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Does going easy on distressed banks help economic growth?

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Does Going Easy on Distressed Banks Help Economic Growth?

Sean Hundtofte

Staff Report No. 823
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Abstract

During banking crises, regulators often relax their normal requirements and refrain from closing financially troubled banks. I estimate the real effects of such regulatory forbearance by comparing differences in state-level economic outcomes by the amount of forbearance extended during the U.S. savings and loan crisis. To instrument for forbearance, I use historical variation in deposit insurance—and hence supervision—of similar financial intermediaries (thrifts) and exploit fixed differences between regional supervisors of the same regulator. The evidence suggests a policy-induced increase in high-risk loans during the official forbearance period (1982-89), followed by a broader bust in house prices and real GDP.

Key words: financial crises, regulatory policy

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1 Introduction

When faced with a systemic banking crisis, regulators often avoid shutting down under-capitalized banks. In the recent financial crisis – as in most crises over the past 30 years (Laeven and Valencia, 2008) – administrations often err on the side of not immediately recognizing losses in the banking sector and instead “kick the can down the road.” This non-enforcement of regulatory requirements is referred to as regulatory forbearance.

Despite the economic importance of financial crises, the costs and benefits to aggregate output growth of such regulatory forbearance are unclear. Depending on the relative importance of different channels, avoiding the forced closures of banks could benefit growth by: maintaining the supply of credit (Ashcraft, 2005; Bernanke, 1983), or avoiding capital impairments from transient losses (Shleifer and Vishny, 2010). Alternatively, forbearance can harm growth if highly leveraged banks take on socially undesirable and negative expected value projects, owing to moral hazard or misaligned incentives between bank management, shareholders, and creditors (Akerlof and Romer, 1993; Gorton and Rosen, 1995; Rajan, 1994).

In this paper, I investigate the effects of regulatory forbearance on economic growth in the context of the 1980’s Savings and Loan (“S&L”) crisis. I compare the outcomes of states in which a large fraction of distressed banks are promptly failed against the outcomes of states where banks are allowed to freely continue taking deposits and arranging loans. To instrument for regulatory forbearance from 1982 to 1989, I take advantage of variation in regulators’ scope for forbearance during the crisis arising from arbitrary patterns of bank expansion in the 1800s.

Using this historical geographic variation, I find that forbearance leads to a relative boom on some dimensions, followed by a broader, wide-spread bust that registers in aggregate output growth. Forbearance is estimated to initially lead to a greater supply of higher-risk loans, accompanied by greater construction activity, job creation and destruction, and new business starts. But, after normal regulatory requirements are re-imposed

nationwide, forbearance is associated with larger contractions in real estate and cumulative average declines of more than 3% in real GDP, coinciding with a recession in 1990-1991.

At the root of the crisis is an interest rate shock to “thrift” balance sheets. Thrifts are banks traditionally focused on encouraging savings (thrift) and providing home mortgages to their local communities.¹ In the early 1980s, high interest rates render many thrifts insolvent by reducing the market value of their primary asset: long-duration mortgages fixed at historical, lower, rates. Thrift insolvencies affect two different federal deposit insurance funds. The Federal Deposit Insurance Corporation (FDIC) insures both thrifts (savings banks) and non-thrifts (commercial banks), while the Federal Savings and Loan Insurance Corporation (FSLIC) insures only thrifts (savings and loans). Figure 1 diagrams bank supervision in place until 1989, after which deposit insurance and regulatory oversight are consolidated. Because of a concentrated exposure to thrifts, the FSLIC is forced into a policy of greater regulatory forbearance because of limited capital and human resources (Kane, 1987).²

Figure 2 illustrates the difference in real GDP growth between “High Forbearance” states (those in the top quartile of forbearance received) and others. For analysis, I define forbearance as the asset-weighted proportion of banks in a state that are not failed, and have lower than the minimum capital requirement of 5% prior to the crisis (FDIC, 1997). Figure 2 illustrates a lack of consistent differences in economic growth before forbearance officially starts in 1982.³ While forbearance is an active policy from 1982-1989 a small positive differential develops, and most strikingly, after forbearance ends,⁴ the relationship to growth turns clearly negative. Figure 3 illustrates a more pronounced boom-bust dynamic in house prices.

¹“Savings banks” and “Savings and Loans” are two forms of thrift institutions. Throughout this paper, I will use “bank” to refer broadly to financial intermediaries: both thrifts and commercial banks.

²The FSLIC had \$6 billion in funds and 34 employees in 1980, but to deal with all of its insolvent institutions would have entailed costs exceeding \$25 billion. In contrast, the FDIC had \$11 billion in funds and over 3,500 employees, 460 of which were bank liquidators, and costs of approximately \$11 billion.

³Forbearance of banks formally starts in 1982 with The Garn-St. Germain Act.

⁴In 1989, the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) provides sufficient capital and a change in regulatory oversight to fail troubled institutions.

One natural concern with a naive interpretation of Figure 2 is if regulators incorporate knowledge about future regional economic outcomes into a strategy of which banks to fail.⁵ In order to address endogeneity concerns, the first instrumental variable I use is a state’s pre-crisis share of assets insured by FSLIC. This exploits a unique situation in the U.S. at this time that there are two significant federal deposit insurance funds for thrift institutions: one for savings banks and another for savings and loans. The modern savings bank model first reaches the U.S. in Philadelphia from Scotland in 1816, and by the early 1900s only 19 states gain state savings bank charters, whereas savings and loans (building societies) arrive in Philadelphia in 1831 and later spread nationwide. Savings and loans receive deposit insurance from the overwhelmed FSLIC. As a result states with a greater pre-crisis exposure to savings and loans subsequently receive greater forbearance.

For robustness, I introduce a second instrumental variable: the average of forbearance in state j ’s Federal Home Loan Bank (FHLB) district, excluding state j itself. This takes advantage of persistent differences in the speed of bank closures across different regulatory districts of the same regulator. Twelve FHLB districts were drawn up in the Great Depression, and each has persistent operational differences during the crisis. While results differ slightly in economic magnitude, the instruments do not reject each other in tests of overidentifying restrictions.

The diffusion of pre-crisis market share is naturally related to a state’s distance from Philadelphia, and regulatory districts could be related to different economic regions of the country, hence when using IVs I control for general economic region and allow growth to flexibly vary over time by Bureau of Economic Analysis (BEA) region. Allowing for overall differences between states as in a Differences-in-Differences framework, the exclusion restriction for the historical FSLIC instrument is then: pre-crisis FSLIC market share within a BEA region is unrelated to economic changes that arise after the start of the

⁵It should be noted that the typical concept of where to apply forbearance—as a temporary measure to weather a downturn until an economy returns to ‘normal’—should bias against the main finding of this paper, a contemporaneous positive and subsequent negative relationship to output growth in the cross-section.

crisis, except from its effect on the amount of undercapitalized, un-failed institutions. The exclusion restriction for the within-regulator (FHLBB) instrument is that forbearance in the rest of an FHLB district is unrelated to economic changes in a particular state during the crisis (compared to the average change for the BEA region), except through an effect on regulatory forbearance. To address identification concerns I introduce additional covariates, such as the overall level of bank failures, as alternative treatment policy variables and find that point estimates are robust to their addition.

In addition to lacking a-priori reasons for the market share of Savings & Loans to be related to non-regulatory changes in economic outcomes that arise in the 1980s, I check and find the instruments do not have a clear statistical relationship to ex-ante economic observables. Furthermore, in case the instruments happen to select for more cyclical states, I examine previous “placebo” business cycles and find no evidence that the instruments (or forbearance) correlate with this.

Previous estimates of the effects of policy response to financial crises use cross-country comparisons of GDP growth after different crises (Boyd et al., 2005; Dell’Ariccia et al., 2008). A separate strand of literature measures the effects of a particular crisis on sectors of an economy or particular borrowers, employing novel identification strategies such as the timing of a foreign crisis or the uncertain timing of a large bank failure (Caballero et al., 2008; Ivashina and Scharfstein, 2010; Peek and Rosengren, 2000; Santos, 2010). The principal contribution of this paper is to bridge these two literatures and provide plausible identification of the effects of a particular crisis’ regulatory response on aggregate output growth.

Focusing on the regulatory experiment in banking regulation provided by the S&L Crisis is broadly useful to our understanding of the lending channel. The results are consistent with a causal, supply-side, interpretation of stylized facts from broader, correlative, studies of business cycles and financial crises (Jordà et al., 2013, 2014; Leamer, 2007). The evidence is consistent with a simple view of forbearance as (initially) a relative rightward shift in loan

supply curves. [Bernanke and Lown \(1991\)](#) examine the relationship between bank capital and loan growth at commercial banks during the 1990-1991 recession and argue against the “credit-crunch” view of the recession held by many observers at the time. In contrast, I incorporate institution-level data, examine dynamics over the preceding decade, and find a strong relationship between preceding policy and growth.

One view of the S&L crisis was that regulatory forbearance encouraged unscrupulous behavior by banks. My measure of forbearance does not appear strongly related to outright fraud or criminal activity ([Akerlof and Romer, 1993](#)). In contrast to the other salient episode of forbearance of Japan with its government-directed lending and an associated lack of creative destruction ([Caballero et al., 2008](#)), I find that in the short-run at least, the unfettered “de-regulatory gamble” of the S&L crisis is positively related to measures typically associated with creative destruction and innovation (job-creation, job-destruction, new business starts, and patent filings). As in Japan, the evidence presented in this paper suggests a misallocation of credit with long-run consequences.

