

Bank Regulation and Income Distribution:

Evidence from Branch Deregulation

Thorsten Beck, Ross Levine, and Alexey Levkov

This draft: March 2007

Abstract: Policymakers and economist disagree about the impact of bank regulations on the distribution of income. In this paper, we test whether liberalizing restrictions on intra-state branching in the states of the United States from the mid-1970s to the mid-1990s intensified, ameliorated, or had no effect on the Gini coefficient of income distribution. Besides boosting average incomes, branch deregulation lowered income inequality. Furthermore, deregulation reduced income inequality among female wage and salary earners and among the self-employed.

JEL Codes: G28, D31, O16

Key Words: Financial Institutions, Government Policy, Income Inequality, Economic Development

Beck: World Bank; Levine: Brown University and the NBER; Levkov: Brown University. Martin Goetz provided exceptional research assistance and comments throughout. Yona Rubinstein's guidance and suggestions substantively improved the quality of our research, but the many remaining weaknesses are our responsibility. This paper's findings, interpretations, and conclusions are entirely those of the authors and do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.

Throughout the history of the United States, political leaders have argued that large banks only benefit the rich (Hammond, 1957). Besides constitutional considerations, Thomas Jefferson's fears of concentrated banking power spurred him to fight against Alexander Hamilton's Bank of the United States. Similar fears fueled both the successful battle to terminate this bank in 1811 and Andrew Jackson's elimination of the Second Bank of the United States in 1832. Moreover, anxiety that large banks enrich the wealthy at the expense of others spurred states to restrict banks from opening bank branches across state lines and within state boundaries.

The view that large banks primarily help the wealthy also finds support in modern theory and continues to shape bank regulation around the world. For example, Greenwood and Jovanovic (1993) show that banks will primarily assist those wealthy enough to access banks, and most countries regulate the ability of banks to merger, acquire other banks, and participate in securities, insurance, and nonfinancial activities. In the U.S., many intra- and inter-state branching regulations lasted through the mid-1990s with the stated goal of reducing income inequality.

Countervailing arguments, however, challenge the view that restraining the formation of large banks helps the poor. Some theories predict that impeding competition primarily hurts those too poor to afford financial services (Galor and Zeira, 1993; Galor and Moav, 2004). For example, intra-state branching restrictions prevented banks from competing in many areas, which created small banks with local monopolies (Flannery, 1984). According to this view, the lack of bank competition protected firms with close connections to local banks by hindering the formation and expansion of more efficient firms. Indeed, White (1982) argues that the real motivation behind branching restrictions was the desire to protect local banking monopolies and politically-influential groups connected to those monopolies. From this perspective, branching restrictions limited the economic opportunities of most individuals with negative repercussions for income equity.

In this paper, we provide the first assessment of whether liberalizing restrictions on intra-state branching affected the distribution of income within states. More specifically, from the mid-1970s through the mid-1990s, most states in the United States removed regulatory restrictions on branching. We test whether removing these restrictions intensified, ameliorated, or had no effect on the skewness of income distribution. While past work shows that liberalizing restrictions on intra-state branching increased the average size of banks (Calem, 1994; Savage, 1993), improved bank efficiency (Jayaratne and Strahan, 1998), and accelerated economic growth (Jayaratne and Strahan, 1996), we examine the impact of bank deregulation on the distribution of income, which has been a central -- if not the central -- front in the battle over many bank regulations.

Methodologically, the deregulation of intra-state branching provides a natural setting for identifying and assessing the impact of regulatory reform on the distribution of income for three reasons. First, a convincing body of research demonstrates that technological and political forces shaped the timing of deregulation, while there is no evidence that shocks to the distribution of income influenced branch deregulation. A second appealing feature of examining branch deregulation is that states deregulated at different times during the estimation period 1977-1994, which allows us to use a cross-state, time-series panel and condition on both state and year fixed effects. Third, we examine the effect of a single policy change, branch deregulation, on different state economies. We therefore reduce identification and comparability problems often associated with the cross-country assessment of policy changes.

