain the slightly reduced profitability growth rate in crosser banks.

To understand further how Crossers and Non-Crossers behave, the paper breaks down the Crossers and Non-Crossers by their initial 2016 asset grouping and runs Wilcoxon and Difference in Difference tests on them.

Indirectly Treated Crosser vs Non-Crosser, Pre-deregulation

We conduct Wilcoxon tests between the *Crosser* and *Non-Crosser Indirectly Treated banks* pre-deregulation. *Crossers* have significantly higher *ROE* and *ROA* than *Non-Crosser* banks prior to deregulation and before crossing over the threshold. This confirms that banks that are performing better are able to cross over quickly to take advantage of the deregulation.

Based on the capital structure, we find that *Indirectly Treated Crossers* have greater leverage compared to *Non-Crossers* before deregulation. They later increased capital buffers, that we find in the *Crosser* vs *Non-Crosser* difference in difference, is likely a corrective measure.

Indirectly Treated Crossers prior to deregulation have a greater dependence on net interest income compared to Non-Crossers when generating their profits. Net Interest income to operating income is higher for *Non-Crossers*. However, the interest dependence ratio, which measures how much of a bank's Earnings before Income and Tax are due to Interest income, is higher for *Crossers*, albeit the significance is marginal at best. Diversification of noninterest income is also significantly higher for indirect *Crossers* compared to *Non-Crossers*.

Overall we find that prior to deregulation, the Indirectly Treated banks who would go on to cross the threshold have higher profitability, greater interest income efficiency, riskier capital struc-

ture and have more diversified sources of non-interest income, compared to the *Indirectly Treated* banks, that remained below the threshold for the duration of our data.

Indirectly Treated Crosser vs Non-Crosser, Post-deregulation

In Figure 13, we report the capital structure positions almost in reverses *post-deregulation*. The *Crossers* significantly reduce their leverage ratio in comparison to their own pre-deregulation figure *and in comparison to Non-Crossers*, who significantly raise theirs. *Equity to Assets, Capital to Deposits* ratios for indirectly *Crossers* are significantly higher than *Non-Crossers*. This shows that after EGRRCPA, the *Indirectly Treated* banks that crossed over are preparing their balance sheets to meet with increased compliance with crossing the threshold.

On the growth metrics, the banks that crossed the threshold had significant higher asset and deposit growth compared to *Non-Crossers*. This is logical as the deposit and asset growth allowed them to cross the threshold. The *Indirectly Treated Crossers* are better positioned in the *post-deregulation* environment to grow further and increase their profitability with a sound and risk-protected capital structure, compared to the banks that did not cross.

Figure 13: Intra Group Crosser vs Non-Crosser Pre and Post-deregulation Wilcoxon Results

Pre Deregulation Indirectly Treated Crosser vs Non Crosser			
Variables	**Crosser Median**	**Non Crosser Median**	**Wilcoxon P**
ROA	0.0097	0.0078	0.0245
ROE	0.0887	0.0692	0.0172
Tangible Equity to Total Assets	0.0818	0.0866	0.0441
Interest Dependence Ratio	0.6754	0.6500	0.0352
Net Int Income to Op Income	0.7488	0.8432	0.0005
Diversification of Non Int Income	0.2512	0.1568	0.0005

Pre Deregulation Untreated Crosser vs Non Crosser			
Variables	**Crosser Median**	**Non Crosser Median**	**Wilcoxon P**
Net Int Income to Assets	0.0318	0.0293	¡.0001
Tier1 Cap	11.2800	12.8100	0.0221
Loan Loss Provision to Assets	0.0013	0.0008	0.0225
Allowance Loss to Assets	0.0114	0.0126	0.0143
Net Int Income to Op Income	0.8338	0.7886	0.0510
Diversification of Non Int Income	0.1662	0.2114	0.0510

Post Deregulation Indirectly Treated Crosser vs Non Crosser			
Variables	**Crosser Median**	**Non Crosser Median**	**Wilcoxon P**
Leverage RatioI	8.0279	9.2169	0.0014
Equity to Assets	0.1246	0.1085	0.0014
Tangible Eq to toal Assets	0.0820	0.0900	0.0008
Liabilities to Assets	0.8751	0.8913	0.0004
Liabilities to Equity	7.0241	8.2169	0.0001
Capital to Deposits	0.1560	0.1374	0.0003
Interest Dependence Ratio	0.6676	0.6431	0.0655
Asset Growth	0.0591	0.0904	0.0012
Deposit Growth	0.0742	0.0126	0.0069

Post Deregulation Untreated Crosser vs Non Crosser			
Variables	**Crosser Median**	**Non Crosser Median**	**Wilcoxon P**
ROE	0.0940	0.1018	0.0423
Leverage Ratio	8.6722	9.3530	¡.0001
Equity to Assets	0.1153	0.1069	¡.0001
Tier1 Cap	11.9100	12.6900	0.0003
Liabilities to Assets	0.8832	0.8930	¡.0001
Deposits to Assets	0.8078	0.8420	0.0073
Liabilities to Equity	7.6722	8.3529	¡.0001
Capital to Deposits	0.1440	0.1288	¡.0001
Interest Dependence Ratio	0.6972	0.6450	0.0324
Asset Growth	0.0728	0.0531	0.0012
Equity Growth	0.0880	0.0695	0.0062
Deposit Growth	0.0889	0.0576	0.0015
Net Int Income to Op Income	0.8413	0.8195	0.0074
Diversification of Non Int Income	0.1587	0.1841	0.0074

Note: This table reports the results of Wilcoxon rank-sum tests comparing median values between Crosser and Non-Crosser banks within the Indirectly Treated and Untreated groups, both before and after deregulation. The Wilcoxon rank-sum test is a non-parametric method that does not assume normality and is used to assess whether the distributions of the two groups differ significantly. Reported are the group-specific medians and associated p-values. P-values below 0.05 indicate statistically significant differences in medians between Crosser and Non-Crosser banks. P-values reported as ¡ 0.0001 denote highly significant differences.