The evidence appears consistent with contemporary reports of a thrift industry growing into new and unwise investments. [Rajan \(1994\)](#) illustrates that liberal credit policies by banks, focusing on a particular asset class (e.g. Acquisition, Development and Construction, or ADC, Loans), exacerbate speculation and allow better current reported earnings at the expense of future earnings and true economic value creation. Consistent with this, I find that at the same time as expansions in “High Risk” loans and construction activity, higher forbearance states experience coincident increasing vacancy rates.⁶

In my bank-level analysis, find that it is not only forborne banks, but also their neighbours and the local banking industry which appear to shift in its activities. And in contrast to a simply equity-based version of moral hazard, I do not find that the least capitalised banks “stretch” the most into high risk lending. Previous empirical research of forbearance during the S&L Crisis focused on financial, bank-level outcomes and generally found that

⁶ “High Risk” is an FDIC categorization of commercial real estate lending, which includes Acquisition, Development & Construction (ADC) loans for early stage (residential) projects.

losses to the deposit insurance funds were exacerbated by forbearance. In this paper, I introduce the real economy as an outcome, and find that there are long-run consequences of forbearance to economic growth.

2 Previous Studies of Financial Crisis Policy Responses and Economic Growth

Previous estimates of the effects of forbearance on GDP growth rely on cross-country comparisons. [Dell’Ariccia et al. \(2008\)](#) look for systematic correlations between different policy responses and economic growth across various crises and find, on average, a weakly positive relationship between forbearance and growth. Their analysis focuses on concurrent outcomes and naturally depends on the timing of a crisis. My results agree with the cross-country/cross-crisis estimates if we restrict our attention to the first five years after the initial (1980) interest rate shock to the capitalization of thrifts in the U.S.

A comparison of recent individual banking crises paints a different picture of the real effects of forbearance. During the early 1990s, Scandinavian regulators moved swiftly to resolve undercapitalized institutions, separate assets into bad banks, arrange public takeovers, and force existing shareholders out of failed institutions. Japanese regulators failed to recognize losses in a timely manner and encouraged lending to less financially sound borrowers and industries ([Caballero et al., 2008](#)). Scandinavia enjoyed a quick recovery from its crisis ([Jonung, 2009](#)), while Japan is still recovering today.⁷

Japan provides an extended period of forbearance to study: [Gibson \(1995\)](#) finds Japanese banks passed their problems onto borrowers, lowering their investment activity. [Peek and Rosengren \(2005\)](#) find inefficient lending practices hurt bank profits. [Hoshi and Kashyap \(2004\)](#) find that the delay in bank recapitalization, coupled with government-encouraged lending, was at least partly to blame for the lost decade, and [Caballero et al. \(2008\)](#) find

⁷It was once common to refer to the 1990s as Japan’s “lost decade”. Recently the phrase Ushinawareta Nijunen is also used to refer to the “lost two decades”.

that lending to “zombie borrowers” stifled healthy product market competition.

Forbearance allows for lower levels of bank capital than observed in normal times. Bank capital is important to the extent it alleviates potential frictions in the credit channel and the traditional functions of financial intermediaries in screening, contracting, monitoring, and maturity transformation. Theoretically, low capital levels could exacerbate any of the classic frictions suggested by corporate finance: moral hazard or asymmetric information between bank management, shareholders, depositors and regulators. From an industrial organization perspective, allowing financially troubled banks to continue operating could also lead to excessive competition for deposits or loans amongst surviving banks.

Regulators too may suffer from distorted career incentives when their banking system is undercapitalized and may “pass the buck” onto the next administration. It might not be a coincidence that bank losses are only materially recognized in both Japan and the U.S. after new supervisory structures are put in place, and in the U.S. a new administration⁸) (Hoshi and Kashyap, 2015; Kane, 1989b).

3 Background on Savings Banks, Savings & Loans, and the Crisis

Both savings banks and savings and loans are a form of financial intermediary referred to in the U.S. as “thrifts.” In the 1800s, savings banks originally gathered community deposits and promoted thrift in local communities. Savings and loans⁹ formed as cooperative organizations to promote savings and provide home financing opportunities for the depositing members.

While balance sheets differ in the 1800s, by 1980 the mandates of these thrift institutions are similar. They both take local deposits and extend them back as consumer loans to the

⁸Signing the act introducing the official policy of capital forbearance in 1982, President Reagan said, “I think we’ve hit a home run.”

⁹ “Savings and loans” were first known as “Building Societies” when they formed in the UK, then “Building and Loan” societies after they arrived in the U.S.

local community, mainly in the form of mortgages. Prior to the crisis, the majority of residential mortgages in the U.S. are originated by thrifts, and national savings banks and savings and loans share a federal regulator (the Federal Home Loan Bank Board or FHLBB, of which FSLIC was a subsidiary), but the supervision—and hence forbearance—of state-chartered institutions varies. States outsource the ultimate supervision of state-chartered savings banks to the FDIC, whereas savings and loans are supervised by the local Federal Home Loan Bank (FHLB). The main business of each district’s FHLB is to make super-senior advances to its owners (the local savings and loan associations) and the head of each of the 12 FHLBs is the ultimate Principal Supervisory Agent (PSA) for savings and loans in its region.

As an identification strategy, I exploit this distinction between federal deposit insurance fund (FDIC/FSLIC) coverage of thrifts, and in addition exploit differences between FHLB districts as a separate instrumental variable (Further detail in Section 5). The analysis of this paper tests a joint hypothesis that forbearance is relevant and that banks are important locally. At the beginning of this crisis, branching restrictions are still in place before being lifted nationwide in 1994. As a result, most bank lending, either residential or small businesses, is still done locally. [Strahan \(2003\)](#) pursues an analysis over a similar time period as this paper, and finds supporting evidence for the local nature of banking by observing changes in economic outcomes associated with the removal of branching restrictions.

3.1 The Savings and Loan Crisis

Before the crisis, thrift charters are far more restrictive than commercial bank charters. For example, thrifts could not lend to businesses and, until 1980, their deposits are non-demand in nature, i.e. no checking accounts.

In 1981-1982, the thrift industry experiences its worst financial operating results since the start of deposit insurance. As a result of exposure to long-term fixed rate residential mortgages, thrift net worth declines by about one-quarter when short-term deposit rates

rise to historically unprecedented levels. The estimated costs to resolve underwater institutions were \$25-\$100 billion; the FSLIC has only \$6 billion in reserves (Kane, 1989a); and the federal government faces the choice of letting FSLIC fail (making up the difference with tax revenue) or to engage in forbearance.

In response to the interest rate shock, regulators lift interest rate caps, allow on-demand deposits, and raise deposit insurance limits to \$100,000 (from \$40,000) in 1980. The policy of explicit capital forbearance starts in 1982 with the passage of the Garn-St. Germain (or “Net Worth Certificate”) Act in “an attempt to address [thrifts’] interest rate mismatch.” This act allows regulators to ignore banks’ undercapitalization, issue “net worth certificates” (fictional capital), and broaden the business lines thrifts can pursue (FDIC, 1997). Regulators encourage growth and mergers between financial institutions, typically of the same charter, to “avoid much larger losses associated with traditional liquidations” (GAO, 1983). At the same time, in the early 1980s regulatory headcount is cut by funding freezes and the Reagan administration.¹⁰

In 1982 nominal capital requirements are reduced from 5% to 3%. The FHLBB takes advantage of the flexibility afforded to it to move to a new accounting method using “appraised equity value.” For purposes of capital calculations, banks are now allowed to use an average of assets over the previous four years and the current year’s assets, benefiting rapidly growing institutions. The FHLBB’s implementation of net-worth certificates assists the least-healthy banks (at the cost of the more healthy) compared to the FDIC’s implementation (GAO, 1984). New thrifts are given 20 years to reach the required capital levels, so an entrant into the industry needs to have initial net worth of only 0.15 percent of assets. Thrift owners at this time who are also land developers can deed difficult-to-value land or other assets as capital contributions (Akerlof and Romer, 1993).

New S&L charters grow as a result of deregulation. Observers describe a contempo-

¹⁰James Tobin recalled the reply when William Seidman of the FDIC asked the White House for more regulators: “Perhaps you don’t understand what administration you are working for.” (Akerlof and Romer, 1993)

aneous growth in aggressive business practices, gambling through lending (engaging in speculative loans in thinly capitalized institutions or investing in real estate outright), and outright fraud (FDIC, 1997). There is a thin line between bad investments (breaches of a duty of care) and fraudulent, criminal behavior. Many of the obituaries of the crisis explore the latter; in the words of one account, “examinations of the operation of many such thrifts show that the owners acted as if future losses were somebody else’s problem” (Calavita et al., 1997). As it turns out, they often were.

1989 marks the final phase of the crisis with the passage of the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA). FIRREA brings with it a change in supervisory oversight and removes the variation in regulatory polices: the FSLIC is closed down and the FDIC assumes responsibility for the insurance activities of the FSLIC, while supervisory oversight of Savings and Loans is removed to the new Office of Thrift Supervision (OTS). FIRREA ensures adequate capital for closing financial institutions, abrogates existing forbearance agreements, re-constricts bank mandates to pre-forbearance levels (e.g. no junk bond investments), and introduces the Resolution Trust Company (RTC) for faster resolution of ostensibly dead but not-yet-failed institutions.

Typically the financial crisis researcher’s challenge is to disentangle the effects of bank failures from the effects of aggregate demand changes, as crises are typically accompanied by negative changes in economic output (Demirgüç-Kunt et al., 2006). The Savings and Loan crisis is one of the few instances where we observe a large number of bank failures contemporaneous with positive output growth (Claessens and Kose, 2013). A nationwide drop in output growth eventually occurs in the U.S. in 1990-1991, almost a decade after the start of en-masse forbearance of troubled financial institutions.