Kroszner and Strahan (1999) show that technological, financial, and legal innovations that were largely exogenous to income distribution triggered branch deregulation. First, the courts ruled that automatic teller machines (ATMs) are not bank branches, which weakened the geographical link between customers and banks. Second, checkable money market mutual funds facilitated

banking by mail and telephone, which weakened local bank monopolies. Third, improvements in communications technology lowered the costs of using distant banks. These innovations reduced the monopoly power of local banks, and therefore weakened their ability and desire to fight deregulation. Kroszner and Strahan (1999) further show that cross-state variation in the timing of deregulation reflects the interactions of these shocks with preexisting conditions. Specifically, deregulation occurred later in states where small banks had a bigger market share and hence more political influence; deregulation occurred later in states where powerful insurance companies viewed large, multiple-branch banks as potential competitors; and deregulation occurred earlier in states with a large share of small firms, which is consistent with research showing that small business lending increases after large banks acquire smaller banks (Berger, et al., 1997). Thus, the driving forces behind deregulation and its timing were largely independent of income distribution.

The major finding is that deregulation of branching restrictions reduced the Gini coefficient of income inequality. After conditioning on state and year fixed effects and numerous time-varying state characteristics, we find that deregulation reduced income inequality. While deregulation boosts average per capita income, the results are inconsistent with the view that deregulation boosts average income only by benefiting the rich. Rather, the findings are consistent with the view that deregulation has a disproportionately positive impact on the poor.

We also provide information on which components of the labor force are affected by branch deregulation. Consistent with theory, we find that branching reduces income inequality among the self-employed. The results are consistent with theories that bank competition expands economic opportunities and disproportionately helps those who were cut-off from credit markets before the deregulation. While Black and Strahan (2002) show that deregulation boosts the rate of new

incorporations, we show that deregulation reduces inequality among the self-employed, which captures entrepreneurship during its nascent stages.

Furthermore, the fall in the Gini coefficient on women's wage earnings after deregulation drives the overall results on income distribution. Indeed, the Gini coefficient on men's earnings does not change significantly after deregulation. Since we include year fixed effects, these findings do not reflect trend increases in female labor force participation during this period. Rather, the results are consistent with the view that deregulation enhances the efficiency of credit allocation, which increases the demand for labor, drawing women into the labor force. The findings indicate that deregulation is particularly beneficial to lower income women.

This paper relates to an enormous literature on the determinants and consequences of the distribution of income. Specifically, as reviewed by Demirguc-Kunt and Levine (2007), a substantial body of research examines the degree to which parental wealth and social networks define an individual's economic opportunities and hence perpetuate relative income differences across generations. Market imperfections can prevent resources from flowing to talented, but poor individuals, with adverse effects on economic growth (Banerjee and Newman, 1993; Galor and Zeira, 1993). Researchers focus on income redistribution and public education as mechanisms for expanding economic opportunities, reducing the inefficient propagation of relative incomes, and stimulating economic growth (Aghion, Caroli, and Garcia-Penalosa, 1999; Galor and Moav, 2006). Critically, however, most theories of persistent relative income differences rely on financial market imperfections that prevent the relatively poor from accessing growth-enhancing financial services (Demirguc-Kunt and Levine, 2007). Within these models, easing financial constraints expands the economic horizons of the poor, reduces income inequality, and accelerates economic growth. Thus, it is crucial to assess the income distributional effects of regulatory reform. Using cross-country

regressions, Beck, Demirguc-Kunt and Levine (2007) find that banking sector development reduces income inequality and poverty.¹ In contrast, we analyze the impact of a specific policy change on the distribution of income, rather than examining an overall index of banking sector development. By using the difference-in-differences approach across U.S. states we increase the power of the econometric tests and reduce concerns about omitted variables and endogeneity.

While we examine the impact of relaxing intra-state branching restrictions on the distribution of income across the states of the United States, our work relates to a broad range of financial policy debates. Whether expressed as a genuine belief or as a political strategy, many bank policies recommendations are defended based on income distribution grounds. For example, some advocates of state-owned banks argue that private banks will not lend to the poor. Some arguments in favor of restricting banks from participating in insurance or securities market activities express fears that large financial conglomerates will mobilize capital and allocate to large, connected corporations. Furthermore, many countries restrict bank mergers and acquisition because of concerns regarding large banks. We do not directly assess this wide-range of policies. Rather our findings are consistent with the view that banking reforms that increase bank competition, such as intra-state branch deregulation, reduce the skewness of income distribution. The results suggest that competition in the banking industry disproportionately helps the poor and regulatory impediments to competition retard growth and increase income inequality.

