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# **Investigating the Macroeconomic Impact of US Banking Industry Deregulation, a Credit Supply Shock Event, on Business Dynamism**

Term Paper - Macroeconomics 2B

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# **Investigating the Macroeconomic Impact of US Banking Industry Deregulation, a Credit Supply Shock Event, on Business Dynamism**

## **1. Introduction & Related Literature**

This paper aims to analyze the macroeconomic impact of the US banking industry deregulation, a credit supply shock event, on business dynamism, using states that experienced deregulation as the treatment group and others as the control group. Our work builds on the seminal study by Jayaratne and Strahan (1996), who found evidence that the quality of lending improved after the intrastate branch banking reform, contributing to faster economic growth, and significantly improving rates of real per capita growth in income and output. Boustanifar (2014) remarked in his published work—on the impact of credit market development on employment—that “the removal of restrictions on geographic expansion resulted in better efficiency and pricing of banking services”—the cost of external finance, of loans, went down. Employment rose at a higher rate in states where more banking reforms took place, and Boustanifar found evidence that this growth was accounted for by incumbent firms expanding in size due to the ease of financing conditions. Krishnan, Nandy, and Puri (2015) found that the total factor productivity of constrained firms increased following deregulations.

Our work, a novice econometric investigation, will seek to first understand the impact of the staggered US intrastate banking reform on business dynamism (Part A) and later the impact of the interstate banking reforms (Part B). We will use the "difference-in-differences" econometric estimation approach, typically reserved for panel data sets, used by both Jayaratne and Strahan (1996) and Boustanifar (2014), to exploit the cross-sectional (US states) and time-series reform variation (staggered banking reform state-by-state) to accomplish the above-stated objective. Analysis is provided in each section to speak to the findings.

## 2. Main Analysis - US Intrastate Banking Reform and Business Dynamism (Part A)

In this section, we analyze data on the US Intrastate Banking Reforms in relation to business dynamism.

### 2.1 Data Description

The data for this part of the project come from varied sources. The business dynamism statistics are obtained from the United States Census Bureau for the time period of 1978 to 2019, for all 50 states of the USA and the District of Columbia. This dataset contains longitudinal data on several key variables charting the history of business in US states, such as the rate of establishments born, the rate of establishments exited, and the rate of net jobs created during the last 12 months. Additionally, this data is supplemented with per capita personal income and population data from the U.S. Bureau of Economic Analysis for the same time-period and states. Finally, the U.S. Consumer Price Index annual inflation rate data from the World Bank Group is used to construct the “real per capita personal income” variable. We begin our analysis with a total of 2,142 observations and 32 variables (see Figure 1 for data summary).

*Figure 1: Data Summary*

1. summarize					
Variable	Obs	Mean	Std. dev.	Min	Max
state	0				
naicscoden-s	0				
meaningofn-l	0				
year	2,142	1998.5	12.12375	1978	2019
numberoffi-m	2,142	94604.25	103368.4	7114	674532
numberofes-b	2,142	117651.5	128821.6	8399	847415
numberofem-p	2,142	2010473	2242795	104866	1.53e+07
dhedenomin-m	2,142	1995661	2227003	106194	1.51e+07
numberofes-g	2,142	13513.42	15795.95	1310	104787
rateofesta-h	2,142	11.5722	2.525015	6.474	24.684
numberofes-i	2,142	12122.42	14127.95	1149	98521
rateofesta-g	2,142	10.28859	1.718553	6.617	20.88
numberofjo-g	2,142	310955.1	364328.5	19970	2367110
numberofjo-s	2,142	109616.3	130616.7	6502	923585
jobscreate-s	2,142	201338.9	235326.8	11286	1575156
rateofjobs-a	2,142	5.631546	1.682472	2.366	14.099
rateofjobs-n	2,142	15.75425	3.324619	8.786	35.118
numberofjo-a	2,142	281379.8	333220.1	19165	2704957
numberofjo-b	2,142	96279.54	117504.7	5988	915572
numberofjo-e	2,141	185158.3	217184.1	10445	1789385
rateofjobs-i	2,142	4.814928	1.284256	2.167	17.155
rateofjobs-d	2,142	14.08957	2.830447	8.382	34.08
numberofne-d	2,142	29575.31	82892.35	-872938	741595
rateofnetj-n	2,142	1.664683	3.003421	-13.835	18.792
rateofreal-l	2,142	27.18873	4.876708	16.765	65.352
numberoffi-e	2,142	8074.257	9471.729	738	64187
numberofes-d	2,142	8252.734	9690.035	747	65629
numberofem-f	2,142	49223.13	61051.98	3286	494723
percapitap-s	2,142	28629.46	14420.34	5917	83270
population-s	2,142	5419471	6073676	402191	3.95e+07
cpiannuali-o	2,142	3.52076	2.707491	-.3555463	13.5492
realpercap-e	2,142	27883.95	14320.71	5497.489	81787.84