Figure 14: Indirectly Treated Crosser vs Non-Crosser Difference-in-Difference

Panel A: Means Comparison by Group and Period

	Pre Deregulation		Post Deregulation	
Variable	**Crosser**	**Non Crosser**	**Crosser**	**Non Crosser**
Leverage Ratio	8.9976	8.8783	8.4830	9.3481
Equity to Assets	0.1153	0.1184	0.1221	0.1083
Liabilities to Assets	0.8571	0.8710	0.8721	0.8870
Liabilities to Equity	7.9811	7.6078	8.1922	8.4792
Capital to Deposits	0.1536	0.1375	0.1567	0.1305
Net Int Income to Op Income	0.7767	0.7854	0.7891	0.7918
Diversification of Non Int Income	0.2431	0.1751	0.2159	0.2082
Provisions to Net Income	0.3267	0.7384	-2.5441	-2.5416

Panel B: Difference-in-Differences Regression Results

Variable	**Source**	**DF**	**F Value**	**Pr ¿ F**	**Type III SS**
Leverage Ratio	Crosser_Flag	1	1.0600	0.3050	4.2934
	post_deregulation	1	0.1300	0.7217	0.5169
	Crosser_F*post_dereg	1	3.8100	0.0519	15.4986
Equity to Assets	Crosser_Flag	1	2.7000	0.1012	0.0013
	post_deregulation	1	0.03	0.8714	0.0000
	Crosser_F*post_dereg	1	5.9000	0.0150	0.0030
Liabilities to Assets	Crosser_Flag	1	3.4000	0.0662	0.0015
	post_deregulation	1	0.07	0.7978	0.0000
	Crosser_F*post_dereg	1	6.9500	0.0088	0.0031
Liabilities to Equity	Crosser_Flag	1	1.1400	0.2860	4.5197
	post_deregulation	1	0.1400	0.7108	0.5451
	Crosser_F*post_dereg	1	3.9300	0.0485	15.5309
Capital to Deposits	Crosser_Flag	1	1.1700	0.2809	0.0012
	post_deregulation	1	0.76	0.3853	0.0008
	Crosser_F*post_dereg	1	5.8900	0.0159	0.0061
Net Int Income to Op Income	Crosser_Flag	1	5.2500	0.0227	0.0337
	post_deregulation	1	0.410	0.5221	0.0026
	Crosser_F*post_dereg	1	6.710	0.0111	0.0431
Diversification of Non Int Income	Crosser_Flag	1	5.2500	0.0227	0.0337
	post_deregulation	1	0.410	0.5221	0.0026
	Crosser_F*post_dereg	1	6.710	0.0111	0.0431
Provisions to Net Income	Crosser_Flag	1	3.7100	0.0761	33.5597
	post_deregulation	1	8.0600	0.0049	85.2159
	Crosser_F*post_dereg	1	8.1	0.0048	85.8657

Note: This figure presents the results of a difference-in-differences analysis comparing Indirectly Treated banks that crossed the $10 billion threshold ("Crossers") to those that did not ("Non-Crossers") before and after the passage of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA). Panel A shows mean values by group and period. Panel B displays regression results with interaction terms ('Crosser_F*post_dereg') capturing the DiD effect. Statistical significance is based on robust standard errors. A p-value less than 0.05 indicates statistically significant group-time interaction effects.

Indirectly Treated Crosser vs Non-Crosser Difference-in-Difference

From Figure 14, we find that, prior to deregulation, *Crosser* and *Non-Crosser Indirectly Treated* banks have no statistically significant difference in their leverage ratios. After deregulation, *Crossers* decreased their leverage ratio, while *Non-Crossers* increased theirs. The *Interaction term (DiD effect)* shows that deregulation impacted *Crossers* more; the change in the leverage ratio for *Crossers* is greater relative to the change in leverage ratio for *Non-Crossers*.

Provisions to Net Income for *Crossers* increase significantly and for *Non-Crossers* decrease significantly after deregulation, and the increase for *Crossers* is relatively greater than the decrease for *Non-Crossers*. *Capital to Deposits* for *Crossers* increase more after deregulation than the reduction in *Capital to Deposits* for *Non-Crossers*. *Liabilities to Equity* is significantly lower after deregulation for *Crossers* and higher for *Non-Crossers*. *Crossers* also significantly increase *Equity to Assets*, and *Non-Crossers* decrease theirs.

All of this shows that after deregulation, *Crossers* significantly become more conservative in their capital structure and in their provisions to compensate for additional risks. This is because *Crossers* have to deal with greater compliance of regulations after crossing the threshold.

Crossers and *Non-Crossers* have very similar dependence on external funding as is evident from their *Liabilities to Assets* ratio. After deregulation, *Crosser Indirectly Treated* banks significantly reduced their dependence on external funding and *Non-Crossers* increased theirs.

We also see a difference in their income structures due to deregulation. Prior to *EGRRCPA*, *Non-Crosser* banks depend on *net interest income* more than the *indirectly treated* banks which would cross the threshold. After deregulation, the *Crosser* banks slightly increase their *net interest income*, whereas *Non-Crossers* decrease theirs. The change after deregulation is relatively greater for *Crosser* banks. Therefore, we can safely say that *Non-Crosser* diversified more after deregulation. After deregulation, *Crosser* banks reduced their *diversification of non-interest income* relatively more than *Non-Crosser* banks increased theirs.

Untreated Banks Crosser vs Non-Crosser Pre-deregulation

As we find from Figure 14, prior to *EGRRCPA*, *Untreated* banks that crossed over the threshold have a significantly higher *Net Interest Income to Assets Ratio* than the *Untreated* banks that remained below the threshold. *Crossers* are able to generate more *net interest income* with their

assets than *Non-Crossers*. As evidenced by a marginally significant higher *Net Interest Income to Operating Income* ratio, *Crossers* are more dependent on interest earning activities. This is further shown by the marginal significance of the *Crossers'* weaker *non interest income diversification* compared to *Non-Crossers*.

Prior to deregulation, *Non-Crossers* have higher capital buffers than *Crossers*, as is evident by the statistically significant higher *tier 1 capital ratio*. *Crossers* had significantly higher *Loan Loss Provision to Assets* and *allowance for loss to assets*. This shows that prior to deregulation, *Crossers* are taking on more risks and preparing for potential losses due to their aggressive strategy.

The pre-deregulation Wilcoxon ratio results seem to indicate that *Crossers* are preparing for rapid expansion prior to deregulation.

Untreated Banks Crosser vs Non-Crosser Post-deregulation

From Figure 13, it is apparent that after deregulation, *Untreated* banks that crossed the threshold have significantly lower *ROE* than the ones that did not cross the threshold. Despite their rapid growth required to cross the threshold, their profitability relative to equity is lower than the *Untreated* banks, which did not grow as much.

Net interest Income to operating income is significantly higher for *Crosser* banks, indicating that they are more reliant on *interest-earning activities*. *Crossers* after deregulation have significantly lowered *leverage ratios* compared to *Non-Crossers* and have higher *Equity to Assets* and lower *liabilities to equity*. All of the signs point to them having a stronger and more conservative capital structure and liability reduction to ensure that they meet the compliance standards that come with reaching USD 10 billion in size. *Non-Crossers* increase their *leverage ratio* and are taking on more risk post-deregulation.

For the growth metrics, *Crosser* banks have significantly higher growth metrics post-deregulation as they needed to do so cross the threshold.

Untreated Crosser vs Non-Crosser Difference-in-Difference

$$Y_{it} = \beta_0 + \beta_1(\text{Crosser}_i) + \beta_2(\text{PostDereg}_t) + \beta_3(\text{Crosser}_i \times \text{PostDereg}_t) + \varepsilon_{it} \tag{1}$$

Where:

- Y_{it}: Outcome variable (e.g., ROA, ROE, NIM, Asset Growth, etc.) for bank i in year t.
- β_0: Baseline intercept (mean of Non-Crossers before deregulation).
- β_1: Difference between Crossers and Non-Crossers before deregulation.