Before continuing, we highlight two analytical limitations with the reported findings that we are in the process of rectifying. First, we do not document how deregulation affects individuals. The CPS data are based on annual representative surveys, but the surveys do not trace individuals through time. The CPS data indicate that the Gini coefficient of income distribution fell after

¹ Das and Mohapatra (2003) analyze the effect of stock market liberalization on incomes of different income quintiles and find that the rich benefit more.

deregulation. Since deregulation boosted average incomes, these results are consistent with the hypothesis that deregulation disproportionately helped the poor and inconsistent with the view that deregulation only helped the rich. But, we do not directly reject the possible (though implausible) scenario that deregulation shifted income from those above the median to those below the median income level while boosting average income. By using the Panel Study of Income Dynamics, we plan to provide more direct evidence on how deregulation influenced individuals in the next version of this paper. Second, this paper argues that deregulation reduces the Gini coefficient on personal and family incomes primarily by reducing the skewness of the income distribution of women. In the next version of this paper, we will provide a formal decomposition of the reduction in the overall Gini coefficient produced by deregulation and also decompose the change in the distribution of women's earnings accounted for by changes in hours worked and that part accounted for changes in wages.

1. Data and Methodology

To assess the effect of branching deregulation on income distribution, we gather data on the timing of deregulation, income distribution across states and over time, and other banking sector and state-level characteristics. This section first presents the data and then describes the econometric methodologies.

1.1. Branch deregulation

Historically, most U.S. states had restrictions on branching within and across state borders. Beginning in the early 1970s, however, many states started relaxing these restrictions, allowing bank holding companies to consolidate subsidiaries into branches and permitting de novo branching

throughout the state. This deregulation led to significant entry into local banking markets (Amel and Liang, 1992), consolidation of smaller banks into large bank holding companies (Calem, 1994) and conversion of existing bank subsidiaries into branches (McLaughlin, 1995). This relaxation, however, came gradually, with the last state lifting restrictions following the 1994 passage of the Riegle-Neal Interstate Banking and Branching Efficiency Act. Following Jayaratne and Strahan (1996), an extensive literature has assessed the impact of this gradual branch deregulation on economic growth, entrepreneurial activity and other banking sector and real economy outcomes. While the intra-state branching deregulation was in many cases accompanied by inter-state branching deregulation, allowing banking holding companies to expand across state borders, the literature has found little effect of inter-state branching deregulation on banking market structure or real outcomes. We therefore focus on intra-state branching deregulation in this paper.

We use the intra-state branching deregulation data as first used by Amel (1993) and Jayaratne and Strahan (1996). Specifically, we use the date when branching via mergers and acquisitions (M&As) was first permitted through the holding company structure. As described by Jayaratne and Strahan, this was typically the first step in the deregulation process, followed by permitting de novo branching. Table A1 presents the deregulation dates. We have data for 50 states and the District of Columbia, but drop Delaware, because of its special banking sector structure.² We also drop South Dakota due to data unavailability of financial and banking data. Delaware and 14 other states deregulated before the start of our sample period in 1977. Arkansas, Iowa and Minnesota were the last states to deregulate, only after the passage of the Riegle-Neal Act in 1994.

² Following a law in 1982 with significant tax incentives, Delaware became a center for the credit card industry.

1.2. Income distribution data

We construct information on the distribution of income from the Current Population Survey (CPS), which is a monthly survey conducted by the Bureau of the Census for the Bureau of Labor Statistics of about 60,000 households across the states of the United States. Specifically, we use data from the March Annual Demographic Supplement of the CPS. It contains information about socio-economic composition of each household and detailed sources of income of each of its members in the previous year. Each household and all its members are assigned a sample weight which corresponds to their representativeness in the population. We use sample weights in all of our analysis.

We measure the distribution of income for each state and year over the period 1977-2003 as the logarithm of the Gini coefficient,³ which is derived from the Lorenz curve. Larger values imply greater income inequality. We start our analysis in 1977 since the 1978 March survey is the first survey in which we can distinguish between households and other institutions. We restrict our analysis to households with at least one member aged 15+ with non-missing income. We drop households with negative total household income. Following the usual practice in analyses of income distribution using the CPS data, we inflate top-coded incomes by a factor of 1.5.⁴

We compute the Gini coefficient for total household income, total personal income, and income from labor. In the case of income from labor, we distinguish between wage and salary income and proprietors' income. In the case of wage and salary income we further distinguish between female and male income earners. We drop all allocated incomes, i.e., incomes that were originally missing but were assigned a non-missing value by the CPS based on demographic

³ Income years 1977-2003 correspond to surveys conducted in 1978-2004.

⁴ For purposes of confidentiality the CPS does not report exact incomes above a certain threshold. Instead, these incomes are grouped into a single category called the "top-code". The top-code changes across years and types of income.

characteristics of the respondents. When analyzing inequality in income from labor we restrict the sample to individuals who belong to the labor force.