## 2.2 The Econometric Methodology

To investigate the impact of the US Banking Industry Intrastate Deregulation on business dynamism, we've devised two OLS fixed-effects specifications in the footsteps of Jayaratne and Strahan (1996) which will test the staggered credit supply shock on the following dependent variables: the rate of establishments born, the rate of establishments exited, and the rate of net jobs created during the last 12 months.

The OLS fixed-effects specification without controls is as follows:

$$(1) \text{ } BDDependentVariable_{it} = \text{constant} + \alpha_t + \beta_i + \gamma D_{t,i} + \epsilon_{t,i}$$

, where the impact on the dependent variable is tested during year  $t$  in state  $i$ . The  $D_{t,i}$  is for the dummy variable which equals 1 after states experience branching deregulation via merger & acquisition. This new variable is constructed using Table 1 from Jayaratne and Strahan (1996). In the same spirit as Jayaratne and Strahan (1996), in our specification also,  $\beta_i$  will measure the state-specific effects in relation to the dependent variable, and  $\alpha$  will measure the common shock to all observations at time  $t$ .  $\gamma$  will capture the effect on the dependent variable from branching deregulation.

The OLS fixed-effects specification with controls is as follows:

$$(2) \text{ } BDDependentVariable_{it} = \text{constant} + \alpha_t + \beta_i + \gamma D_{t,i} + \delta I_{t,i} + \zeta P_{t,i} + \epsilon_{t,i}$$

, where  $\delta$  controls for “real per capita personal income” and  $\zeta$  controls for “population” for state  $i$  in year  $t$ . The remaining variables are the same as above.

Finally, we will exclude Delaware (42 observations) from the analysis for the same reasons as Jayaratne and Strahan (1996), and we'll follow suit with their approach of dropping the year in which the regulation went into effect when it comes to  $D_{t,i}$  (32 additional observations). Thus, the final number of observations is 2,068, comprising of 2,100 years of data from 50 states, without the 32 state-years when deregulation went into effect.

## 2.3 OLS Estimations

The results from the regressions on three dependent variables are as follows. There is no significant impact of the deregulation ( $D_i$  variable), with or without controls, on “the rate of establishments born” (see Figure 2 and 3 below).

**Figure 2: Impact of intrastate banking deregulations on “the rate of establishments born in the last 12 months,” without controls**

```
. reghdfe rateofestablishmentsbornduringth Di, absorb(state year) cluster(state)
(MWFE estimator converged in 4 iterations)
```

HDFE Linear regression	Number of obs	=	2,068
Absorbing 2 HDFE groups	F( 1, 49)	=	0.17
Statistics robust to heteroskedasticity	Prob > F	=	0.6785
	R-squared	=	0.8943
	Adj R-squared	=	0.8893
	Within R-sq.	=	0.0012
Number of clusters (state)	=	50	Root MSE = 0.8438

(Std. err. adjusted for 50 clusters in state)

rateofesta~h	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]
Di	-.1291836	.3097632	-0.42	0.678	-.7516762 .4933089
_cons	11.64269	.2522443	46.16	0.000	11.13579 12.1496

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs
state	50	50	0 *
year	42	0	42