- β_2: General change for all banks (Crossers & Non-Crossers) after deregulation.
- β_3: DiD effect $\rightarrow$ Additional change in Crossers after deregulation relative to Non-Crossers.
- ε_{it}: Error term capturing unexplained variation.

Figure 15: Untreated Crosser vs Non-Crosser Difference-in-Difference

Panel A: Means Comparison by Group and Period

	Pre Deregulation		Post Deregulation	
Variable	**Crosser**	**Non Crosser**	**Crosser**	**Non Crosser**
Net Int Income to Assets	0.0328	0.0287	0.0312	0.0299
Equity to Assets	0.1060	0.1064	0.1186	0.1048
Liabilities to Assets	0.8912	0.8931	0.8804	0.8946
Capital to Deposits	0.1391	0.1365	0.1485	0.1296

Panel B: Difference-in-Differences Regression Results

Variable	**Source**	**DF**	**F Value**	**Pr ¿ F**	**Type III SS**
Net Int Income to Assets	Crosser_Flag	1	14.6800	0.0001	60.2259
	post_deregulation	1	3.8400	0.0507	15.7563
	Crosser_F*post_dereg	1	3.4300	0.0647	14.0753
Equity to Assets	Crosser_Flag	1	9.1300	0.0027	0.0038
	post_deregulation	1	6.0400	0.0144	0.0025
	Crosser_F*post_dereg	1	10.260	0.015	0.0043
Funding Liabilities to Assets	Crosser_Flag	1	12.90	0.0004	0.0055
	post_deregulation	1	4.320	0.0383	0.0018
	Crosser_F*post_dereg	1	7.600	0.0061	0.0032
Capital to Deposits	Crosser_Flag	1	11.3400	0.0008	0.0098
	post_deregulation	1	0.1600	0.6917	0.0001
	Crosser_F*post_dereg	1	6.4400	0.0115	0.0056

Note: This figure presents the results of a difference-in-differences analysis comparing *Untreated* banks that crossed the $10 billion threshold ("Crossers") to those that did not ("Non-Crossers") before and after the passage of the *Economic Growth, Regulatory Relief, and Consumer Protection Act* (EGRRCPA). Panel A shows mean values by group and period. Panel B displays regression results with interaction terms (`Crosser_F*post_dereg`) capturing the DiD effect. Statistical significance is based on robust standard errors. A p-value less than 0.05 indicates statistically significant group-time interaction effects.

We find in Figure 15, *Crossers* have significantly higher *Net Interest Income to Assets* compared to *Non-Crossers* prior to deregulation, and after deregulation, the *Crossers'* net interest margins declined more than expected, although the significance is marginal.

For *Equity to Assets*, we find that there is little statistical difference prior to deregulation, but after the EGRRCPA, *Crosser Untreated* banks significantly increase their *Equity to Assets* ratio

relative to the changes in the same ratio of *Non-Crossers*. The changes to a more conservative capital structure can also be seen by the difference in findings in the *Capital to Deposits* ratio. *Crosser Untreated* banks increase their *Capital to Deposits* more after deregulation compared to the decrease in capital to deposit of *Non-Crosser Untreated* banks. This supports our previous findings, which show that *Crosser* banks are more conservative in their capital structure after deregulation.

Crosser Untreated banks reduced their *liabilities to assets* after *deregulation* and the change in *liabilities to assets* is greater relative to changes in *liabilities to assets* for Untreated banks. *Crossers* after EGRRCPA moved away from external funding and rely more on deposit based funding.

Indirectly Treated vs Untreated Crossers

The paper also investigates how *Indirectly Treated Crossers* behaved compared to *Untreated Crossers*.

$$Y_{it} = \beta_0 + \beta_1(Group_i) + \beta_2(PostDereg_t) + \beta_3(Group_i \times PostDereg_t) + \varepsilon_{it}$$

Where:

- Y_{it}: Dependent variable (ROA, ROE, NIM, Leverage Ratio, etc.).
- β_0: Intercept (mean value of Y for Untreated Crossers before deregulation).
- β_1: Effect of Group (Difference between Indirectly Treated and Untreated Crossers before deregulation).
- β_2: Effect of Post-Deregulation (Change in outcome for Untreated Crossers after deregulation).
- β_3: Interaction Term (Group × Post_Deregulation) → Difference-in-Differences (DiD) effect. Measures the additional change for Indirectly Treated Crossers relative to Untreated Crossers after deregulation.
- ε_{it}: Error term (random variation).

Both groups are below the threshold, and both groups of Crossers have to grow their assets to cross to take advantage of the reduced regulations.

From Figure 16 it is apparent that all three growth metrics are statistically significant. *Asset Growth, Deposit Growth and Equity Growth* are to be highly statistically significant.

The interaction terms group*Post-deregulation are significant for all three groups. This is evident in the Figure 16.

Figure 16: Indirectly Treated vs Untreated Crosser Difference-in-Difference

Panel A: Means Comparison by Group and Period

	Pre Deregulation		Post Deregulation	
Variable	**Indirectly Treated**	**Untreated**	**Indirectly Treated**	**Untreated**
Asset Growth	0.0020	-0.0898	0.1243	0.1481
Equity Growth	0.0539	-0.0976	0.1353	0.1757
Deposit Growth	-0.0024	-0.0871	0.1297	0.1550

Panel B: Difference-in-Differences Regression Results

Variable	**Source**	**DF**	**F Value**	**Pr ¿ F**	**Type III SS**
Asset Growth	Group_2016	1	1.4000	0.2372	0.0925
	post_deregulation	1	39.3800	¡.0001	2.6008
	Group_201*post_dereg	1	4.5400	0.0447	0.2678
Equity Growth	Group_2016	1	2.4100	0.1211	0.2479
	post_deregulation	1	24.5600	¡.0001	2.5220
	Group_201*post_dereg	1	7.1900	0.0076	0.7382
Deposit Growth	Group_2016	1	1.0300	0.3171	0.0707
	post_deregulation	1	40.9200	¡.0001	2.8079
	Group_201*post_dereg	1	5.3400	0.0607	0.2428

Note: This figure presents the results of a difference-in-differences analysis comparing *Indirectly Treated* banks that crossed the $10 billion threshold ("Crossers") to *Untreated* banks that also crossed the threshold. Panel A shows mean values by group and period. Panel B displays regression results with interaction terms (`Group_201*post_dereg`) capturing the DiD effect. Statistical significance is based on robust standard errors. A p-value less than 0.05 indicates statistically significant group-time interaction effects.

Asset Growth-The Group effect is not significant, the post-deregulation effect is strongly significant, and the group*post-deregulation is significant, which highlights that asset growth between *Untreated* and *Indirectly Treated Crossers* is not that different before deregulation, but after deregulation, both groups have increased. *Untreated Treated Crossers* have an even higher asset growth when compared to *Indirectly Crossers*. This is an important finding. Prior to empirical studies, an assumption could have been that *Untreated* banks that crossed would have higher asset growth as they needed to grow more to cross the threshold. Our study proves that assumption.