4 Measuring Forbearance and Description of Dataset

In this section, I describe the dataset and the key treatment policy variable used in analysis. The main historical dataset, obtained from the FDIC, combines quarterly Thrift Financial

Reports (for FSLIC-insured institutions) and Call Reports (for FDIC-insured banks) filed from the first quarter of 1984 onwards. This data starts two years into the seven years of the official policy of forbearance owing to the start date of quarterly thrift financial reporting.¹¹ These are institution (bank company) level financial reports providing balance-sheet information. Forbearance is measured from the first date thrift report data is available (Q1 1984), to the introduction of the Resolution Trust Corporation (RTC) and the end of the FSLIC in 1989. Using the dataset, I generate a measure of forbearance of insured institutions located inside the 50 states.¹²

4.1 Definition of Capital Forbearance

I calculate a measure of forbearance of financial institution i at the end of year t as specified in (1). This is a simple capital-based measure of forbearance. Forbearance occurs if an institution is under 5% equity capital at the beginning of a year and not closed by the end of that year. I then asset-weight these occurrences across a state, sum over the observation period, and divide by the total assets in a state.

$$forbearance_{ist} = \mathbb{1}\{Equity_{it}/Assets_{it} < 0.05, \neg failure_{ist}\} \quad (1)$$

$$f_{st} = \frac{\sum_{i \in I_{st}} forbearance_{ist} \cdot Assets_{it}}{\sum_{i \in I_{st}} Assets_{it}} \quad (2)$$

$$F_s = \sum_{t=1984}^{1988} f_{st} \quad (3)$$

Here, i indexes the institution, s indexes the institution's state, t indexes the year, I is the set of financial institutions, $failure$ is a binary indicator set to 1 if institution i fails,

¹¹The start date of the institutional data (1984) happens to coincide with the Reinhart-Rogoff timing of the start-date of this crisis.

¹²More limited archival data was retrieved from the National Archives for Savings & Loan assets prior to 1984, and merged with limited pre-1984 FDIC reporting to generate the pre-crisis instrumental variable of the FSLIC share of banking assets in a state.

annual forbearance f is an asset-weighted sum of forbearance, and F is a cumulative sum of forbearance over the 1984-1988 period.¹³ All variables are as of the beginning of each period, other than failure which indicates if an institution fails during period t .

A geographic heat-map of F_s , the resulting forbearance measure, is presented in Figure 4.

4.2 Key outcome variables

The key state-level economic outcomes I examine are growth rates in real GDP, supplied by the US Department of Commerce’s Bureau of Economic Analysis (levels of which are available from 1977 onwards); House Price Appreciation (HPA) from Core Logic (similar results are found using data from the Federal Housing Finance Agency) from 1977 onwards; business bankruptcy filings from the American Bankruptcy Institute available from 1980 onwards (converted into per-capita rates). Job destruction and job creation rates¹⁴ from the Census Bureau Business Dynamics Statistics (BDS). New business establishments are also provided by the US census. Figure 5 charts median levels of these outcome variables over time.

To shed light on channels for the relationship between forbearance and the real economy, I obtain patent filings from the USPTO, building permits and homeowner vacancy rates from the U.S. Census, total resolution costs associated with criminal cases from [Akerlof and Romer \(1993\)](#), commercial real estate vacancy rates from REIS, and total resolution costs from liquidating failed institutions from the FDIC. To improve comparability across states for variables such as patent filings, I normalize these outcomes as a share of pre-crisis real GDP (1977).

Table 1 presents a summary of independent and dependent variables. Panel A’s independent variables are observed at the institutional-level (the institution submitting a call

¹³Results are similar whether including or not including failure surprises from 1989.

¹⁴Job creation (destruction) rates are defined in Census calculations as the number of jobs created (destroyed) in period t divided by the average number of employed individuals in periods t and $t-1$.

report) and cover the period from the beginning of 1984 to the end of 1988. Bank-level variables are winsorized at the 1st and 99th percentiles. “High-risk loans” are a regulatory definition and include acquisition, development and construction (ADC) loans, large multifamily (5+ units) loans, and commercial (non-farm) real estate.

5 Empirical Methodology and Identification Strategy

I examine the relationship between the state-level measure of forbearance, F_s , and state economic outcomes, addressing potential endogeneity by using two instrumental variables. One instrument is a natural measure of the pre-crisis exposure of a state to forbearance: the share of its banking assets insured by the FSLIC. The other instrument exploits within-FSLIC variation between regulatory districts in their operational styles and speed to resolve failed institutions.

The first and second stage regressions are:

$$F_s = \alpha + \beta^1 ShareFSLIC_s + \beta^2 \bar{F}_{-s}^d + BEARegion_s + \gamma' X_{st} + \varepsilon_s \quad (4)$$

$$y_{st} = \alpha_s + \alpha_t + \delta^0 \mathbb{1}\{t \geq 1982\} \hat{F}_s + \delta^1 \mathbb{1}\{t \geq 1989\} \hat{F}_s + BEARegion_{s,t \geq 1982} + BEARegion_{s,t \geq 1989} + \gamma' X_{st} + \varepsilon_{st} \quad (5)$$

Here, y is the economic variable of interest (e.g. real GDP growth), F is the continuous Forbearance treatment variable as estimated in equation (3), s indexes the state, t indexes the time period, α_t and α_s are time and state fixed effects respectively, X is a vector of controls for robustness tests, and ε is an error term. The variables of interest are δ^0 and δ^1 , representing the estimates of differential effects of forbearance after the start of forbearance and after the end of forbearance respectively.

I cluster standard errors by state to allow for serial correlation in state-level errors. Regressions are estimated with both weighted and ordinary least squares. Weights used for WLS are the size of a state’s economy at pre-crisis (1977) GDP levels. There are many

reasons to focus on a weighted analysis: measurement problems with interstate commerce (where errors are likely to be greater with smaller states), the relevance of trade compared to a particular state's banks, and the fact that a small state's outcome may depend largely on a single industry or event.¹⁵

5.1 Instrumental Variables

My first instrumental variable is the pre-crisis (1979) share of banking assets insured by the FSLIC ($ShareFSLIC_s$). The second instrumental variable \bar{F}_{-s}^d is the average of forbearance in FHLB district (d) that state s lies in, excluding s . In order to not pick up some overall geographic relationship, first stage regressions allow different regions to follow different economic paths, interacting region dummies with the same time-period indicators as are interacted with the policy variable of interest.

The first instrumental variable is relevant owing to historical diffusion of thrift charters. Savings banks arrive in the U.S. in Philadelphia in 1816 and their further diffusion (outside of geographic proximity to Philadelphia) is largely a puzzle to financial history researchers.¹⁶ Between 1820 and the 1870s, savings banks are the fastest growing financial intermediary in the United States, at their peak controlling approximately a quarter of the banking assets in the United States. Subsequently, Savings & Loans prove more popular particular in the South and West of the country. There are no common reasons, and hence no clear economic reasons, suggested in the literature for the early but more limited later success of savings banks. Some previous suggestions include i) the timing of urban growth in a state given the later, more successful, arrival of community banks and savings and loans (with broader product offerings at the time), and ii) potential cultural differences in regional preferences for what might have been seen as a more paternalistic institution (Wadhvani, 2011).

¹⁵Alaska is an example of what I want to avoid in equal-weighted analysis: Alaska has a very small number of banks (ranging from 22 to 11 over this time period), and a large exposure to the energy industry, experiencing a crash in oil prices in the mid-1980s.

¹⁶A total list of states with charters is: Alaska, Connecticut, Delaware, Florida, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Washington, Wisconsin, and Vermont.

Historically, the limited diffusion of savings banks means that by 1980, two similar types of financial institution are covered by two different regulatory authorities. State savings banks are insured and supervised by the FDIC, Savings and Loans by the FSLIC. During the Savings and Loan crisis, the FSLIC is forced to engage in forbearance as a result of its underfunded position and the “too many to fail” nature of its thrift problem.¹⁷ Consequently, states with greater amounts of banking assets covered by FSLIC deposit insurance experience greater forbearance.

The exclusion restriction is that, controlling for other observables such as overall economic region, the amount of pre-crisis S&L assets in a state is unrelated to changes in economic outcomes arising specifically during the S&L crisis, outside of any effect through differences in regulatory policy.

The second instrumental variable I use exploits the style and operational differences between regulatory districts. Each state lies in one of twelve Federal Home Loan Bank (FHLB) districts. FHLB districts are drawn up in 1932, with headquarter locations chosen so as not to coincide with Federal Reserve Bank locations. An FHLB is a legal entity with its own management, employees, board of directors, financial statements, and owners. In 1985, the bank board in D.C. transferred bank examination to the FHLBs in order to circumvent federal budget restrictions. As a result, individual FHLBs have an even greater degree of heterogeneity in staffing levels, speed of recruiting new staff, and organizational approaches, all of which result in variation in the ability to fail troubled institutions promptly. This instrumental variable is informed by discussion with professionals involved in resolution management who highlight regional style differences and non-capital reasons for slow resolution speeds. I control for BEA region, leading to an exclusion restriction that the amount of forbearance in neighboring states in a regulatory district is unrelated to within-region differences in a particular state’s economic outcomes during the S&L crisis, outside of an effect through regulatory policy.

¹⁷ “The FSLIC’s extensive use of forbearance is a result of an inadequate insurance fund in an industry in which many institutions were insolvent.” (FDIC, 1997)

When I quantitatively check for balance by regressing ex-ante economic observables on $ShareFSLIC$ and \bar{F}_{-s}^d in Table 10, I find no immediate significant differences associated with the share of FSLIC assets or the average of forbearance in the regulatory district excluding a particular state. I test the instruments separately and find null results for 1977 GDP level, the state’s economic “leverage” (ratio of banking sector assets to GDP), 1977 population, and the Herfindahl index of bank assets in a state, an indication of the banking concentration in a state. In addition, I check for industry exposures (Mining and Energy, Construction, Manufacturing, Transport, Trade, Service, Finance, Government). In total, out of 24 regressions of these ex-ante observables on the two instrumental variables, two are statistically significant at less than the 0.05 level: pre-crisis employment in the Mining/Energy is negatively related to the instrumental variables.