\* = FE nested within cluster; treated as redundant for DoF computation

**Figure 3: Impact of intrastate banking deregulations on “the rate of establishments born in the last 12 months,” with controls**

```
. reghdfe rateofestablishmentsbornduringth Di realpercapitapersonalincome populationpersons, absorb(state year) cluster(state)
(MWFE estimator converged in 4 iterations)
```

HDFE Linear regression	Number of obs	=	2,068
Absorbing 2 HDFE groups	F( 3, 49)	=	7.47
Statistics robust to heteroskedasticity	Prob > F	=	0.0003
	R-squared	=	0.9036
	Adj R-squared	=	0.8990
	Within R-sq.	=	0.0893
Number of clusters (state)	=	50	Root MSE = 0.8062

(Std. err. adjusted for 50 clusters in state)

rateofestablishmentsbornd~h	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]
Di	.02209	.3031831	0.07	0.942	-.5871793 .6313593
realpercapitapersonalincome	.0000935	.00002	4.68	0.000	.0000534 .0001337
populationpersons	-1.82e-08	3.92e-08	-0.46	0.644	-9.69e-08 6.05e-08
_cons	8.995493	.705751	12.75	0.000	7.577233 10.41375

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs
state	50	50	0 *
year	42	0	42

\* = FE nested within cluster; treated as redundant for DoF computation

However, respectively, at the significance level of 10% and 5%, with and without controls (see Figures 4 and 5), deregulation had a negative impact on “the rate of

establishments exited.” Thus, organizations exited the market at a significantly less rate than before deregulation.

**Figure 4: Impact of intrastate banking deregulations on “the rate of establishments exited in the last 12 months,” without controls**

```
. reghdfe rateofestablishmentsexitedduring Di, absorb(state year) cluster(state)
(MWFE estimator converged in 4 iterations)
```

HDfE Linear regression	Number of obs	=	2,068
Absorbing 2 HDfE groups	F( 1, 49)	=	4.27
Statistics robust to heteroskedasticity	Prob > F	=	0.0441
	R-squared	=	0.8159
	Adj R-squared	=	0.8073
	Within R-sq.	=	0.0263
Number of clusters (state)	Root MSE	=	0.7573

(Std. err. adjusted for 50 clusters in state)

rateofesta~g	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]
Di	-.5514407	.2668589	-2.07	0.044	-1.087714 - .0151676
_cons	10.7188	.2173068	49.33	0.000	10.28211 11.1555

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs
state	50	50	0 *
year	42	0	42

\* = FE nested within cluster; treated as redundant for DoF computation

**Figure 5: Impact of intrastate banking deregulations on “the rate of establishments exited in the last 12 months,” with controls**

```
. reghdfe rateofestablishmentsexitedduring Di realpercapitapersonalincome populationpersons, absorb(state year) cluster(state)
(MWFE estimator converged in 4 iterations)
```

HDfE Linear regression	Number of obs	=	2,068
Absorbing 2 HDfE groups	F( 3, 49)	=	2.94
Statistics robust to heteroskedasticity	Prob > F	=	0.0424
	R-squared	=	0.8189
	Adj R-squared	=	0.8103
	Within R-sq.	=	0.0422
Number of clusters (state)	Root MSE	=	0.7514

(Std. err. adjusted for 50 clusters in state)

rateofestablishmentsexite~g	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]
Di	-.4933904	.2540562	-1.94	0.058	-1.003935 .0171547
realpercapitapersonalincome	.0000318	.0000172	1.85	0.070	-2.73e-06 .0000663
populationpersons	4.63e-08	5.48e-08	0.84	0.402	-6.39e-08 1.56e-07
_cons	9.523598	.6304473	15.11	0.000	8.256667 10.79053

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs
state	50	50	0 *
year	42	0	42

\* = FE nested within cluster; treated as redundant for DoF computation

Finally, at the significance level of 5%, both with and without controls, “the rate of net job created in the last 12 months” experienced a positive shock post-deregulation (*see Figures 6 and 7*).