Equity growth-Similar to asset growth, the post-deregulation effect is strongly significant, the group effect is not significant, and the interaction effect is significant. Pre-deregulation, there is no statistically significant difference in the equity growth of *Untreated* and *Indirectly Treated Crosser* banks, but after deregulation, both groups grow their equity more, with *Untreated Crossers* unlocking even more equity potential.

Deposit growth-Post-deregulation effect is strongly significant, group effect is not significant and interaction effect is marginally significant. Unlike asset growth and equity growth, the effect is not

as pronounced. While *Unreated Crossers* grow their deposits more than their *Indirectly treated* counterparts post-deregulation, it is not as pronounced as asset and equity growth.

Section-3 Hypothesis

The Wilcoxon and Difference in Difference results show that while *Crossers* and *Non-Crosser* banks from the *Indirectly Treated* and *Untreated* groups of banks are affected by the passing of EGRRCPA, the impacts are not the same. *Indirectly Treated* banks have nine metrics that are significantly impacted by deregulation, and *Untreated* banks have four significant metrics. For both *Indirectly Treated Crosser* banks and *Untreated Crosser* banks, substantially reduce their leverage metrics. Post-deregulation, both groups of *Crossers* significantly increase their *Capital to Deposits* and reduce their *Funding Liabilities to Assets* metrics, whereas their *Non-Crosser* counterparts do the exact opposite. These changes ensure that the *Crosser* banks are compliant with the regulations that come with crossing the threshold. We can safely accept hypothesis **H3a**

H3a: *Crosser* banks will show significant conservative changes to capital structure and risk metrics post-deregulation compared to *Non-Crosser* banks.

From the results, it is clear that the EGRRCPA has a greater impact on the growth metrics of *Untreated Crossers* compared to *Indirectly* banks, due the fact that *Untreated Crossers* have to grow more to cross the threshold. We can safely accept hypothesis **H3b**.

H3b: *EGRRCPA will have a greater impact on the growth metrics of Untreated Crosser compared to Indirectly Treated Crossers.*

Section 4: Merger and Acquisitions

This paper explores in detail the *Mergers and Acquisition* changes brought about by deregulation. We have shown in our paper so far that *EGRRCPA* is a major factor in banks increasing their growth and crossing the 10 billion USD threshold. We will now investigate how many of the banks use *Mergers and Acquisitions* to make the jump from below 10 billion to post 10 Billion. The paper attempts to investigate if *Untreated* banks (those with assets between 4-7 billion USD) or *Indirectly Treated* banks (those with assets from 7 billion to just below 10 billion) undergo more M&As.

The general assumption would be that *Indirectly Treated* banks being much closer to the threshold could simply cross over the threshold organically without requiring to make any acquisitions. Whereas *Untreated* banks, being farther away from the threshold would be more likely to need

acquisitions to cross over.

From the RSSID-CRSP-Compustat-SDC linking path table, the paper connects the various banking groups and their *Merger and Acquisition* activities.

Impact of Deregulation on Below Threshold Banks Merger and Acquisition Behaviour

To see if deregulation impacted acquisition rates among below threshold banks and to check how deregulation impacts acquisitions across groups, we run a Poisson regression Model.

$$\log(E[Nr\_Acq]) = \beta_0 + \beta_1 \cdot PostEGRRCPA + \beta_2 \cdot COVID\_Dummy + \beta_3 \cdot group + \beta_4 \cdot (PostEGRRCPA \times group) + \ldots$$

Where:

- $E[Nr\_Acq]$: The expected number of M&A acquisitions for a bank.
- β_0: The intercept (baseline log count of M&As for Untreated banks pre-EGRRCPA and pre-COVID).
- β_1 (*PostEGRRCPA*): Change in the log of expected acquisitions after deregulation (EGRRCPA).
- β_2 (*COVID_Dummy*): Effect of the COVID period (2020–2021) on M&A activity.
- β_3 (group (*Indirectly Treated*)): Difference in M&A activity between *Indirectly Treated* banks and *Untreated* banks (reference group).
- β_4 (*PostEGRRCPA* $\times$ group): Interaction term capturing the effect of deregulation on *Indirectly Treated* banks relative to *Untreated* banks.
- β_5 (*COVID_Dummy* $\times$ group): Interaction term capturing the impact of COVID on *Indirectly Treated* banks relative to *Untreated* banks.
- β_6 (*Log_Assets*): Effect of bank size (log of total assets) on M&A activity.
- β_7 (Log_Assets^2): Quadratic term allowing for nonlinear effects of bank size on acquisitions.
- β_8 (*ROA*): Impact of profitability on M&A likelihood.
- β_9 (*Capital_Ratio*): Effect of capital adequacy on M&A likelihood.
- β_{10} (*Non_Int_Income_assets*): Influence of non-interest income on M&A decisions.

Figure 17: Poisson Regression Results

Panel A: Criteria for Assessing Goodness of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Deviance	678	325.5346	0.4801
Scaled Deviance	678	325.5346	0.4801
Pearson Chi-Square	678	550.002	0.8112
Scaled Pearson X2	678	550.002	0.8112

Panel B: Maximum Likelihood Parameter Estimates							
Parameter	**Group**	**DF**	**Estimate**	**Std. Error**	**Wald 95% CI**	**Wald χ^2**	**Pr $>\chi^2$**
Intercept	–	1	81.4662	13.4906	[55.0252, 107.9072]	36.47	$<$ .0001
PostEGRRCPA	–	1	3.4698	0.2722	[2.9364, 4.0032]	162.54	$<$ .0001
COVID_Dummy	–	1	0.1823	0.3887	[-0.5795, 0.9441]	0.22	0.639
group	Indirectly Treated	1	2.2293	0.2759	[1.6884, 2.7701]	65.27	$<$ .0001
PostEGRRCPA*group	Indirectly Treated	1	-1.4989	0.3138	[-2.1139, -0.8838]	22.82	$<$ .0001
COVID_Dummy*group	Indirectly Treated	1	-0.2301	0.4714	[-1.155, 0.693]	0.24	0.6241
Log_Assets	–	1	-17.3351	2.9624	[-23.1413, -11.5289]	34.24	$<$ .0001
Log_Assets*Log_Assets	–	1	0.8641	0.1616	[0.5473, 1.1809]	28.58	$<$ .0001
ROA	–	1	17.5734	18.1346	[-18.3424, 53.471]	0.92	0.3373
Capital_Ratio	–	1	2.2282	3.731	[-5.0843, 9.5408]	0.36	0.5504
Diversification of Non Int Income	–	1	36.253	14.6827	[7.6535, 64.9971]	6.17	0.013
Scale	–	0	1	0	[1, 1]	–	–

Note: This table reports the results from a Poisson regression examining the determinants of bank acquisition likelihood. Panel A summarizes goodness-of-fit statistics. Panel B displays the maximum likelihood parameter estimates, including interaction terms for post-deregulation and COVID effects, as well as key bank characteristics such as size, profitability, and diversification. A p-value (Pr ¿χ^2) below 0.05 indicates statistical significance.