We also use CPS data to compute income growth based on data for total household income, total individual income, wage and salary and proprietors' income. Unlike Jayaratne and Strahan (1996), we will focus on the effect of branching deregulation on different components of total household income, namely male and female wage and salary income growth and proprietors' income growth.⁵ Assessing the impact of branching deregulation on income growth using CPS data will also allow us to test the appropriateness of CPS data for such an exercise, as we can compare the results directly with regression results using Department of Commerce data to compute income growth and its components.⁶

Table 1 presents descriptive statistics. The average Gini coefficient across states and over time is 0.42, corresponding to an average of -0.86 for the log of Gini, with a range from 0.33 in New Hampshire in the year 1978 to 0.56 in District of Colombia in the year 1998. The standard deviation of the log of Gini is 0.71, with very similar standard deviations across states (0.49) and within states over years (0.52). Table 1 also shows that the Gini for individual income is on average higher than the household Gini, but shows a smaller standard deviation. The Gini coefficient for wage and salary incomes is of similar magnitudes as the household income Gini, but has a lower standard deviation. Computing separate Gini coefficients for male and female wage and salary earners, however, shows a large standard deviation in the Gini of male wage and salary incomes across states and over time. Finally, the Gini of proprietors' income is on average substantially higher than the average household income Gini and also shows a much higher standard deviation.

⁵ The limited survey sample does not allow us to compute income data for male and female proprietors.

⁶ Jayaratne and Strahan (1996) rely on Department of Commerce data to compute income growth. Since these are aggregate data, they cannot be used to compute Gini coefficients.

1.3. Control variables

We use the U.S. Department of Commerce data to calculate the growth rate of Gross State Product (GSP) and per capita personal income for the years 1977-2003. We use current and lagged growth rates of GSP as time-varying controls for the state of the economy. We also control for government taxes to personal income and government expenditures to personal income in order to account for governmental redistribution policies. These data were obtained from the U.S. Census Bureau. Finally, we control for educational attainment across states and over time by including the ratio of college graduates to total population. In the era of skill-biased technological change, higher ratio of college graduates to total population results in higher income inequality. These ratios were calculated using the March Demographic Supplement described earlier.

1.4. Methodology

We use the differences-in-differences estimation technique to assess the relationship between branch deregulation and income distribution. Specifically, we utilize the following regression set-up:

$$Y_{i,t} = \alpha_i + \beta_t + \gamma D_{i,t} + \delta X_{i,t} + \epsilon_{i,t}, \quad i=1,\dots,49; \quad t=1977,\dots,2003 \quad (1)$$

where Y is a measure of income growth or income distribution, α (β) are a vector of state (time) specific variables, X is a set of time-varying state-level variables and ϵ is the error term. The variable of interest is D , a dummy variable that takes on value one after a state deregulates branching; γ is the coefficient of interest and indicates the impact of branching deregulation on income growth or income distribution. In the case of income distribution – the main focus of this paper - a positive and significant γ suggests that income distribution is increasing after branch deregulation, while a negative and significant γ indicates a reduction in income inequality.

The difference-in difference estimation technique allows us to control for omitted variables. We include time-specific dummy variables to control for economy-wide shocks that might drive income distribution over time, most prominently business cycle effects and long-term trends in income distribution, and state-specific dummy variables to control for time-invariant unobserved state characteristics that might drive income distribution. The coefficient γ therefore measures the effect of branching deregulation relative to the average income distribution over time in state i and relative to average income distribution across all states in year t .

We also use the ratio of assets of insurance companies to the sum of assets of insurance and banking companies across states and over time to assess whether the relationship between income distribution and branching deregulation varies with the degree of economic power of the insurance sector. We thus introduce an additional interaction term into regression (1) of branching deregulation and our measure of relative economic power of the insurance sector. Following Kroszner and Strahan (1999), this interaction should take the opposite sign as the branching deregulation dummy as states with more powerful insurance sector liberalized later and thus benefited less from the deregulation.

When running regression (1), we follow Jayaratne and Strahan and drop the year in which deregulation took place. In total, we have data for 49 states and 27 years, minus 36 state-years in which deregulation took place. This leaves us with 1,287 state-year observations which serve as a base for our analysis. Following recommendations by Bertrand, Duflo, and Mullainathan (2004), we estimate regression (1) allowing for state-level clustering, i.e. allowing for correlations in the error terms over time within states.