**Figure 6: Impact of intrastate banking deregulations on “the rate of net jobs created during the last 12 months,” with controls**

```
. reghdfe rateofnetjobscreatedfromexpandin Di, absorb(state year) cluster(state)
(MWFE estimator converged in 4 iterations)
```

HDFFE Linear regression	Number of obs	=	2,068
Absorbing 2 HDFFE groups	F( 1, 49)	=	5.03
Statistics robust to heteroskedasticity	Prob > F	=	0.0294
	R-squared	=	0.6260
	Adj R-squared	=	0.6086
	Within R-sq.	=	0.0080
Number of clusters (state)	=	50	Root MSE = 1.8815

(Std. err. adjusted for 50 clusters in state)

rateofnetj~n	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]
Di	.7491949	.3339006	2.24	0.029	.0781966 1.420193
_cons	1.043546	.2718997	3.84	0.000	.497143 1.589949

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs
state	50	50	0 *
year	42	0	42

\* = FE nested within cluster; treated as redundant for DoF computation

**Figure 7: Impact of intrastate banking deregulations on “the rate of net jobs created during the last 12 months,” with controls**

```
. reghdfe rateofnetjobscreatedfromexpandin Di realpercapitapersonalincome populationpersons, absorb(state year) cluster(state)
(MWFE estimator converged in 4 iterations)
```

HDFFE Linear regression	Number of obs	=	2,068
Absorbing 2 HDFFE groups	F( 3, 49)	=	6.98
Statistics robust to heteroskedasticity	Prob > F	=	0.0005
	R-squared	=	0.6307
	Adj R-squared	=	0.6131
	Within R-sq.	=	0.0206
Number of clusters (state)	=	50	Root MSE = 1.8705

(Std. err. adjusted for 50 clusters in state)

rateofnetjobscreatedfrom~n	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]
Di	.838266	.3533808	2.37	0.022	.1281207 1.548411
realpercapitapersonalincome	.0000632	.0000195	3.23	0.002	.0000239 .0001024
populationpersons	-1.16e-07	4.60e-08	-2.53	0.015	-2.09e-07 -2.41e-08
_cons	-.1592134	.8503782	-0.19	0.852	-1.868112 1.549686

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs
state	50	50	0 *
year	42	0	42

\* = FE nested within cluster; treated as redundant for DoF computation



These results are in line with what Boustanifar (2014) found: the incumbent firms, rather than new entrants to the market, owing to easier access to efficient and cheaper credit, grew in size post-deregulation. This expansion resulted in new job creation or lower job destruction driven by these firms, which positively impacted the *rate of net jobs created*. However, where our data differs is that we do find a significant impact of deregulation on the exit rate of firms, and Boustanifar (2014) does not.

## 2.4 The Short- and Long-Run Effects

In line with Jayaratne and Strahan's (1996) approach, we also split the deregulation indicator variable into years 1-5 after deregulation, years 6-10 after regulation, and years 10+ after deregulation (the variable takes value of 1 only for the stated years for each observation), to understand the short- and long-run effects of deregulation on our three business dynamism dependent variables. The results, summarized in the table below, show that the effects were the strongest in years 1-5 after deregulation, especially in significantly reducing the rate of the exit of firms in states that experienced deregulation. During this time, the rate of net jobs created was also statistically significant. From years 6-10, deregulation still had a significant impact on the same variables at the significance level of 5%. However, the effects fade long-term as we look past 10 years of deregulation. Our dataset comprises of 42 unique years.