The results can be seen in figure 17. Post EGRRCPA is highly significant with a $p<0.0001$. Banks have a highly significant increase in acquisition rate post-deregulation. This proves that deregulation based on asset size, increases acquisitions for banks.

A *covid dummy* is included to check if the pandemic affected acquisition rates for below the threshold banks, our *covid dummy* is insignificant. Therefore, we can conclusively say that *covid* did not impact our post-deregulation analysis of *Merger and acquisition rates*.

Indirectly Treated variable has statistically significant and showed that *Indirectly Treated* banks have a higher rate of acquisition compared to *Untreated* banks. The interaction term *Post-EGRRCPA*Indirectly Treated* was highly significant but negative. This shows that after deregulation, the rate of increase of *M&A activities* is higher in *Untreated* banks. This proves two things. First deregulation impacts the *M&A rate* of *Indirectly Treated* and *Untreated* banks differently and secondly confirms the logic that *Untreated* banks being farther away from crossing, have to increase their pre-deregulation *M&A rate* faster post-deregulation to grow and cross the threshold as quickly as possible.

From the financial variables, *log assets* are negative but significant, showing that larger banks acquire fewer targets. However, $log(assets)^2$ is positive and also highly significant, indicating that the largest banks acquire more. This means that banks closest to the threshold acquire more to grow faster and more aggressively to better take advantage of the economies of scale post-deregulation. Banks with higher *diversification of noninterest income ratio* are more likely to acquire, indicating that banks with more diversified income sources acquire more.

Indirectly Treated banks acquire more, but *Untreated* banks grow their acquisitions relatively rate faster than *Indirectly Treated* banks post-deregulation. This is a crucial finding as this confirms that the two below threshold groups are affected differently by deregulation. We will check how much more likely an *Indirectly Treated* bank is to acquire compared to an *Untreated* bank.

For *Robustness*, the paper recreates the test with a *negative Binomial model* and the results are exactly the same.

The tests prove that while both groups *M&A rate* are impacted by *EGRRCPA*. It is *Untreated* banks who have a greater relative change in their *M&A rate*. This further proves that there is a distinct difference between *Indirectly Treated* and *Untreated* banks.

Likelihood of Merger and Acquisition

A Logistic regression model is utilized to see which group has a greater tendency to conduct M&As

$$\log\left(\frac{P(Acq\_Dummy=1)}{1-P(Acq\_Dummy=1)}\right) = \beta_0+\beta_1(at)+\beta_2(Leverage\_Ratio)+\beta_3(Total\_Capital\_Ratio)$$
$$+\beta_4(Deposit\_Growth)+\beta_6(Indirectly\_Treated\_Dummy)$$
$$+\beta_5(Asset\_Growth)+\beta_7(COVID\_Dummy)+$$
$$\beta_8(Group\_2016\_COVID\_Interaction)$$

Where:

- *P(Acq_Dummy=1)*: The probability that a bank engages in an M&A.
- β_0: The intercept.
- β_1 *to* β_7: The coefficients estimated in the regression.
- The right-hand side consists of the independent variables that influence the probability of engaging in M&A:
  - *Leverage Ratio*: Financial leverage of the bank.
  - *Total Capital Ratio*: A measure of capital adequacy.
  - *Deposit Growth*: Growth in deposits.
  - *Asset Growth*: Growth in total assets.
  - *Indirectly Treated Dummy*: 1 if the bank is Indirectly Treated, 0 otherwise.
  - *COVID Dummy*: 1 for the years 2020-2021, 0 otherwise.
  - *Group_2016_COVID_Interaction*: Interaction term between indirect treatment and COVID.

From Figure 18, the likelihood Ratio Chi-Square: 61.3925, *P¡0.0001*, the model is statistically significant. The Wald test Chi-Square is also highly significant.
From the variables, the group variable to check whether *Indirectly Treated* or *Untreated* banks are more likely to acquire is highly significant and it give us an odds ratio of 2.89. Proving conclusively that *Indirectly Treated* banks are almost 3 times as likely as an *Untreated* bank to undergo a merger or acquisition.
Covid dummy is not statistically significant, but it does have an odds ratio of 0.465. It shows that during covid, there is a lower likelihood of M&A. The interaction term between *Indirectly Treated* and *Covid* is not significant.
Of the financial variables, only *Leverage ratio* is statistically significant and showed that banks with a higher leverage are less like to conduct an M&A.

Figure 18: Logistic regression for the likelihood of MA

Panel A: Odds Ratio Estimates and Wald Confidence Intervals			
Odds Ratio	**Estimate**	**Lower 95% CL**	**Upper 95% CL**
Indirectly_Treated_Dummy	2.888	1.854	4.498
COVID_Dummy 1 vs 0	0.465	0.186	1.161
Group_2016_COVID_Interaction	1.856	0.598	5.755
Panel B: Analysis of Maximum Likelihood Estimates			
Intercept	1	1.3014	1.0568
5.165 / 0.2182			
Asset	1	-0.00004	0.000021
4.3114 / 0.0379			
Leverage Ratio	1	-0.2246	0.0608
13.651 / 0.0002			
Total Capital Ratio	1	-0.0359	0.0497
0.5215 / 0.4702			
Deposit Growth	1	1.3064	2.0651
0.4002 / 0.5270			
Asset Growth	1	-0.9165	2.0964
0.1911 / 0.6620			
Indirectly Treated_D	1	1.0605	0.2260
22.0105 / <0.0001			
COVID_Dummy	1	-0.7664	0.4672
2.6905 / 0.1009			
Group_2016_COVID_Int	1	0.6182	0.5775
1.1459 / 0.2844			

Note: This table presents the results from a logistic regression analyzing the likelihood of a bank engaging in a merger or acquisition. Panel A provides odds ratios and confidence intervals. Panel B displays the maximum likelihood estimates and significance levels. A P-value ($\Pr > \chi^2$) below 0.05 indicates statistical significance.

Effect of Mergers and Acquisitions on Speed of Crossing Threshold

Figure 19: Years to Cross Threshold — Kaplan-Meier Survival Analysis

Obs	**STRATUM**	**Group**	**MA Before 10B**	**Mean**	**Standard Error**
1	1	Indirectly Treated	0	4.35714	0.29193
2	2	Indirectly Treated	1	4.19903	0.08770
3	3	Untreated	0	6.83333	0.18075

Note: This table reports the average number of years it took banks to cross the $10B asset threshold, based on Kaplan-Meier survival analysis. *MA Before 10B* indicates whether the bank engaged in a merger or acquisition before crossing. Observations are stratified by treatment group and M&A status. A lower mean indicates faster crossing of the threshold.

While the logistic regression model showed that *Indirectly Treated* banks are more likely to conduct a M&A. We wanted to dig in further. From the analysis we find that 23 *Indirectly Treated* banks

and 16 *Untreated* banks crossed the threshold over to 10 billion USD. The paper aims to further check if using M&A helped the banks cross the 10Billion threshold faster than the banks that did not engage in M&A.