2. Results

This section discusses the regression results. We first present income growth regressions to (1) confirm that the CPS data yield results that are consistent with the Commerce data and (2) assess the impact of branching deregulation on different groups of income earners, specifically wage and salary earners and proprietors and dividend, interest and rent earners. Then, we discuss the results on income distribution.

2.1. Branch deregulation and income growth of different income groups

Table 2 gives the coefficient estimates for branching deregulation in regressions of income growth, using both data from the Department of Commerce and the CPS data to compute income growth data. All regressions control for state- and year-fixed effects. As in Jayaratne and Strahan (1996), we thus measure the impact of branching deregulation on income growth relative to state average growth and average growth in a specific year. We find that a regression of income growth in personal income using either Department of Commerce or CPS data on the branching deregulation dummy and state- and year-fixed effects yields a positive and significant coefficient of similar size (row 1). Specifically, using the Department of Commerce data yields a coefficient of 0.54, while using the CPS data yields a coefficient estimate of 0.62 on the branching deregulation dummy. Both estimates are significant at least at the 6% level.

The Table 2 regressions also indicate that different groups have benefited to a different degree from branching deregulation. Specifically, a regression of wage and salary income growth using Department of Commerce data indicates a positive and significant impact of branching deregulation, while a similar regression using CPS data yields a positive but insignificant coefficient on branching deregulation (row 2). Using CPS data to disaggregate wage and salary

income growth into components accounted for by female and male wage and salary earners, however, indicates a positive impact on female wage and salary income growth.⁷ Using Department of Commerce data, we also find a positive impact of branching deregulation on the income of non-farm proprietors, while using both Department of Commerce and CPS data we find a positive impact of branching deregulation on income from dividends, interest and rent.

Summarizing, the Table 2, using the CPS and Department of Commerce data to assess the impact of branching deregulation on income growth and its different components, leads in many cases to quantitatively similar results. In cases where the CPS data lead to very different coefficient estimates, this could be due to a very small sample on certain subgroups, such as farm proprietors. These results suggest that the effect of branching deregulation apply to several groups of income earners – most specifically, female wage and salary earners and earners of rent, interest and dividend. The evidence is less clear for proprietors. While we find a positive effect of deregulation on proprietors' income growth, the result is insignificant probably due to a small sample of proprietors in the CPS.

2.2. Branching deregulation and income distribution

The Table 3 results show a strong negative and significant relationship between branching deregulation and the Gini coefficient. The branching deregulation dummy enters negatively and significantly at least at the 5% level in all five regressions. The column 1 result suggests that relative to the state-specific average and relative to the year-specific average, branching deregulation results in a one percentage point lower Gini coefficient. To gauge the economic effect of this result, we compare the coefficient estimate to the standard deviation of log Gini from state

⁷ The Department of Commerce data do not allow a split-up into female and male wage and salary earners.

and year averages. This standard deviation is 0.034 (Table 1), suggesting that branching deregulation explains 40% of the variation of log Gini relate to state and year averages

The regressions 2 through 5 show the robustness of our findings to controlling for other potential time-varying state-level factors associated with income inequality. The column 2 regression shows that higher tax burden on income is associated with higher income inequality, while higher government spending is associated with lower income inequality. We do not, however, find any significant association of economic growth, as measured by growth in Gross State Product, with income inequality. This does not imply that economic growth is not important in explaining income inequality; rather, it suggests that state-level growth is not associated with deviations of state-level income inequality from the state and year-average Gini coefficient. The column 3 through 5 regression suggest that there might be a negative relationship between lagged GSP growth and income inequality, however, once we control for the lagged Gini coefficient, the coefficient on lagged GSP growth turns insignificant. GSP growth lagged by two years never enters significantly. The share of college graduates in the total population is not significantly associated with deviations of the Gini coefficient from state- and year-average either. Finally, the column 5 regression suggests a strong persistence of the Gini coefficient over time. When controlling for the lag of the Gini coefficient, the size of the coefficient of the branching deregulation dummy drops to -0.08, but continues to enter significantly at the 5% level.

In unreported regressions, we show that the relationship between branching deregulation and income inequality is weaker in states where there was higher political resistance against deregulation from the insurance industry and where deregulation therefore took place later. We interact the branching deregulation dummy with the interaction the size of the insurance sector (total assets in that state and year) relative to the sum of banking plus insurance sector assets. This

interaction term of branching deregulation enters significantly and positively, partly off-setting the negative effect of branching deregulation. This is consistent with findings by Kroszner and Strahan (1999) that states where banks were allowed to distribute insurance products and insurance companies had a larger market share relative to banks deregulated later. Given that technology was undermining the effectiveness of branching restrictions, we expect the effect of branching deregulation therefore to be smaller for states that deregulated later, as part of the positive impact on income equity has most likely already been captured. Comparing the coefficient sizes on the deregulation dummy and its interaction with the relative economic power of insurance companies indicates that at values above one standard deviation of the average ratio of insurance to insurance and banking assets, the relationship between branching deregulation and income distribution turns insignificant.