**Table 1: Impact of intrastate banking deregulations on business dynamism overtime**

	Years Post-Deregulation		
Business Dynamism Outcomes	Years 1-5	Years 6-10	Years 10+
<b>Without Controls:</b>	<i>Coeff (Robust SE)</i>	<i>Coeff (Robust SE)</i>	<i>Coeff (Robust SE)</i>
Rate of Establishments Born in Last Year	-0.225 (0.248)	-0.141 (0.319)	0.009 (0.418)
Rate of Establishments Exited in Last Year	-0.677*** (0.246)	-0.590** (0.277)	-0.353 (0.317)
Rate of Net Jobs Created in Last Year	0.925** (0.381)	0.735** (0.351)	0.523 (0.342)
<b>With Controls:</b>	<i>Coeff (Robust SE)</i>	<i>Coeff (Robust SE)</i>	<i>Coeff (Robust SE)</i>
Rate of Establishments Born in Last Year	-0.083 (0.234)	0.017 (0.315)	1.71 (0.421)
Rate of Establishments Exited in Last Year	-0.624*** (0.232)	-0.531** (0.264)	-0.285 (0.310)
Rate of Net Jobs Created in Last Year	1.011** (0.399)	0.830** (0.371)	0.608** (0.351)

Significance levels: 1%\*\*\*, 5%\*\*\*, and 10%\*

## 2.5 Economic Intuition of Results and Comparison with Boustanifar (2014)

The economic intuition is much the same as Boustanifar (2014) noted in his paper: “...the increased employment following banking reform does not come from extensive, but rather from intensive, margins. That is, the reforms led to either higher job creation or lower job destruction within firms.” Our findings support the same notion. The exit rate of the firms declined short-term following deregulation and the increase in *net jobs created* can be attributed to new job creation or job retention within firms. Where our findings do differ is that we find a significant negative impact on the exit rate of firms where intrastate deregulation took place via mergers & acquisitions, whereas, Boustanifar (2014) does not find such a link. A key reason for this difference may be that we created the reform indicator variable using Jayaratne and Strahan’s (1996) work, whereas Boustanifar (2014) has used an updated intrastate deregulation index in their work. Overall, where we do find agreement, we can lay claim that the credit supply shock event, in the form of efficient and cheaper bank financing, positively benefitted incumbent firms.

### 3. Main Analysis Extensions (Part B)

In this section, we extend the analysis to include IBBEA Interstate Banking Reforms to understand how they impacted business dynamism, and we conduct industry-specific business dynamism impact analysis of both reforms.

#### 3.1 Impact of the IBBEA Interstate Banking Reform on Business Dynamism, Taking Prior Deregulatory Shocks Into Account

In 1997, the Interstate Banking and Branching Efficiency Act of 1994 (IBBEA) went into effect in 23 states for the first time. This deregulatory event, a quasi-natural experiment, provides an interesting framework for a difference-in-differences design—treatment and control groups—to test the causal effect of interstate banking reform on our three business dynamism dependent variables. In order to appropriately assess the impact, we followed the following steps: a) we excluded states that deregulated in 1996 or 1998 (11 states) to avoid confounding effects; b) we created a treatment dummy for states that deregulated in 1997, equaling 1 if states deregulated in that year and 0 otherwise; c) we focused on the timeframe 1996-1998 to estimate the short-term effect of interstate deregulation and excluded observations not in this timeframe; d) we defined the post-deregulation period; and e) we created an OLS specification taking into account the prior deregulations.

The OLS difference-in-differences specification with prior deregulations as control is as follows:

$$(3) \text{ } BDDependentVariable_{it} = \text{constant} + \alpha_t + \beta_i + \eta(\text{post}_t * \text{treated}_i) + \gamma \text{EDI}_{t,i} + \varepsilon_{t,i}$$

, where (3) is the same specification as (1), but here EDI stands for early deregulation index, constructed using the same method as Krishnan, Nandy, and Puri (2015): “*This index is zero prior to the earlier of the year of intra- or inter-state deregulations, one if the state deregulates either full intra-state branching through acquisition and de novo branching or inter-state banking, and two if the state deregulates both types of branching expansions*”, and  $\eta$  represents the causal treatment effect after interacting the post-event dummy with the treatment dummy.