6 Results

Table 2 presents the main results of this paper: the estimated effects of forbearance on annual real output (GDP) growth. Table 2 estimates the time-varying relationship of forbearance to outcomes after the official policy of capital forbearance starts in 1982 and after forbearance ends in 1989. While point estimates of the relationship during forbearance are positive, there are negative, large, and statistically significant differences in GDP growth in the post-forbearance period.

The economic magnitudes of these estimates are that a one standard deviation increase in observed forbearance is associated with between an average 0.7% and 1.44% lower annual growth rate in real GDP in the years following forbearance (Columns (1)-(6)). This compares with a mean annual growth of 3% in the 20 years of the dataset.

Columns 1-2 present estimates using the IV of pre-crisis share of banking assets insured by the FSLIC—the fund that had a binding “too-many-to-fail” constraint and respectively went easier on its undercapitalized thrifts. Columns 3-4 present estimates using the average forbearance in a regulatory district outside of a particular state as an instrument. Columns

5-6 present estimates using both IVs. All specifications allow the general region of a state to have a time-varying relationship with outcomes, flexibly controlling for covarying economic growth by BEA region by interaction region indicators with time period indicators.

The magnitudes are similar for both instruments, while statistical significance varies. The difference between OLS and WLS estimates provide a larger difference in magnitudes (post-forbearance point estimates are -1% and -1.9% on average respectively), and WLS estimates are associated with a better statistical fit. The relevance of each individual instrument's tends to be corroborated in the data, with Kleibergen-Paap test statistics tending to be approximately 10 or greater apart from one specification. While the instruments could conceivably have different LATEs, they do not reject each other in a test of overidentifying restrictions. I therefore focus on results from both instruments, and, given the expectation of smaller measurement errors with larger states, and interest in national (weighted, aggregate) outcomes, I present weighted least squares estimates for the remainder of this paper.

Any choice regulators may have exercised of where to allocate forbearance could potentially bias naive OLS estimates. Accounts of the crisis, however, depict regulators overwhelmed and caught off-guard by the first systematic banking problem since the Great Depression. A bias from regulator behaviour could be positive or negative: on the one hand, we might expect regulators to pick more distressed areas for forbearance in order to avoid recognition of transient losses, waiting until asset valuations and the economy have reverted to "normal" levels. This would attenuate point estimates of post-crisis estimates to zero. On the other hand, if regulators had misguided views of growth processes or perversely choose to fail banks in states where conditions are immediately negative, then regulators would pick exactly those regions for forbearance where growth might be increasing intra-forbearance, and then liquidate assets after growth and prices fall in other areas, increasing losses. Empirically, it turns out that the naive estimates of OLS are similar to 2SLS results.

I perform a series of additional robustness checks to address alternative explanations and measurement questions. The relationship to real GDP growth holds using various shorter cutoff points for analysis; controlling for lagged GDP; allowing resolution costs to independently act as a separate treatment variable during/after forbearance; allowing Gas/Oil industry share of GDP as a separate treatment variable; removing Delaware and South Dakota; and allowing the overall level of undercapitalized institutions to compete as an additional treatment variable. Appendix Table I summarizes these results.

The estimates of Table 2 describe an economically significant, cyclical, relationship of forbearance to aggregate output growth. Under more consistent regulatory policy, the estimates suggest GDP growth may not have been quite as high in the mid 1980s, but may have avoided turning negative in the early 1990s, if there were no general equilibrium considerations and using states with savings bank charters as the counterfactual FSLIC Share for all states.

At first glance, a negative long-term association with output growth is reminiscent of previous studies of forbearance in Japan, where inefficient, government-encouraged, forbearance of commercial borrowers propped up inefficient competitors and led to lower efficiency through ‘sclerosis’ and ‘scrambling’ (Caballero et al., 2008). In the US, in contrast, we find greater “creative destruction” – both job creation and job destruction rates are higher, not lower, with forbearance.

Table 3 condenses the analysis of Table 2 across other key annual outcomes in the real economy: bankruptcies, new business establishments, job creation and destruction, and house prices, new building permits, and patent filings. During the period of forbearance, higher forbearance states have positive point estimates for all of these other outcomes other than bankruptcy filings. During forbearance, the relationship is statistically significant for job creation and destruction, new establishments, new building permits, and patent filings. Moving from the 25th to the 75th percentile of forbearance is associated with approximately 0.5% greater job-creation, job-destruction, a 0.5 greater z-score in new firm

starts, 8 p.p. more building permits as a share of GDP, and 0.06 p.p. more patent filings. After forbearance ends, the relationship is statistically significant and negative for HPA, and positive for job destruction. Moving from the 25th percentile of forbearance to the 75th percentile is associated with approximately -4% HPA, 3/10,000 more corporate bankruptcies, and a 0.5% higher job-destruction rate after 1989. These estimates compare to sample averages of 6%, 3/10,000, and 1% respectively.

7 How Could Regulatory Forbearance Affect the Real Economy?

“We have developers sitting there with empty buildings, and the lenders are giving them money to start another one. I have to blame the lenders. I want them to show me where these builders are going to get cash flow.... The laws of supply and demand are not governing market behavior. Continuing construction in the face of high vacancy seems related to the availability of financing for new buildings, rather than need.”¹⁸

How can regulatory forbearance affect economic growth? The estimated relationship with forbearance (F_s) captures not just a lack of otherwise-expected bank failures, but any endogenous responses in bank behavior. Many non-mutually exclusive models are potentially relevant to the economic consequences of less-capitalized-than-usual financial intermediaries, lending and competing in an uninhibited fashion. I consider 1) a supply-side induced leverage/collateral cycle; 2) moral hazard; 3) other agency reasons for troubled banks making bad loans (e.g. earnings management); 4) inhibited creative destruction in product markets; 5) fraudulent activity by management/shareholders (“looting”); and 6) fire sales.

¹⁸Wayne Swearingen of Swearingen Co., a Dallas real estate firm, as quoted by [Akerlof and Shiller \(2015\)](#).

7.1 A supply-induced leverage and collateral cycle

The concept of a leverage cycle, or collateral-driven business cycle, is not new (Geanakoplos, 2001; Kiyotaki and Moore, 1997) and empirically established in historical studies (Jordà et al., 2013, 2014; Leamer, 2007). If forbearance forestalls the recognition of some negative shock, it could simply extend a credit expansion with a larger subsequent crash. The model of Gorton and Ordoñez (2012) describes a dynamic where the longer the period investors have not questioned the quality of collateral before a (small) shock arrives, the larger the boom as well as subsequent crash. A broader drop in aggregate output growth associated with a sharp decline in real estate values is consistent with real estate's frequent role as collateral and frictions in the credit channel. A drop in collateral value can impair both borrowers' and banks' balance sheets, raising the effective cost of bank capital and credit in general (Fisher, 1933).

Making the connection from credit to the real economy, Table 3 found that forbearance was empirically associated with greater new construction, but a larger drop in house prices after forbearance ends. Table 4 examines bank lending and finds forbearance is associated with greater high risk lending and mortgage lending on average. One standard deviation in forbearance is associated with an approximately 10% greater share of balance sheet dedicated to High Risk Loans. This compares to a 0% baseline as this was a product type that thrifts could not engage in prior to the crisis. In contrast, when turning to examine lending to corporations and small businesses (C&I loans), I find no significant differences. Table 5 formally tests whether forbearance of banks potentially over-stimulated activity in real estate. Data availability for the time series of owner vacancy rates and vacancy rates in Commercial Real Estate (CRE) - apartment buildings specifically - is over a much shorter time span and not universally available (the CRE data is only available for MSAs in 29 states). At the same time as being causally associated with new building and permit applications, point estimates for forbearance indicate increasing vacancy rates. One standard deviation in forbearance is associated with between 0.5% and 0.9% increase in

vacancy rates, compared to standard deviations of 0.75% and 2.7% in the two time series (residential and Commercial apartment vacancy rates) respectively. While statistical significance varies, the evidence appears consistent with forbearance-exacerbated speculation in real estate.

Table 6 examines possible dynamics in bank asset and accounting performance. The beginning of forbearance has no significant estimated effect on indicators of non-performing loans or Real Estate owned (REO) on bank balance sheets, even though vacancy rates appear to be increasing from Table 5. These traditional indicators of distress are not greater in regions with greater forbearance. After forbearance ends, however, these indicators turn strongly negative - REO as % assets is 0.5% greater on average and non-current assets almost 1% greater for a one standard deviation in forbearance, compared to sample averages of 0.6% and 1.8% respectively.

7.2 Moral Hazard (institution-level, equity-based incentives)

When considering the choices a highly levered financial institution faces with a government guarantee of its debts, the classic model that presents itself is moral hazard. A common narrative of the S&L crisis—and many others since—is that high leverage prompts banks to make “Tails I win, heads you lose” bets. Contemporary anecdotal examples of unwise or socially undesirable loans included junk bonds and housing construction in the middle of the Arizona desert. Under moral hazard, we would expect that banks in the worst equity positions, who receive the most forbearance, to engage in greater degrees of speculative lending.

While these results are purely correlative, at the institution-level, I find the evidence does not support a simple model of shifting incentives to equityholders. Table 7 tests if the amount of high risk loans in an institution’s portfolio increases as its equity position decreases, and also separates out institution-level forbearance from the overall forbearance a state is receiving. Higher equity ratios are associated with fewer high risk loans overall,

but –most importantly- below 5%, it is banks higher in capital ratio and closer to the cutoff that hold more high risk loans on average. This could be consistent with gambling to get on the other side of a cutoff. We do not find evidence consistent with the prediction from a simple model of moral hazard.