The Table 4 results show that the empirical association of branching deregulation with lower income inequality comes mostly through lower income inequality of female wage and salary earners and lower income inequality of proprietors. Column 1 repeats the column 3 regression of Table 3, while column 2 shows that the results are confirmed when using total individual rather than total household income to compute the Gini coefficient. Interestingly, GSP growth and its two lags now enter negatively and significantly, suggesting that higher economic growth is associated with lower income inequality when measured on total individual income. Columns 3 through 5 show a strong association of branching deregulation with lower inequality of wage and salary income, but only for female wage and salary earners. Branching deregulation enters negatively and significantly in the regressions of the Gini coefficient of wage and salary income (column 3) and the Gini coefficient of the female wage and salary income (column 4). It does not enter significantly, however, in the regression of the Gini coefficient of the male wage and salary income (column 5). The column 6

regression shows that the negative relationship between branching deregulation and income inequality also holds for proprietor income inequality.

Our results so far suggest that branching deregulation is strongly and negatively associated with income inequality, and this relationship is driven mainly by the inequality of female wage and salary income and the inequality of proprietor income. These results are not only statistically, but also economically significant. Both in the case of female wage and salary earners' income inequality and proprietors' income inequality, branching deregulation lowers the Gini coefficient by almost 50% of the within state, within-year standard deviation.

3. Conclusions

Policymakers and economists disagree about the impact of bank regulations on the distribution of income. In this paper, we test whether liberalizing restrictions on intra-state branching in the states of the United States from the mid-1970s to the mid-1990s intensified, ameliorated, or had no effect on the Gini coefficient of income distribution. Besides boosting average incomes, branch deregulation lowered income inequality. Furthermore, deregulation reduced income inequality among female wage and salary earners and among the self-employed.

REFERENCES

- Aghion, Philippe, Caroli, Eve, and Cecilia Garcia-Penalosa (1999). Inequality and Economic Growth: The Perspective of the New Growth Theories, *Journal of Economic Literature* 37, 1615-1660.
- Amel, Dean and Nellie Liang (1992): The Relationship between Entry into Banking Markets and Changes in Legal Restrictions on Entry. *The Antitrust Bulletin* 37, 631-49.
- Banerjee, A. and A. Newman (1993): Occupational Choice and the Process of Development, *Journal of Political Economy* 101, 274-98.
- Beck, Thorsten; Asli Demirgüç-Kunt, and Ross Levine (2007): Finance, Inequality and the Poor: Cross-Country Evidence. *Journal of Economic Growth*, forthcoming.
- Berger, Alan; Anthony Saunders; Scalise, Joseph and Udell, Gregory (1997): The Effects of Bank Mergers and Acquisitions on Small Business Lending, Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series 1997-28
- Bertrand, Marianne, Esther Duflo and Sendhil Mullainathan (2004): How Much Should We Trust Differences-in-Differences Estimates, *Quarterly Journal of Economics* 119, 249-275.
- Black, Sandra and Philip Strahan (2002): Entrepreneurship and Bank Credit Availability, *Journal of Finance* 57, 2807-2833.
- Calem, Paul (1994): The Impact of Geographic Deregulation on Small Banks, *Business Review*, Federal Research Bank of Philadelphia, 17-31.
- Das, Mitali and Sanket Mohapatra (2003): Income Inequality: The Aftermath of Stock Market Liberalization in Emerging Markets. *Journal of Empirical Finance* 10, 217-48.
- Demirguc-Kunt, Asli and Ross Levine 2007): Finance and Opportunity: Financial Systems and Intergenerational Persistence of Relative Incomes, World Bank mimeo.
- Flannery, Mark (1984): The Social Costs of Unit Banking Restrictions, *Journal of Monetary Economics* 13, 237-49.
- Galor, Oded and J. Zeira. (1993): Income Distribution and Macroeconomics. *Review of Economic Studies* 60, 35-52.
- Galor, Oded and Omer Moav (2004): From Physical to Human Capital Accumulation: Inequality and the Process of Development. *Review of Economic Studies* 71, 1001-26.
- Galor, Oded and Omer Moav. 2006. "Das Human-Kapital: A Theory of the Demise of the Class Structure," *Review of Economics Studies* 73, 85-117.