Kaplan-Meier Survival Analysis of banks crossing the threshold is used to check if M&A helps the banks cross the threshold.

$$\hat{S}(t) = \prod_{t_i \leq t} \left(1 - \frac{d_i}{n_i}\right)$$

We find that, on average, if an *Indirectly Treated* bank has an M&A before crossing the threshold, it takes it 4.19 years to cross the threshold, and it takes 4.36 years without one. However, this does not say much about the power of M&A to cross the threshold since of the twenty three *Indirectly Treated* banks to cross over, only three do not conduct an M&A before crossing. For *Untreated* banks, we find that it takes an *Untreated* bank only slightly longer to cross the threshold if it does not conducted an M&A prior to crossing.

Section-4 Hypothesis

From the Poisson regression and logistic regression models, it is clear that the passing of the EGRRCPA leads to an increase in M&A for both *Indirectly Treated* and *Untreated* banks. We can safely accept the hypothesis H4a.

H4a: Deregulation has a significant positive impact on the M&A rate of below the threshold banks

The Poisson regression results indicate that following the passage of EGRRCPA, *Untreated* banks' Merger and Acquisition rates increased relative to the rate for *Indirectly Treated* banks.

We can safely accept hypothesis H4b.

H4b: EGRRCPA leads to a greater increase in M&A rates for *Untreated* banks relative to *Indirectly Treated* banks.

The Kaplan-Meier Survival analysis indicates that there is a slight increase in the pace at which *Crosser* banks cross the threshold when they undergo M&A, compared to *Crosser* banks that do not undergo M&A. However, the number of *Indirectly Treated* banks that crossed the threshold and did not take part in mergers and Acquisitions is too low to draw a strong conclusion for that group. We can partially accept hypothesis H4c, and say that Mergers and Acquisitions helped *Untreated Crosser* banks cross the threshold marginally faster than *Untreated* banks that did not take part in M&A.

H4c: M&A helps below threshold banks cross USD 10 billion faster than banks that do not undergo

mergers and acquisitions

Limitations and Future Research

While this thesis provides robust evidence, the number of *Treated* banks, even when expanded, is only 12. This may affect the statistical power of the inferences. Further extension would be to investigate how loan pricing, credit risk, and customer outcomes evolved in the post-EGRRCPA era, offering a more granular view of how deregulation affects communities and credit access.

Conclusion

This thesis provides a comprehensive analysis of how mid-sized U.S banks responded to the partial repeal of Dodd-Frank regulatory burdens under the Economic Growth, Regulatory Relief and Consumer Protection Act (EGRRCPA). The paper focuses on the 10 billion USD asset threshold. The paper employs a multi-layered empirical strategy—including event studies, Wilcoxon rank-sum tests, difference-in-differences regressions, and M&A survival analysis—to uncover how a deregulation impacts profitability, risk-taking, growth, and acquisition activity among different bank categories.

The findings reveal that EGRRCPA has a significant and varied impact on banks based on their pre-deregulation asset size. The event study results showed that *Indirectly Treated* banks (banks whose asset size is just below the 10 billion USD threshold) have the most pronounced abnormal market reactions around key EGRRCPA event dates, proving that investors are correct in their assumption that banks in this asset group would be most affected by the regulatory changes in EGRRCPA.

Post-deregulation, *Indirectly Treated* banks significantly accelerate asset, equity, and deposit growth compared to *Untreated* smaller banks, with difference-in-differences regressions confirming statistically significant interaction effects. These banks also adjust their capital structure, reducing leverage and increasing equity buffers, suggesting strategic preparation for operating above the $10 billion threshold. By contrast, *Untreated* banks (well below $10 billion) remain more leveraged and focused on improving profitability rather than regulatory repositioning.

The *Crossers vs Non-Crossers* analysis adds a new dimension, showing that banks which crossed the 10 billion USD threshold after deregulation exhibit stronger financial performance pre-deregulation

and became more conservative after crossing. This implies an almost Darwinian self-selection method, where only the most capable banks pursue growth and do so responsibly after changes in regulations.

The M&A analysis shows how EGRRCPA leads to an M&A wave among below the threshold banks. The number of acquisitions rises significantly post-deregulation, especially among *Untreated* banks seeking to grow via consolidation. Poisson regressions and survival analysis confirm that M&A plays a key role in helping banks cross the 10 billion USD threshold. Although organic *Crossers* exist, crossing is faster for banks that undergo M&As, and the vast majority of *Crossers* do so. This highlights that size-based regulatory changes influence strategic decisions like M&As.

Overall, this study contributes to the banking and regulatory literature by exploring in depth the impact of asset-based deregulation on banks below the asset thresholds. Just as banks slow growth to avoid crossing a costly threshold, they accelerate growth when those burdens are reduced.

Policy Implications

The findings suggest that hard regulatory thresholds like the $10 billion mark can significantly distort bank behaviour. When these thresholds are removed or softened, banks quickly adjust by expanding, merging, or changing capital strategies. The experience of EGRRCPA shows that regulatory relief can stimulate growth but also triggers significant structural changes in the banking sector that warrant close monitoring.

References

Academic Literature

- Barth, J. R., Caprio Jr., G., & Levine, R. (2002).
  Bank Regulation and Supervision: What Works Best?
  NBER Working Paper No. 9323.

- Barth, J. R., Dopico, L. G., Nolle, D. E., & Wilcox, J. A. (2004).
  An International Comparison and Assessment of the Structure of Bank Supervision.
  Federal Reserve Bank of Chicago.

- Binder, J. J. (1998).
  The Event Study Methodology Since 1969.
  Review of Quantitative Finance and Accounting, 11(2), 111–137.

- Bindal, A., Bouwman, C. H. S., Hu, S., & Johnson, S. A. (2020).
  Bank regulatory size thresholds, merger and acquisition behavior, and small business lending.
  Journal of Corporate Finance, 62, 101590.

- Black, B. S., & Khanna, V. S. (2007).
  Can Corporate Governance Reforms Increase Firms' Market Values? Evidence from India.
  Journal of Empirical Legal Studies, 4(4), 749–796.

- Blacconiere, W. G., & Northcut, W. D. (1997).
  Environmental information and market reactions to environmental legislation.
  Journal of Accounting, Auditing & Finance, 12(2), 149–178.

- Bouwman, C. H. S., Hu, S., & Johnson, S. A. (2018).
  Differential bank behaviors around the Dodd–Frank Act size thresholds.
  Journal of Financial Intermediation, 34, 47–57.

- Campello, M., & Matta, R. (2019).
  Asset Liquidity and Capital Structure.
  ResearchGate.

- Chen, A. H., & Sanger, G. C. (1985).
  An analysis of the impact of regulatory change: The case of natural gas deregulation.
  Financial Review, 20(1), 36–53.

- Erkens, M. H. R., & Gan, Y. (2022).
  Rolling Back Dodd-Frank: Investors' and Banks' Responses to Financial Market Deregulation.
  SSRN Electronic Journal.