Column 2 of Table 7 find that the overall state-level forbearance has separate explanatory power. Other banks in a state could be “brought along” by the overall level of forbearance, regardless of their own equity ratios, and forced to compete for business and reported profits, offering new loan products. Controlling for bank-level capital, one standard deviation in a state’s level of forbearance is associated with 5% greater share of balance sheet dedicated to high risk loans. The evidence is consistent with more speculative lending being partially determined by the general levels of forbearance in the local banking industry. This is consistent with models of (troubled) banking industry equilibriums such as (Gorton and Rosen, 1995; Rajan, 1994).

7.3 Other Reasons for Bad Loans

Apart from a minimal equity interest, there are a number of potential other reasons that managers in a troubled banking industry might misallocate capital. One reason to make negative-expected-value loans is to improve reported profits. Rather than gambling for redemption, by growing into more speculative real estate lending activities, such as “High Risk” commercial loans for the Acquisition, Development, and Construction (ADC) of residential properties, a bank can essentially make its own luck and influence accounting (non-economic) returns, at least in the short run (Rajan, 1994).

ADC loans are typically structured at high (100%) LTVs and incorporate Paid-in-Kind (PIK) interest, pre-paid interest, or no interest for the initial years (Akerlof and Romer, 1993). These loans lack repayment monitoring mechanisms other than their short maturity, which is obviated in the presence of continued easy refinancing.

When instituting capital forbearance in 1982, the Bank Board creates additional short-

term capital incentives for influencing collateral values by moving to use the better of appraised or book equity value. Without more careful oversight, a thrift making ADC loans can guarantee itself accounting income. By continuing to lend against collateral, banks can prop up transaction and appraisal values used in the regulatory accounting of their capital.

If forborne banks are lending into worsening fundamentals, we would expect to see increasing vacancy rates coincident with forbearance. This appears to be the case. Using data currently available from 1986 onwards on residential properties - the end product of ADC loans –Table 5 finds vacancy rates are increasing at the same time as greater construction and lending against construction. Banks appear to be switching into riskier loans in the face of worsening fundamentals.

7.4 Lack of Creative Destruction

Lending under the U.S. policy of capital forbearance does not appear to mirror Japan’s lost decade, outside of evidence of a misallocation of credit. Results in Japan appear to be associated with stifling innovation and a lack of healthy industry participant turnover. In the US, we observe relatively higher job creation and job destruction rates, as well as greater business starts and patent filings during the period of forbearance (Table 3).

7.5 Looting

Another alternative interpretation of the crisis is that, at some point, a lack of capitalization led to a lack of care in lending. At some point, it is simply more efficient to engage in outright criminal/fraudulent activity such as tunneling for private benefit or “looting” and this was especially associated with S&Ls (Akerlof and Romer, 1993). Table 6 first shows no relationship between forbearance and dividend payouts over time. The size of an approximately constant difference is small (at its highest approximately 0.1% of assets) and there is no time-varying trend during the period for which data is available.

A more direct test that avoids conflating shareholders with management is to examine whether forbearance is related to bank failures where criminal prosecution was cited by regulators. Table 8 performs this test and finds no strong relationship between my measure of forbearance and the dollar amount of bank assets involved in criminal prosecutions of bank management or owners of S&Ls, normalized either by pre-crisis GDP or total crisis resolution costs for a state.¹⁹

7.6 Fire Sales and Overall Financial Distress

The final mechanism I consider is a difference in the nature of failures. If failures were better-handled prior to 1989, for example, we might pick up the effect of additional losses through forced closures and fire sales of banking assets (Shleifer and Vishny, 2010), or some effect of the overall distress in a state.

Table 9 repeats the same main (instrumented) analysis of Table 2 with total crisis failure costs on the left hand side—both in volume of assets and dollar resolution costs (losses on the principal balance of bank assets), normalized by a state’s 1977 GDP. I find no clear prediction of total failures or failure costs by F_s . In addition, the total amount of failures do not appear to sap explanatory power of the relationship to real GDP growth (tabulated in Appendix Table I). Holding the overall amount of financial distress in a state constant, the relationship of forbearance to economic growth holds.

7.7 Summary of Channel Evidence

Many of the documented facts are consistent with a model of credit-exacerbated speculation, where banks are incentivized to lend against specific projects to maintain their earn-

¹⁹Another straightforward, but untestable, reason for a growth in negative value loans, often offered anecdotally by both professionals and economists involved in regulatory clean-up and examination of the S&L crisis, is incompetence. Under regulatory forbearance, bank managers are required to grow their way out of their problem and into new higher return activities (in order to sufficiently improve their capital position). Dealing with commercial real estate lending may not have been a pursuit the thrift industry was ready for.

ings or improve their capital positions. There is an asymmetry in the effects on broader economic activity comparing the intra-forbearance period (1982-1989) to subsequent years - estimated effect sizes tend to be larger in the post-forbearance period. When capital controls are re-implemented in 1989, the role collateral plays in the extension of credit might be especially prominent, given the impairment of both banks' and borrowers' balance sheets, exacerbating (and exacerbated by) further reductions in leverage.

8 Conclusion

In this paper I have empirically described a time-varying relationship between regulatory forbearance and real GDP growth during the U.S. Savings and Loan Crisis. I have delivered a series of estimates of the real effects of regulatory forbearance: some positive and immediate, others negative and larger in magnitude.

In the S&L crisis, the economic paths of states diverge after the policy of regulatory forbearance begins in 1982. Forbearance is estimated to lead to relative expansions in high risk credit and to have initial seemingly positive impacts on some aspects of commercial and real estate activity, although this does not statistically register in aggregate output growth. Ultimately though, after regulatory oversight is consolidated and the policy of forbearance ends in 1989, high forbearance states suffer asymmetrically larger and clearer declines in house prices and aggregate output growth. These negative differences in real GDP coincide with the nationwide recession in 1990-1991.

This paper contributes an identification strategy for the economic effects associated with regulatory forbearance. I improve upon existing cross-country identification of financial crisis policy by exploiting the within-country regulatory experiment provided by a specific crisis. The findings provide quantitative evidence for bank lending distorting financial and economic outcomes—a claim made by casual observers at the time of the S&L crisis. These effects do not appear to be as simple to explain as moral hazard by individual, under-capitalized banks; or by the overall amount of failures a state experiences.

A growing empirical literature finds evidence for a bank-borrower relationship where banks pass their problems onto borrowers during crises. I document another side to the bank-borrower relationship: banks can pass on the “easy credit” of a deregulatory *carte blanche*, temporarily stimulating certain sectors of the economy.

Figure 1 Simplified Diagram of U.S. Bank Supervision in 1980

This figure illustrates the two different supervising entities and deposit insurers (the FDIC and FSLIC) of thrift banks (Savings Banks and Savings and Loans) at the beginning of the S&L crisis. The structure shown remains in place until 1989. “FHLBB” refers to the Federal Home Loan Bank Board, of which the FSLIC was a subsidiary and only insured S&Ls. “FRB” is the Federal Reserve Board, “FRS” refers to the Federal Reserve System. “OCC” is Office of the Comptroller of the Currency.

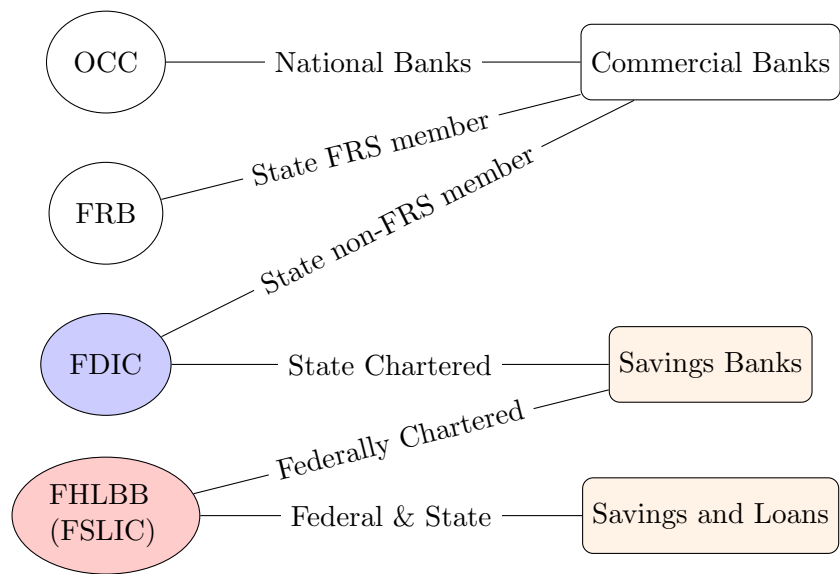


Figure 2 Real GDP Growth Associated with Forbearance

This figure plots mean real GDP growth by forbearance status of a state. “High Forbearance” is a binary indicator set to one for states in the top quartile of Forbearance as defined in equation (3). The official forbearance period shaded in grey is 1982-1989.