Greenwood, J. and Jovanovic, B. (1990). "Financial Development, Growth, and the Distribution of Income," *Journal of Political Economy* 98, 1076-1107.

Hammond Bray. 1957. *Bank and Politics in America: From the Revolution to the Civil War*. Princeton University Press.

Jayaratne, Jith and Phil Strahan (1996): The Finance-Growth Nexus: Evidence from Bank Branch Deregulation, *Quarterly Journal of Economics* 111, 639-670.

Jayaratne, Jith and Phil Strahan (1998): Entry Restrictions, Industry Evolution and Dynamic Efficiency: Evidence from Commercial Banking, *Journal of Law and Economics* 41, 239-74..

Kroszner, Randall and Philip Strahan (1999): What Drives Deregulation? Economics and Politics of the Relaxation of Bank Branching Deregulation, *Quarterly Journal of Economics* 114, 1437-67.

McLaughin, Susan (1995): The Impact of Interstate Banking and Branching Reform: Evidence from the States, *Current Issues in Economics and Finance* 1, Federal Reserve Bank of New York.

Savage, Donald T. (1993): Interstate Banking: A Status Report, *Federal Reserve Bulletin* 79, 1075-89.

Southworth, Shirley D. 1928. *Branch Banking in the United States*. New York, NY: McGraw-Hill.

White, Eugene N. (1982): The Political Economy of Banking Regulation, 1864-1933. *Journal of Economic History* 42, 33-40.

Table 1: Descriptive Statistics, 1977-2003

	Mean	Median	St. Dev.	Minimum	Maximum	Standard deviation		
						Cross states	Within states	Within state- years
Log(Gini):								
Total household income	-.864	-.866	.071	-1.123	-.578	.049	.052	.034
Total individual income	-.618	-.616	.053	-.775	-.474	.037	.039	.027
Wage and salary income	-.804	-.802	.050	-.963	-.634	.027	.042	.038
Female	-.840	-.839	.060	-1.058	-.660	.034	.050	.047
Male	-.870	-.867	.079	-1.146	-.605	.041	.068	.050
Proprietors' income	-.324	-.310	.097	-.851	-.100	.053	.082	.067
Gross State Product growth	.023	.024	.039	-.348	.260	.010	.038	.032
Gov. taxes / Personal income	.068	.064	.021	.026	.334	.018	.012	.011
Gov. expenditure / Personal income	.140	.131	.049	.068	.457	.046	.016	.012
Proportion of college grads.	.386	.387	.093	.153	.608	.053	.077	.019
Insurance / Banking	.443	.436	.099	.165	.856	.081	.059	.051

Note: This table is based on 1,287 state-year observations, for the years 1977-2003 and 49 states. We drop state-years in which deregulation took place.

Table 2: The Effect of Deregulation on Growth of Per Capita Income by Source of Data

	Commerce	CPS
Personal income	.54 (.27)**	.62 (.34)*
Wage and salary income	.73 (.36)**	.57 (.39)
Female	...	1.18 (.53)**
Male28 (.43)
Supplements to wages and salaries	.61 (.33)*	...
Proprietor's income	-4.80 (5.95)	5.75 (4.49)
Farm proprietors' income	-70.46 (70.75)	-384 (33010)
Non-farm proprietors' income	1.35 (0.56)**	6.05 (4.36)
Income from dividends, interest, and rent	.63 (.28)**	1.76 (.89)*
Num. obs	1,213	1,213

Notes: The table reports estimated coefficients from separate regressions of the indicated variables on deregulation indicator and state- and year fixed effects, for the years 1977-2001. Standard errors in parentheses are adjusted for state-level clustering. Coefficients are multiplied by 100. A "*" indicates 10% significance; "***" - 5% significance; and "****" - 1% significance.