- Lamdin, D. J. (2001).
  Implementing and interpreting event studies of regulatory changes.
  Journal of Economics and Business, 53(2–3), 171–183.

- Noam, E. M. (1993).
  Assessing the Impacts of Divestiture and Deregulation in Telecommunications.
  Columbia Institute for Tele-Information.

- Ovtchinnikov, A. V. (2013).
  Merger waves following industry deregulation.
  Journal of Corporate Finance, 21, 51–76.

- Pasiouras, F., Tanna, S., & Zopounidis, C. (2009).
  The impact of banking regulations on banks' cost and profit efficiency: Cross-country evidence.
  International Review of Financial Analysis, 18(5), 294–302.

- Srivastav, A., & Vallascas, F. (2019).
  Is there a Benefit from Reduced Regulation on Small Banks?
  Community Banking Research Conference.

Government and Legal Documents

- Federal Register. (2017, February 8). *Core Principles for Regulating the United States Financial System.*
  https://www.federalregister.gov/documents/2017/02/08/2017-02762/core-principles-for

- U.S. Congress. (2017). *Financial CHOICE Act of 2017, H.R.10, 115th Congress. Congress.gov.*
  https://www.congress.gov/bill/115th-congress/house-bill/10

- U.S. Congress. (2018). *Economic Growth, Regulatory Relief, and Consumer Protection Act, S.2155, 115th Congress. Congress.gov.*
  https://www.congress.gov/bill/115th-congress/senate-bill/2155

- U.S. Senate Committee on Banking, Housing, and Urban Affairs. (2017, December 5). *Banking Committee Advances S.2155, The Economic Growth, Regulatory Relief and Consumer Protection Act.* https://www.banking.senate.gov/newsroom/majority/banking-committee-advances-s-2155-

- U.S. Congress. (2018, March 6). *Congressional Record, Senate Section, Volume 164, Issue 38, Page S1341. Congress.gov.* https://www.congress.gov/congressional-record/volume-164/issue-38/senate-section/page/S1341

News Articles

- House, B., & Wasson, E. (2016, July 18). *Republican platform under Trump backs Glass-Steagall's return. Bloomberg.* https://www.bloomberg.com/politics/articles/2016-07-18/republican-platform-under-tr

- Paletta, D., & Timiraos, N. (2016, June 7). *Donald Trump, Jeb Hensarling meet on Dodd-Frank alternative. The Wall Street Journal.* https://www.wsj.com/articles/donald-trump-jeb-hensarling-meet-on-dodd-frank-alterna

Appendix

			Event Window	Event Window	Event Window	Event Window
		N Obs	-1,+1	-1,+2	-1,+1	-1,+2
	Early Political and Policy Signs		Mean CAR	Mean CAR	Patell Z	Patell Z
07/06/2016	Indirectly Treated	28	0.0006	-0.0062***	-0.18268	-2.49828 **
	Treated	6	0.0031	-0.0015	0.069186	-0.44475
	Untreated	40	0.0037	-0.0012	0.648958	-1.89328 *
18/07/2016	Indirectly Treated	28	-0.0076***	-0.0171***	-0.32027	-3.10367 ***
	Treated	6	-0.0067**	-0.0110***	0.064863	-0.74605
	Untreated	40	-0.0037**	-0.0124***	0.030667	-2.95268 ***
	Executive order and Early Legislation Phase					
03/02/2017	Indirectly Treated	28	-0.0018	-0.0018	-2.60825 ***	-3.61027 ***
	Treated	6	-0.0076	-0.0076	-0.68905	-0.99379
	Untreated	40	-0.0010	-0.0010	-2.36479 **	-4.16775 ***
26/04/2017	Indirectly Treated	27	-0.0062	-0.0227***	-1.42912	-4.03786 ***
	Treated	6	0.0028	-0.0174	-0.46576	-2.17861 **
	Untreated	39	-0.0078*	-0.0151	-3.55939 ***	-6.08518 ***
	Legislative Momentum Phase					
08/06/2017	Indirectly Treated	27	0.0773***	0.0773***	15.7871 ***	10.0288 ***
	Treated	6	0.0927***	0.0927***	7.706694 ***	4.657873 ***
	Untreated	39	0.0740***	0.0740***	26.00631 ***	11.93077 ***
16/11/2017	Indirectly Treated	27	0.0056**	0.0056**	2.441882 **	3.688546 ***
	Treated	6	0.0151*	0.0151*	1.634262	1.995835 **
	Untreated	39	0.0092***	0.0092***	3.122851 ***	5.587045 ***
05/12/2017	Indirectly Treated	26	-0.0041	-0.0078**	-0.90384	-2.41983 **
	Treated	6	-0.0017	-0.0060	-0.27979	-0.77872
	Untreated	39	-0.0026	-0.0067	-2.06968 **	-3.31705 ***
07/03/2018	Indirectly Treated	26	0.0025*	0.0055***	0.642461	1.420564
	Treated	6	0.0023	0.0036	0.378715	0.543384
	Untreated	40	0.0014	0.0041*	0.623399	0.746578
14/03/2018	Indirectly Treated	26	0.0060***	0.0096***	2.537032 **	3.112262 ***
	Treated	6	0.0018	0.0066	0.261777	0.773703
	Untreated	40	0.0046***	0.0066***	2.231457 **	3.119251 ***
	Regulatory Implementation Phase					
22/05/2018	Indirectly Treated	26	0.0092***	0.0089***	3.909773 ***	3.094454 ***
	Treated	6	0.0086	0.0060	0.782143	-0.20927
	Untreated	40	0.0038	0.0009	2.206257 **	2.672665 ***
24/05/2018	Indirectly Treated	26	-0.0007	-0.0007	-3.10273 ***	-3.10273 ***
	Treated	6	-0.0096**	-0.0096**	-6.82024 ***	-6.82024 ***
	Untreated	40	-0.0041*	-0.0041*	-1.19974	-1.19974