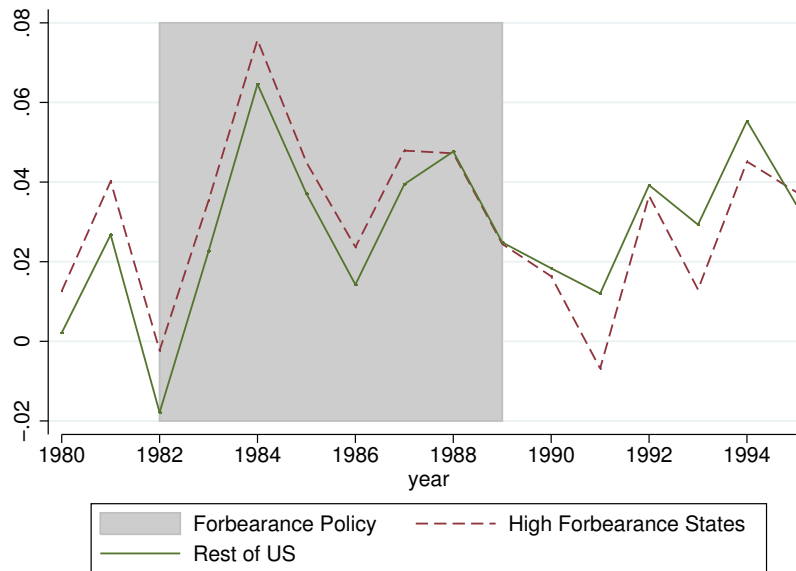


Figure 3 House Price Appreciation Associated with Forbearance

This figure plots mean House Price Appreciation (HPA), where “High Forbearance” is a binary indicator set to one for states in the top quartile of Forbearance as defined in equation (3). The official forbearance period shaded in grey is 1982-1989.

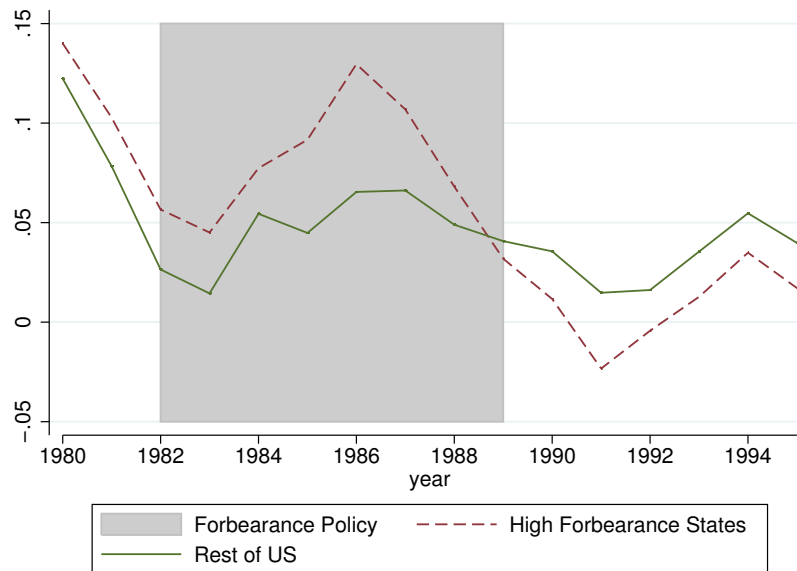


Figure 4 Geographical Variation in Regulatory Forbearance

This figure illustrates the geographic distribution of F_s (as defined in equation (3), uninstrumented). The darkest red states have the highest estimated “asset-years” of forbearance.

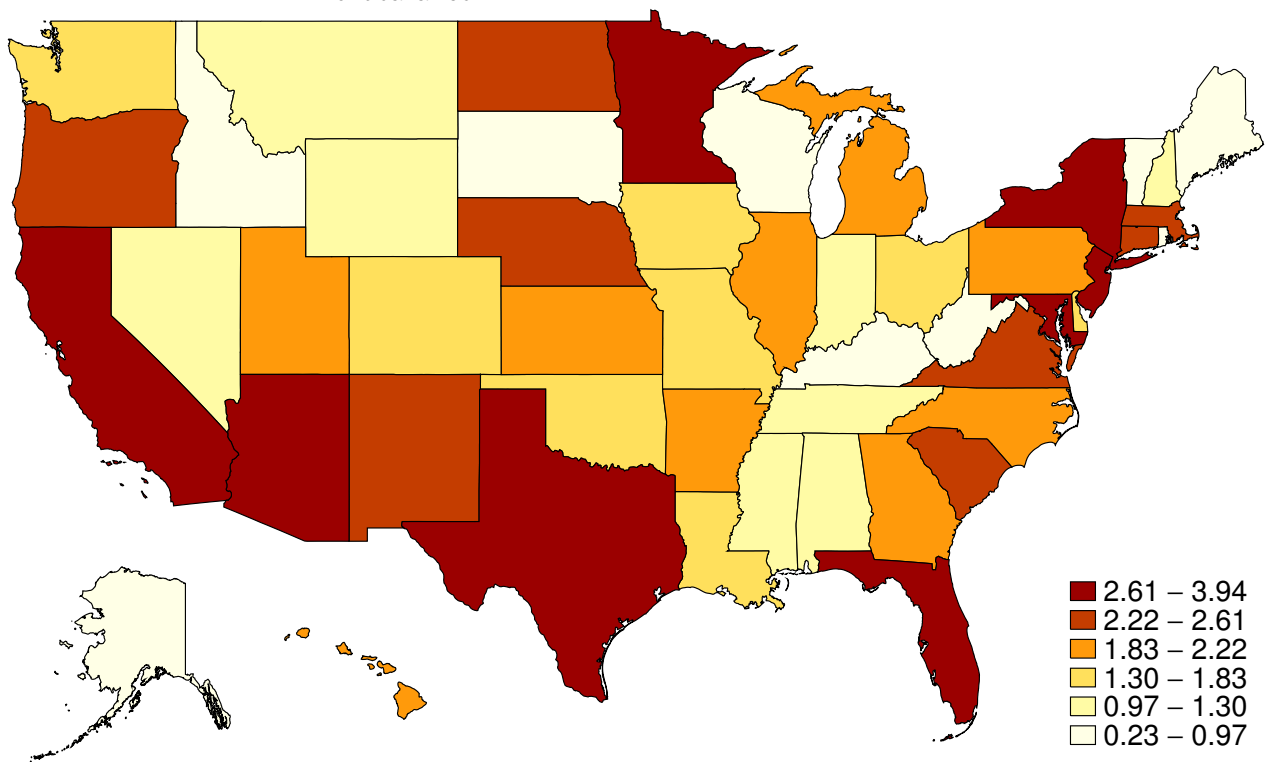


Figure 5 Medians of Economic Time Series

This figure plots medians of state-level economic time series. New business starts and Business Bankruptcy (BK) filing rates are normalised: new business establishments are z-scores constructed at the state level, business bankruptcies are presented as the number of filings per 10,000 population.

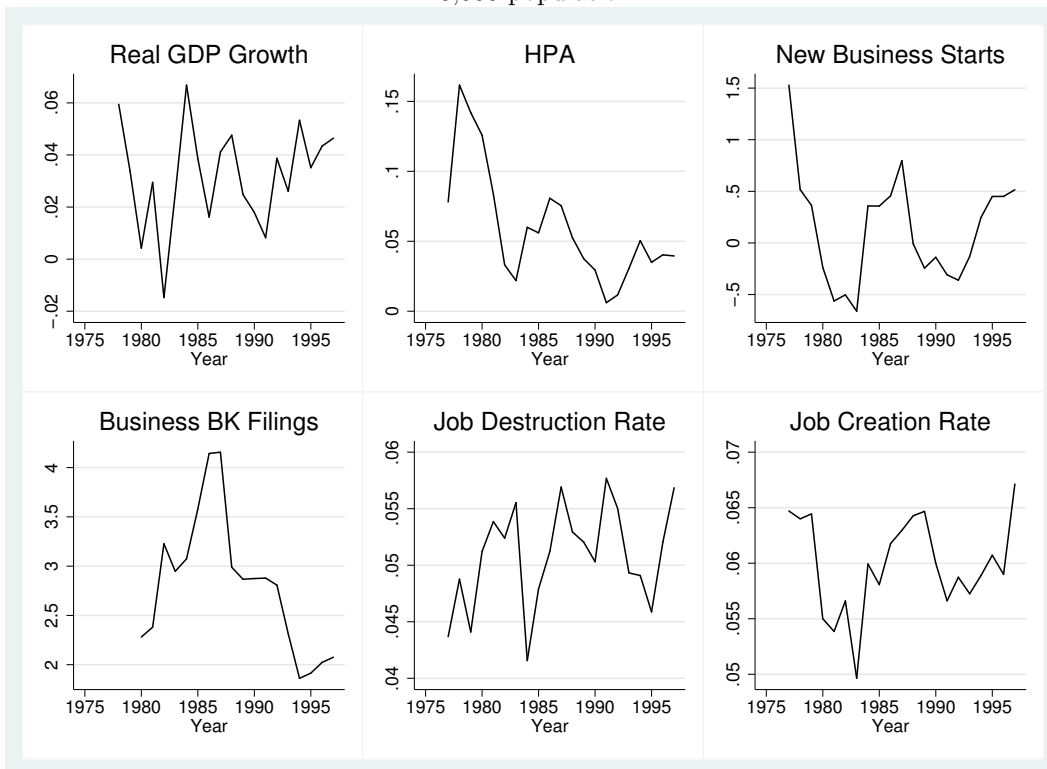


Table 1 Summary Statistics

The table presents the number of observations, mean, standard deviation, minimum and maximum of each variable.