Table 3: The Effect of Branching Deregulation on Income Inequality

	(1)	(2)	(3)	(4)	(5)
Deregulation indicator	-.013 (.006)**	-.013 (.005)***	-.013 (.005)***	-.012 (.005)**	-.008 (.004)**
GSP growth		-.056 (.045)	-.042 (.040)	-.043 (.040)	-.055 (.036)
Gov. taxes / Personal income		.511 (.067)***	.587 (.074)***	.594 (.073)***	.386 (.058)***
Gov. expenditure / Personal income		-.271 (.086)***	-.321 (.097)***	-.311 (.098)***	-.257 (.078)***
GSP growth 1-year lag			-.060 (.029)**	-.058 (.029)**	-.033 (.025)
GSP growth 2-year lag			-.030 (.035)	-.029 (.036)	-.018 (.039)
College grads.				-.085 (.062)	-.036 (.053)
Log(Gini) 1-year lag					.333 (.037)***
R-squared	.79	.79	.79	.79	.81
Num. obs	1,287	1,287	1,287	1,287	1,239

Note: Standard errors in parentheses are adjusted for state-level clustering. The sample is at the state-year level, for the years 1977-2003, except the last column in which the sample is constrained to 1978-2003. The dependent variable is Log(Gini), which is based on total household income. All models control for state- and year fixed effects. The calculation of the Gini index is based on individuals who are at least 15 years of age (14+ prior to 1980) and live in a household. A "*" indicates 10% significance; "***" - 5% significance; and "****" - 1% significance.

Table 4: The Effect of Deregulation on Inequality by Type of Income

	Total household income	Total individual income	Wage and salary income			Proprietor income
			All	Female	Male	
Deregulation indicator	-.013 (.005)***	-.013 (.006)**	-.015 (.006)**	-.023 (.008)***	-.007 (.008)	-.032 (.016)**
GSP growth	-.042 (.040)	-.095 (.029)***	-.096 (.036)**	-.052 (.046)	-.132 (.047)***	-.188 (.062)***
Gov. taxes / Personal income	.587 (.074)***	.496 (.071)***	.656 (.108)***	.657 (.128)***	.769 (.134)***	.210 (.180)
Gov. expenditure / Personal income	-.321 (.097)***	-.377 (.097)***	-.352 (.159)**	-.157 (.173)	-.381 (.171)**	-.140 (.185)
GSP growth 1-year lag	-.060 (.029)**	-.086 (.019)***	-.115 (.030)***	-.151 (.051)***	-.113 (.030)***	-.065 (.056)
GSP growth 2-year lag	-.030 (.035)	-.057 (.024)**	-.154 (.035)***	-.134 (.059)**	-.214 (.040)***	.108 (.053)**
R-squared	.79	.75	.47	.43	.63	.54
Num. obs	1,287	1,287	1,287	1,287	1,287	1,287

Note: Standard errors in parentheses are adjusted for state-level clustering. The sample is at the state-year level, for the years 1977-2003. The dependent variable is Log(Gini), which is based on the relevant type of income. All models control for state- and year fixed effects. The calculation of the Gini index for the total household- and total individual-income is based on individuals who are at least 15 years of age (14+ prior to 1980) and leave in a household. The calculation of the Gini index for wage and salary workers is additionally restricted to individuals who report themselves as wage and salary workers and belong to the labor force. Similarly, the calculation of the Gini index for proprietors is restricted to individuals who report themselves as self-employed and belong to the labor force. Allocated incomes are dropped. All income variables are corrected for top-coding as follows: (1) we drop incomes above a year-specific top-code and (2) we inflate top-coded incomes by 1.5. A "*" indicates 10% significance; "***" - 5% significance; and "****" - 1% significance.

Table A1: Branching Deregulation Events

State	State code	Year of deregulation
Alabama	AL	1981
Alaska	AK	1960
Arizona	AZ	1960
Arkansas	AR	1994
California	CA	1960
Colorado	CO	1991
Connecticut	CT	1980
District of Columbia	DC	1960
Florida	FL	1988
Georgia	GA	1983
Hawaii	HI	1986
Idaho	ID	1960
Illinois	IL	1988
Indiana	IN	1989
Iowa	IA	1999
Kansas	KS	1987
Kentucky	KY	1990
Louisiana	LA	1988
Maine	ME	1975
Maryland	MD	1960
Massachusetts	MA	1984
Michigan	MI	1987
Minnesota	MN	1993
Mississippi	MS	1986
Missouri	MO	1990
Montana	MT	1990
Nebraska	NE	1985
Nevada	NV	1960
New Hampshire	NH	1987
New Jersey	NJ	1977
New Mexico	NM	1991
New York	NY	1976
North Carolina	NC	1960
North Dakota	ND	1987
Ohio	OH	1979
Oklahoma	OK	1988
Oregon	OR	1985
Pennsylvania	PA	1982
Rhode Island	RI	1960
South Carolina	SC	1960
Tennessee	TN	1985
Texas	TX	1988
Utah	UT	1981
Vermont	VT	1970
Virginia	VA	1978
Washington	WA	1985
West Virginia	WV	1987
Wisconsin	WI	1990
Wyoming	WY	1988