Appendix Figure: Event study with restricted Treated Bank size

					pre Deregulation							
Panel A			Indirectly Treated				Treated				Untreated	
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev
Profitability Ratios												
ROA	87	0.009332	0.009395	0.002694	18	0.010686	0.010737	0.005635	130	0.00859	0.009145	0.003964
ROE	87	0.082249	0.085851	0.024445	18	0.083529	0.076196	0.043286	130	0.082129	0.086205	0.048067
Net_Int_Income_to_Assets	87	0.031193	0.031012	0.00406	18	0.031841	0.030275	0.004399	130	0.03024	0.029698	0.006279
Capital and Leverage												
Leverage_Ratio	87	8.926748	8.368235	1.906115	18	7.914286	7.562465	1.143701	130	9.804969	9.497557	2.185766
Equity_to_Assets	87	0.11595	0.1195	0.019319	18	0.128675	0.132233	0.017131	130	0.106286	0.105292	0.020887
Tier1_Capital_Ratio	87	12.52418	12.45	2.454274	18	13.28222	11.64	3.780281	130	12.80815	11.985	3.043749
Total_Capital_Ratio	87	14.08448	13.63	2.040226	18	14.80444	12.685	3.882494	130	14.33269	13.51	2.781689
Tangible_Eq_to_Total_Assets	87	0.085121	0.082597	0.01565	18	0.09673	0.086808	0.02125	130	0.089056	0.086238	0.02091
Liabilities_to_Equity	87	7.912133	7.368235	1.876969	18	6.910154	6.551578	1.14459	130	8.791968	8.447591	2.185428
Capital_to_Deposits	87	0.150032	0.15384	0.028958	18	0.167814	0.171667	0.028792	130	0.137442	0.136215	0.031835
Deposits_to_Assets	87	0.777668	0.784534	0.053255	18	0.772557	0.763398	0.042585	130	0.781929	0.789334	0.06898
Risk and Loss Provision												
Loan_Loss_Provision_to_Assets	87	0.001257	0.000932	0.001993	18	0.002757	0.00166	0.003545	130	0.00147	0.001037	0.002924
Allowance_Loss_to_Assets	87	0.001253	0.000932	0.001998	18	0.002815	0.00166	0.003507	130	0.001472	0.001037	0.002923
Funding_Liabilities_to_Assets	87	0.882825	0.880501	0.018043	18	0.870782	0.867015	0.0173	130	0.892393	0.89288	0.021193
Provisions_to_Net_Income	87	0.2667	0.097859	1.176881	18	0.63116	0.146168	1.870081	130	-0.81704	0.112949	8.131302
Operational Efficiency												
Net_Int_Income_to_Op_Income	87	0.771741	0.766239	0.090877	18	0.774634	0.773981	0.083144	130	0.786904	0.78754	0.117319
Diversification of Non Int income	87	0.228259	0.233762	0.090877	18	0.225366	0.226019	0.083144	130	0.213096	0.21246	0.117319
Interest Dependence ratio	87	0.654241	0.658828	0.097612	18	0.685637	0.693704	0.15016	130	0.640066	0.634854	0.164142
Growth Metrics												
Asset_Growth	87	-0.00297	0.064536	0.388088	17	0.062523	0.030443	0.418625	130	-0.11448	0.057428	0.390918
Equity_Growth	87	0.037952	0.060147	0.468944	17	0.163783	0.055553	0.571354	129	-0.11772	0.042225	0.410595
Deposit_Growth	87	-0.00511	0.066318	0.395646	17	0.030493	0.026621	0.40693	130	-0.11936	0.054903	0.396193
					post Deregulation							
Panel B			Indirectly Treated				Treated				Untreated	
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev
Profitability Ratios												
ROA	187	0.01038	0.011176	0.005419	41	0.010823	0.012921	0.011256	292	0.010929	0.011041	0.004282
ROE	187	0.085727	0.089613	0.051941	40	0.082736	0.089354	0.1166	292	0.100619	0.099147	0.040371
Net_Int_Income_to_Assets	187	0.03017	0.029601	0.003894	41	0.032272	0.031457	0.005927	292	0.030444	0.030253	0.00539
Capital and Leverage												
Leverage_Ratio	187	8.555308	8.115169	2.082874	40	8.06404	7.566875	1.917528	292	9.428281	9.072544	2.042711
Equity_to_Assets	187	0.122351	0.123226	0.023975	40	0.12999	0.132155	0.026708	292	0.110472	0.110223	0.021391
Tier1_Capital_Ratio	181	12.58392	12.39	1.692515	40	14.46775	12.705	4.104352	285	12.91296	12.4	2.360882
Total_Capital_Ratio	182	14.55996	14.365	1.607502	40	16.43675	14.57	4.049984	287	14.84892	14.46	2.087633
Tangible_Eq_to_Total_Assets	187	0.083772	0.083449	0.012849	40	0.0992	0.086823	0.027163	292	0.089814	0.08773	0.015227
Liabilities_to_Equity	187	7.542579	7.115169	2.057274	40	7.05021	6.564802	1.916107	292	8.421004	8.072544	2.042253
Capital_to_Deposits	187	0.154885	0.152741	0.033922	40	0.164652	0.16211	0.042597	292	0.137376	0.135515	0.029659
Deposits_to_Assets	187	0.794616	0.797256	0.045217	41	0.801018	0.803584	0.050018	292	0.809441	0.815704	0.049249
Risk and Loss Provision												
Loan_Loss_Provision_to_Assets	168	0.001404	0.000933	0.002258	37	0.002439	0.001843	0.002967	265	0.001681	0.001051	0.002552
Allowance_Loss_to_Assets	187	0.001456	0.000976	0.002192	41	0.002381	0.001843	0.002841	292	0.001683	0.001068	0.002505
Funding_Liabilities_to_Assets	187	0.876543	0.876774	0.023021	41	0.868454	0.868093	0.026176	292	0.888751	0.889334	0.021553
Provisions_to_Net_Income	168	-0.16652	0.079866	3.992753	37	0.255701	0.121134	0.459516	265	-0.02443	0.094313	3.94404
Operational Efficiency												
Net_Int_Income_to_Op_Income	187	0.783587	0.79379	0.07659	41	0.801759	0.796097	0.071821	292	0.817704	0.823217	0.10035
Diversification of Non Int income	186	0.216413	0.20621	0.07659	41	0.198241	0.203903	0.071821	292	0.182296	0.176783	0.10035
Interest Dependence ratio	187	0.657719	0.664575	0.113272	41	0.706751	0.709637	0.157855	292	0.663857	0.661467	0.136696
Growth Metrics												
Asset_Growth	187	0.113386	0.054392	0.178155	41	0.112756	0.090998	0.177231	292	0.663857	0.065877	0.142696
Equity_Growth	187	0.126548	0.070457	0.215032	40	0.106409	0.081387	0.262103	292	0.663857	0.075255	0.200936
Deposit_Growth	187	0.118735	0.066744	0.18317	41	0.126975	0.084197	0.177827	292	0.663857	0.068727	0.148012

Appendix Figure ii: Summary statistics with restricted Treated Bank size

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		Untreated Vs Treated			
		Equity_Growth			
Source	DF	Type III SS	Mean Squa	F Value	Pr > F
Untreated_	1	0.770358	0.770358	8.86	0.0031
Post_Dere	1	0.332541	0.332541	3.82	0.0511
Untreated	1	0.900514	0.900514	10.35	0.0014
		Deposit_Growth			
Source	DF	Type III SS	Mean Squa	F Value	Pr > F
Untreated_	1	0.30188	0.30188	4.71	0.0306
Post_Dere	1	1.11229	1.11229	17.34	<.0001
Untreated	1	0.181795	0.181795	2.83	0.093
		Asset_Growth			
Source	DF	Type III SS	Mean Squa	F Value	Pr > F
Untreated_	1	0.378232	0.378232	6.06	0.0142
Post_Dere	1	0.747746	0.747746	11.98	0.0006
Untreated	1	0.289028	0.289028	4.63	0.0319

Appendix Figure iii: Untreated vs restricted Treated Difference in Difference