Variable	#Obs	Mean	Std. Dev.	Min	Max
Institution-level					
Assets (\$mln)	88,864	222	1,944	0.342	154,000
Equity (\$mln)	88,864	12	95	-1,287	8,009
Non-perf. Asset Ratio	87,959	0.017	0.028	0.00	0.88
$1\{\textit{Below 5\% Equity Capital}\}$	88,864	0.15	0.36	0	1
Residential mortgages/Assets	88,864	0.20	0.20	0	1
High Risk Loans/Assets	88,864	0.19	0.14	0	1
ROA	88,589	0.005	0.0214	-0.88	0.89
NIM	88,582	0.041	0.022	-0.53	4.0
State-level					
Growth in real GDP	1000	0.03	0.03	-0.06	0.11
HPA	1050	0.06	0.07	-0.16	0.39
New Firm Starts (z-score)	1050	0.0	1.0	-3.57	3.84
Business Bankruptcy Filing Rate (per 10,000 capita)	900	2.80	1.82	0.14	16.23
Job Destruction Rate	1050	0.05	0.01	0.03	0.10
Job Creation Rate	1050	0.06	0.01	0.03	0.12
Pre-Crisis FSLIC Share of Bank Assets	50	0.27	0.10	0.06	0.53
Forbearance (F_s)	50	1.83	0.86	0.23	3.94

Table 2 Relationship of Forbearance to Output Growth

This table reports estimates of 2SLS regressions, defined in equation (4) of the text. The dependent variable (real-per GDP growth) is observed at the state level. F_s is the state-level Forbearance measure as defined in equation (3). The instruments used in the first stage are i) the pre-crisis share of banking assets covered by the S&L-only deposit insurance fund, FSLIC ii) the average forbearance in a state’s FHLB district excluding that particular state (F_{-s}^d). “Post-1982” is a binary indicator for the period forbearance began as an official policy, and equals 1 for the years 1982 onwards, 0 otherwise. “Post-1989” is a binary indicator for after forbearance ends as an official policy, equalling 1 for the years 1989 onwards, and 0 otherwise. “BEA Region” refers to Bureau of Economic Analysis region. WLS estimates use 1977 GDP as state-level weights. Standard errors clustered by state are shown in parentheses. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. + significant at 10% level.

Dependent Variable: Instrumental Variables:	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Pre-Crisis FSLIC %</i>		Real GDP Growth		<i>Both</i>	
	OLS	WLS	OLS	WLS	OLS	WLS
Post-1982 * \hat{F}_s	0.0073 (0.0070)	0.010 (0.015)	0.0030 (0.0051)	0.0038 (0.0030)	0.0054 (0.0055)	0.0046 (0.0034)
Post-1989 * \hat{F}_s	-0.0083* (0.0042)	-0.022+ (0.012)	-0.012* (0.0051)	-0.018*** (0.0039)	-0.0097* (0.0038)	-0.018*** (0.0041)
BEA Region interacted with time-period indicators	Y	Y	Y	Y	Y	Y
Year and State FEs	Y	Y	Y	Y	Y	Y
First-stage Kleibergen-Paap F statistic	20.03	1.99	8.85	25.23	11.80	14.86
N	1000	1000	1000	1000	1000	1000
R ²	0.54	0.64	0.53	0.65	0.54	0.65

Table 3 Forbearance and Other Outcomes in the Real Economy

This table summarizes the second-stage estimates of 2SLS regressions, as defined in equation (4) of the text. The dependent variables (shown in left-most column) are annual outcomes observed at the state level. F_s is the state-level Forbearance measure, defined in equation (3). The instruments used in the first stage are i) the pre-crisis share of banking assets in a state covered by the FSLIC, and ii) the average forbearance in a state’s FHLB district, excluding that particular state. Variables are described in Section 4: “Job Creation Rate” and “Job Destruction Rate” are the number of new jobs and number of lost jobs over the year divided by the average number of jobs. “New business starts” is an in-sample, state-level z-score of new business establishments. “Business BK Filing Rate” is the number of corporate bankruptcy filings per 10,000 capita. “House Price Appreciation” is HPA as measured by CoreLogic. “New Building Permits” are number of building permits as recorded by U.S. Census normalized by 1977 GDP. “Patent Filings” are normalized by 1977 GDP. End date for analysis is 1997, and start dates differ by time series: 1976 for HPA, 1980 for bankruptcy filings, 1977 for job rates, 1977 for patents and 1978 for new building permits. Estimates are presented using 1977 State GDP as weights. Standard errors clustered by state shown in parentheses. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. +significant at 10% level.

	Forbearance		Post-Forbearance		R^2
	$\delta^0(\hat{F}_s)$	Std Err	$\delta^1(\hat{F}_s)$	Std Err	
Job Creation Rate	0.0047**	(0.0014)	-0.00007	(0.0014)	0.78
Job Destruction Rate	0.0039**	0.001	0.0051**	(0.0017)	0.76
New Business Starts	0.42*	(0.17)	0.39	(0.29)	0.55
Business BK Filing Rate	-0.16	(0.13)	0.27 ⁺	(0.14)	0.72
House Price Appreciation (HPA)	0.012	(0.013)	-0.034***	(0.0084)	0.55
New Building Permits	0.065***	(0.019)	-0.0071	(0.038)	0.79
Patent Filings	0.00052**	(0.00017)	0.00073	(0.00090)	0.89

Table 4 Differences in Lending Activity

This table reports the second stage estimates of weighted 2SLS regressions using state-level observations, as defined in equation (4) of the text. “High Risk Loan Share” is total high risk loans divided by banking assets. “Mtg. Share” is total residential real estate loans divided by banking assets. “C&I Share” is total Commercial and Industrial Loans divided by total banking assets. Controls left unreported. Estimates are presented using 1977 State GDP as weights. Eicker-Huber-White standard errors shown in parenthesis. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. + significant at 10% level.

Time Period:	1988	1988	1988
	High Risk Loan Share	Mtg. Share	C&I Share
Forbearance (\hat{F}_s)	0.14** (0.052)	0.15*** (0.029)	0.0077 (0.025)
BEA Region controls	Y	Y	Y
N	50	50	50
R^2	0.67	0.81	0.47

Table 5 Forbearance and Real Estate Fundamentals

This table reports the second stage estimates of 2SLS regressions, as defined in equation (4) of the text. The unit of observation is state-level annual real estate outcomes. “Owner Vacancy Rates” are vacancy rates of residential homeownership as reported by the US Census Bureau. “Apt. Vacancy Rates” are commercial real estate (Apartment building) vacancy rates as reported at the MSA-level by REIS, with averages taken if more than one MSA is provided in a particular state. Controls are left unreported. Estimates are presented using 1977 State GDP as weights. Eicker-Huber-White standard errors are presented in parenthesis. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. +significant at 10% level.

	Change in Owner Vacancy Rate (%)	Change in Apt. Vacancy Rate (%)
Time Period (Data Availability):	1986-1989	1982-1989
Forbearance (\hat{F}_s)	0.49** (0.16)	0.89+ (0.54)
BEA Region controls	Y	Y
N	50	29
R^2	0.28	0.52

Table 6 Bank Earnings and Performance

This table reports estimates of 2SLS regressions of state-level average financial institution financial reporting, as defined in equation (4) of the text. Time period of analysis is 1984-1997. “NIM” is the median Net Interest Margin for financial institutions in that state. Estimates are presented using 1977 State GDP as weights. Standard errors are clustered at the state level and shown in parenthesis. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. +significant at 10% level.

	$\frac{REO}{Assets}$	$\frac{Non-Current}{TotalAssets}$	NIM	$\frac{Dividends}{Assets}$
Forbearance (\hat{F}_s)	-0.00023 (0.00064)	0.0074 (0.0057)	0.11 (0.12)	0.00030 (0.00060)
Post-1989* \hat{F}_s	0.0053*** (0.0013)	0.0089*** (0.0021)	-0.16*** (0.067)	-0.00026 (0.00058)
BEA Region x time period controls	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
N	700	700	700	700
R ²	0.47	0.53	0.72	0.66

Table 7 Bank-level Differences in High Risk Lending

This table reports estimates of OLS regressions. The unit of observation is bank-year, conditional on not failing each year, over the time period 1984-1989. The dependent variable for each specification is High Risk Loans/Total Assets, where High Risk Loans are loans falling into a number of categories as defined by the FDIC (details in Section 4). Standard errors are clustered at two levels, institution and year, and shown in parenthesis. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. + significant at 10% level.

	(1)	(2)
	High Risk Loans/Assets	
$\mathbb{1}\{Below\ 5\%\ Equity\ Capital\}$	-0.027* (0.013)	-0.042*** (0.012)
Equity Capital Ratio	-0.39*** (0.094)	-0.44*** (0.081)
$\mathbb{1}\{Below\ 5\%\} * Equity\ Capital$	1.39*** (0.38)	1.43*** (0.38)
F_s		0.052*** (0.013)
Constant	0.23*** (0.0088)	0.13*** (0.025)
N	84,753	84,753
R^2	0.011	0.054

Table 8 Forbearance and Fraud/Crime

This table reports estimates from the second stage of 2SLS regressions with state-level observations, as defined in equation (4) of the text. The dependent-variables are constructed using the numerator of S&L resolution costs reported by the RTC and FDIC as having involved criminal prosecution, taken from [Akerlof and Romer \(1993\)](#). F_S is the state-level Forbearance measure, defined in equation (3). The instruments used in the first stage are i) the pre-crisis share of a state’s banking assets insured by the FSLIC, and ii) the average forbearance in a state’s FHLB district, excluding that particular state. “BEA Region” refers to Bureau of Economic Analysis region. Estimates are shown using 1977 GDP as state-level weights. Eicker-Huber-White standard errors are shown in parentheses. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. † significant at 10% level.

	(1) Criminal Costs as Share Pre-Crisis GDP	(2) Criminal Costs as Share Total Resolution Costs
Forbearance(\hat{F}_s)	-0.0036 (0.0047)	-0.22 (0.21)
BEA Region Controls	Y	Y
N	50	50
R2	0.28	

Table 9 Forbearance and Resolution Costs

This table reports estimates from the second stage of 2SLS regressions with state-level observations, as defined in equation (4) of the text. Total Failed Assets equals cumulative failures from 1984 to 1993. Resolution Costs are total dollar costs for the crisis as reported by the FDIC. Total Failed Assets and Resolutions Costs are both normalized by 1977 GDP. F_s is the state-level Forbearance measure, defined in equation (3). Instruments used are: i) a state's pre-crisis share of total banking assets covered by the FSLIC and ii) the exclusive average forbearance in that state's FHLB district. Weights used are a state's 1977 GDP. Eicker-Huber-White standard errors are shown in parentheses. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. + significant at 10% level.