The OLS difference-in-differences specification with prior deregulations, real personal income and population as controls is as follows:

$$(4) \text{ } BDDependentVariable_{it} = \text{constant} + \alpha_t + \beta_i + \eta(\text{post}_t * \text{treated}_i) + \gamma \text{D}_{t,i} + \delta \text{I}_{t,i} + \zeta \text{P}_{t,i} + \varepsilon_{t,i}$$

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### 3.1.1 OLS Estimations and Analysis

Select results of these regressions are shared in table 2 below. The treatment effect is significant for the rate of establishments born. After getting the treatment, *the rate of establishments born in the last year* declines. Please note that there could be a confounding variable present or there may likely be an error in our specification that makes the treatment effect significant for that dependent variable. Perhaps we need to add a one-period lag to the dependent variables to appropriately deduce the effects. Finally, as Krishnan, Nandy, and Puri (2015) point out, the interstate banking deregulation only affects who can own bank assets. It is the intra-state deregulation of restriction on branching that allows banks to enter new markets, takeover other bank's assets through mergers & acquisitions, or open new branches. Thus, the efficiency and cost of credit benefits attributed to bank deregulations likely precede the IBBEA interstate banking deregulations through early deregulations as witnessed in the previous chapter. The IBBEA interstate banking deregulations, thus, fail to significantly deliver on the business dynamism benefits.

**Table 2: Impact of IBBEA interstate banking deregulations on business dynamism**

Business Dynamism Outcomes	Post##Treated Coefficient (Std. Error)
<b>With EDI Control:</b>	
Rate of Establishments Born in Last Year	-0.237** (0.111)
Rate of Establishments Exited in Last Year	0.016 (0.117)
Rate of Net Jobs Created in Last Year	-0.062 (0.370)
<b>With All Controls:</b>	
Rate of Establishments Born in Last Year	-0.319** (0.130)
Rate of Establishments Exited in Last Year	-0.075 (0.122)
Rate of Net Jobs Created in Last Year	-0.017 (0.379)

Significance levels: 1%\*\*\*, 5%\*\*, and 10%\*

### 3.2 Impact of Intrastate and IBBEA Banking Reforms on Business Dynamism in Finance and Insurance (NAICS 52) and Manufacturing (NAICS 31-33) Industries

For this analysis, we'll focus separately on Finance and Insurance (NAICS 52) and Manufacturing (NAICS 31-33) industries. To test for intrastate banking reforms impact, we'll use the same OLS specification as (1) and (2), and Jayaratne and Strahan's (1996) approach of excluding Delaware and dropping the year in which the intrastate M&A regulation went into

effect when it comes to  $D_{t,i}$ . For testing the impact of IBBEA banking reform, we'll use the specification stated in Section 3.1. The results are shared below.

### 3.1.1 Finance and Insurance (NAICS 52) OLS Estimations and Analysis

Intrastate M&A banking reform significantly negatively impacted *the rate of establishments born in last year* in Finance and Insurance industry following deregulation (see Table 3 below). This finding may speak to the consolidation in the market that took place following deregulation: stronger banks merged with or acquired weaker banks, thus gaining a bigger market share and putting up a barrier to entry for new entrants through economies of scale and rapid expansion. On the other hand, *the rate of establishments exited in last year* in the Finance and Insurance industry significantly went down. Thus fewer establishments left the industry following the reform. Given the documented positive impact on economic growth (Jayaratne and Strahan, 1996) and incumbent firm expansion and employment (Boustanifar, 2014), following intrastate M&A deregulation, it may follow that demand for finance and insurance products went up, thus lowering the exit rate of such firms from the market long-term. This high demand paired with increased consolidation in the sector may have lowered the exit rate. This point could be a topic for future research.

On other hand, the IBBEA interstate banking deregulation did not significantly impact business dynamism in the Finance and Insurance sector in the USA (see Table 4).

“The rate of net jobs created” in Finance and Insurance industry was not significantly impacted by any of the reforms.