	(1)	(2)
	Total Failed Assets as % Pre-Crisis GDP	Total Resolution Costs as % Pre-Crisis GDP
Forbearance(\hat{F}_s)	0.0092 (0.018)	0.0035 (0.0090)
BEA Region Dummies	Y	Y
N	50	50
R2	0.69	0.79

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10 Appendix Table 1: Pre-Crisis Balance of Instruments

	(1) 1977 GDP	(2) Pop.	(3) Leverage	(4) Herfindahl	(5) Mining %	(6) Construction	(7) Manu.	(8) Trans.	(9) Trade	(10) Service	(11) Finance	(12) Govt.
F_{-s}^d	95684.0 (62917.3)	3411295.4 (2430611.3)	34.5 (55.8)	-0.0023 (0.017)	-0.015* (0.0075)	-0.0012 (0.0029)	-0.0079 (0.018)	-0.0037 (0.0027)	-0.000041 (0.0057)	0.035+ (0.018)	0.0059 (0.0051)	-0.013 (0.015)
BEA Region Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
-cons	-49630.4 (75340.1)	-1585776.6 (3061269.1)	213.6* (101.1)	0.10** (0.033)	0.039* (0.016)	0.057*** (0.0054)	0.13** (0.043)	0.065*** (0.0083)	0.20*** (0.022)	0.19*** (0.025)	0.081*** (0.011)	0.24*** (0.048)
N	50	50	50	50	50	50	50	50	50	50	50	50
R2	0.34	0.36	0.30	0.28	0.40	0.46	0.58	0.46	0.46	0.44	0.32	0.32
<hr/>												
	(1) 1977 GDP	(2) Pop.	(3) Leverage	(4) Herfindahl	(5) Mining %	(6) Construction	(7) Manu.	(8) Trans.	(9) Trade	(10) Service	(11) Finance	(12) Govt.
Pre-Crisis FSLIC %	34342.3 (186907.5)	2829913.9 (7275212.6)	-307.4 (280.4)	-0.042 (0.064)	-0.075* (0.037)	0.014 (0.015)	0.000040 (0.098)	-0.022 (0.016)	0.052 (0.035)	0.073 (0.065)	0.032 (0.032)	-0.073 (0.072)
BEA Region Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
-cons	126894.0 (101650.7)	4223213.7 (3853860.3)	376.1** (117.1)	0.11*** (0.029)	0.033** (0.012)	0.051*** (0.0053)	0.11** (0.039)	0.064*** (0.0077)	0.19*** (0.019)	0.23*** (0.032)	0.083*** (0.011)	0.24*** (0.044)
N	50	50	50	50	50	50	50	50	50	50	50	50
R2	0.22	0.27	0.33	0.29	0.41	0.47	0.58	0.48	0.51	0.31	0.32	0.33

I Appendix: Robustness Checks

Table 1 of this Appendix performs a series of additional robustness checks. The results support the main hypothesis. Overall, the main estimates remain largely unchanged: post-forbearance outcomes are worse while there is not a clear statistical difference in output growth during forbearance. In untabulated results I also pursue county level analysis (examining cumulative payroll growth and changes in the number of establishments) and find similar results each way. The robustness tests applied by row of Appendix Table 1 are as follows:

- Row 1 Ends time period under analysis in 1993 to check robustness to time period under analysis.
- Row 2 Ends time period for analysis in 1991.
- Row 3. Adds lagged Real GDP Growth as control to account for AR(1) nature of process.
- Row 4. Controls for exposure to Oil/Energy and the influence of changes in petrol prices by allowing for changes in trend by state-level pre-crisis exposure to energy and oil industries (as share of GDP).
- Row 5. Adds additional treatment variable of the total level of failed institutions (up until 1993, as % pre-crisis GDP), whether promptly failed or not, interacted with post-1982 and post-1989 time period indicators. This is to examine if analysis is picking up simply more or less distressed states.
- Row 6. Examines point estimates if Delaware and South Dakota are removed from the estimation. As pointed out by [Jayaratne and Strahan \(1996\)](#), over this time period these states attracted business from new incorporations and credit card banking respectively.

I.1 Cyclicalilty

A final concern is that forbearance may happen to correlate with pro-cyclical states that experience greater upturns and downturns. One argument against a “pro-cyclical” alternative is that the decrease in bankruptcy filings associated with forbearance is counter-cyclical to the rising national median rates over the period 1982-1989. Another approach is simply to test historical business cycles and see if the suggested pro-cyclicalilty holds - the prediction being that when interacting the IVs with year, we should find negative coefficients during recessions, and positive coefficients in the middle of a business cycle. I test two preceding recessions in the preceding two decades and find no evidence for this. Appendix Figure 1 illustrates that there are not systematically lower-than-normal growth rates associated with forbearance (or the instruments) at the same time as recessions. Over the two recessions during this time period (1969-1970 and 1973-1975), there are three statistically significant point estimates for the instrumental variables, and seven statistically significant point estimates. Similar null results are found for the point estimate of a binary indicator of “recession” for the years of recession. I examine nominal GDP growth owing to the lack of availability of BEA regional deflators prior to 1977.

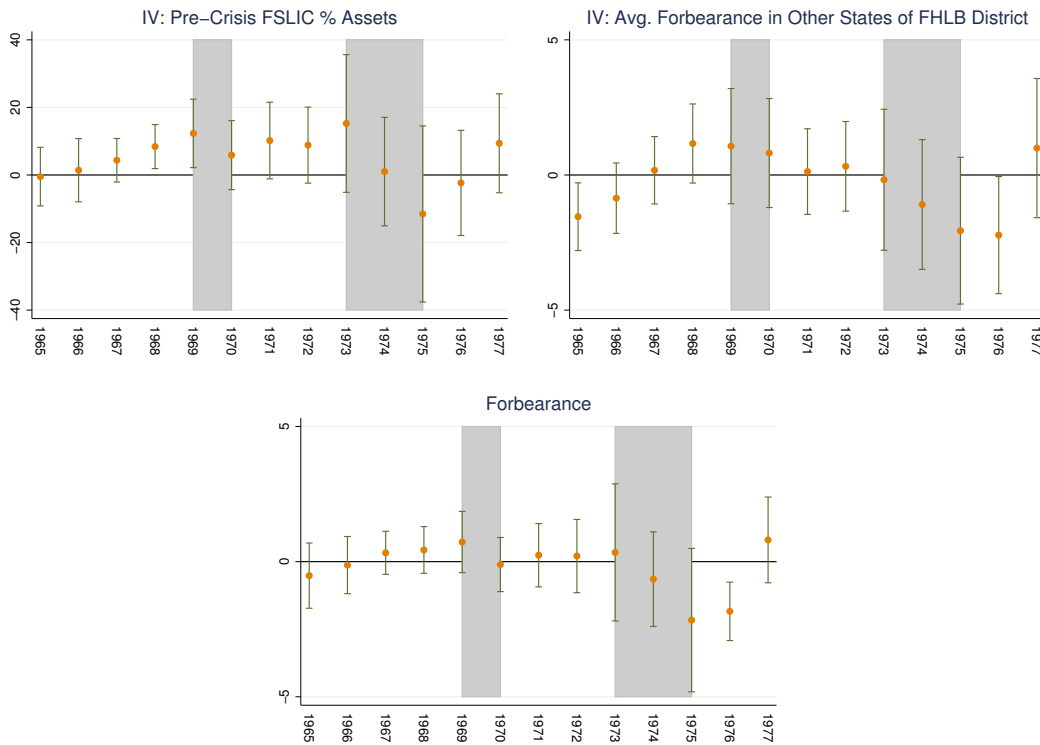
Appendix Table 1: Summary of Robustness Tests

This table reports a summary of multiple weighted 2SLS estimates of (4). Instrumental variables used are an indicator for whether a state offers savings bank charters, and the average forbearance in a state's FHLB district, excluding that particular state. BEA region controls are used throughout. A description of each specific test is shown in bold. Row (1) abbreviates the dataset to 18 years in total, Row (2) shortens the dataset to 16 years. Row (3) adds lagged real GDP growth as a control. Row (4) allows for changes in trend by state-level exposure to the energy and oil industries, specifically using the 1977 share of GDP as an additional treatment variable. Row (5) adds as an additional treatment variable (interacted with time period) the cumulative sum of failed banking assets from 1984-1993. Row (6) compares point estimates with two states removed, which are known to have had unusual growth in financial and economic activity. *** significant at 0.1% level ** significant at 1% level. * significant at 5% level. + significant at 10% level.

Robustness Test	Intra-Forbearance	Post-Forbearance	R^2
	δ^0	δ^1	
1. End analysis in 1993	0.0046	-0.022***	0.71
2. End analysis in 1991	0.0046	-0.022***	0.74
3. Lagged RGDP growth	0.0034	-0.016***	0.68
4. Pre-crisis Energy/Oil GDP (%total) as treatment	0.0030	-0.018***	0.68
5. Distress as treatment	0.005	-0.018***	0.68
6. Remove Delaware and South Dakota	0.0051	-0.019***	0.68

Appendix Figure 1: Relationship of Forbearance and IVs to Output Growth During Previous “Placebo” Business Cycles

This figure graphs the pattern of coefficients from regressions of nominal GDP growth over the period 1964-1977. The main independent variables used are: the share of pre-crisis assets insured by the FSLIC, the average measure of forbearance in an FHLB district, excluding that particular state, and F_s . These are interacted with year indicators (plotted by year below), and estimated with respect to 1964. I present the estimated coefficients after controlling for BEA region as in the main specification. Standard errors are clustered by state and 95% confidence intervals are indicated. The two recessions over this time period are 1969-1970 and 1973-1975, shaded in grey below.



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