**Table 3: Impact of Intrastate M&A banking deregulations on business dynamism in NAICS 52**

Business Dynamism Outcomes	Coefficient (Standard Error)
<b>Without Controls:</b>	
Rate of Establishments Born in Last Year	-0.794** (0.298)
Rate of Establishments Exited in Last Year	-1.128*** (0.280)
Rate of Net Jobs Created in Last Year	0.565 (0.510)
<b>With Controls:</b>	
Rate of Establishments Born in Last Year	-0.633** (0.286)
Rate of Establishments Exited in Last Year	-1.074*** (0.260)
Rate of Net Jobs Created in Last Year	0.583 (0.503)

Significance levels: 1%\*\*\*, 5%\*\*\*, and 10%\*

**Table 4: Impact of IBBEA interstate banking deregulations on business dynamism in NAICS 52**

Business Dynamism Outcomes	Post##Treated Coefficient (Std. Error)
<b>With EDI Control:</b>	
Rate of Establishments Born in Last Year	-1.027 (0.638)
Rate of Establishments Exited in Last Year	-0.101 (0.615)
Rate of Net Jobs Created in Last Year	-1.093 (1.599)
<b>With All Controls:</b>	
Rate of Establishments Born in Last Year	-1.090 (0.665)
Rate of Establishments Exited in Last Year	-0.055 (0.627)
Rate of Net Jobs Created in Last Year	-1.425 (1.585)

Significance levels: 1%\*\*\*, 5%\*\*, and 10%\*

### 3.1.2 Manufacturing (NAICS 31-33) OLS Estimations and Analysis

We did not find a significant impact of Intrastate M&A Reform (see Table 5) or IBBEA Interstate Banking Reform (see Table 6) on business dynamism in the manufacturing sector. Thus, the reforms may be disproportionate in the strength of their impact on business dynamism across economic sectors. This issue should be further investigated.

**Table 5: Impact of Intrastate M&A banking reform on business dynamism in NAICS 31-33**

Business Dynamism Outcomes	Coefficient (Standard Error)
<b>Without Controls:</b>	
Rate of Establishments Born in Last Year	-0.118 (0.292)
Rate of Establishments Exited in Last Year	-0.420 (0.328)
Rate of Net Jobs Created in Last Year	0.718 (0.556)
<b>With Controls:</b>	
Rate of Establishments Born in Last Year	0.028 (0.284)
Rate of Establishments Exited in Last Year	-0.395 (0.321)
Rate of Net Jobs Created in Last Year	0.818 (0.523)

Significance levels: 1%\*\*\*, 5%\*\*, and 10%\*

**Table 6: Impact of IBBEA interstate banking deregulations on business dynamism in NAICS 52**

<b>Business Dynamism Outcomes</b>	<b>Post##Treated Coefficient (Std. Error)</b>
<b>With EDI Control:</b>	
Rate of Establishments Born in Last Year	-0.346 (0.383)
Rate of Establishments Exited in Last Year	0.198 (0.194)
Rate of Net Jobs Created in Last Year	-0.424 (0.952)
<b>With All Controls:</b>	
Rate of Establishments Born in Last Year	-0.399 (0.402)
Rate of Establishments Exited in Last Year	0.111 (0.199)
Rate of Net Jobs Created in Last Year	-0.499 (0.959)

Significance levels: 1%\*\*\*, 5%\*\*\*, and 10%\*

## 4. Conclusions and Future Avenues for Research

Our novice econometric investigation and analysis uncover that the staggered interstate M&A banking reforms produced a substantial short-term impact on business dynamism in the states that experienced it (up to 10 years following the reform). The rate of firms exiting the market significantly decreased following deregulation and net jobs increased. The effects were the strongest in the first 5 years following deregulation, but still significant in year 6-10 following reform before fading in significance. Upon testing the impact of IBBEA interstate banking reforms, while accounting for prior deregulations, we find that the impact of this reform was mostly negligible, though our specification may need to be fine-tuned. Upon comparing the effects of these two reforms individually on Finance and Insurance (NAICS 52) and Manufacturing (NAICS 31-33) industries, we find that the credit supply shock event produced disparate business dynamism benefits across the two income sectors. This topic warrants further investigation as most of the literature looks at aggregate economic benefits of the reforms. The granularity on the winners and losers of such reforms can shed a further light on who benefits from such reforms and how, as such shocks have the power to structurally change the economy long-term.



## References

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## Appendix I: Project Files

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Project data files can be accessed the following links:

1. [Project datasets](#) (format .dta; Google Drive link)
2. [Project do file](#) (format .do; Google Drive link)