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ABSTRACT

In light of the human suffering and economic costs associated with mental illness, we provide the first assessment of whether local credit conditions shape the incidence of mental depression. Using several empirical strategies, we discover that bank regulatory reforms that improved local credit conditions reduced mental depression among low-income households and the impact was largest in counties dominated by bank-dependent firms. On the mechanisms, we find that the regulatory reforms boosted employment, income, and mental health among low-income individuals in bank-dependent counties, but the regulatory reforms did not increase borrowing by these individuals.

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1. Introduction

Almost one in five U.S. adults experienced mental illness in 2016 and over three million became recipients of Social Security and Disability Insurance benefits due to a mental health condition. Insel (2008) estimates that mental illness lowers U.S. earnings by $193 billion per annum due to absenteeism, presenteeism, and lower productivity. Looking globally, the World Health Organization (2011) reports that mental illness is the leading cause of lost working hours and estimates that the global cost of mental illness in 2010 was nearly $2.5 trillion.[1]

In light of the human suffering and economic costs from mental illness, we provide the first assessment of the impact of local credit conditions on mental health. Two lines of research guide our study. First, extensive research shows that credit conditions shape economic welfare by influencing economic growth (King and Levine 1993; Jayaratne and Strahan 1996; Levine and Zervos 1998; Rajan and Zingales 1998), income inequality (Beck, Levine, and Levkov 2010), entrepreneurship (Black and Strahan 2002; Kerr and Nanda 2009; Levine and Rubinstein 2017, 2018), household consumption and borrowing (Agarwal and Qian 2014; Agarwal et al 2018), and access to education and homes (Sun and Yannelis 2016; Favara and Imbs 2015). Second, research highlights the connections between economic welfare and mental health, as low-incomes, underemployment, and economic duress are positively associated with mental depression (e.g., Lund et al 2010 2011; Reeves et al 2012; Apouey and Clark 2015; Wickham et al 2017; Persson and Rossin-Slater 2018; Adhvaryu, Fenske, and Nyshadham 2019). These two lines of research, therefore, offer the following hypotheses: (1) improvements in credit conditions will reduce mental illness and (2) these effects are likely to be largest among lower-income workers because (a) improvements in credit conditions tend to disproportionately boost the earnings of lower-income individuals (Beck, Levkov, and Levine 2010) and (b) mental illness is more prevalent among lower-income individuals. There are, however, potentially countervailing influences. For example, Kerr and Nanda (2009) find that improvements in credit conditions increase the rates of business entry and exit. While this spurs economic dynamism, it might also increase anxiety about job stability and harm mental health.

To evaluate the impact of credit market conditions on mental health and shed empirical light on the mechanisms linking finance and mental health, we exploit an exogenous source of

[1] On U.S. Social Security and Disability Insurance, see https://www.nimh.nih.gov/health/statistics/mental-illness.shtml and the Annual Statistical Report on the Social Security Disability Insurance Program, 2016. For information on the costs of mental illness, see Bartel and Taubman (1986), Kessler (2012), World Health Organization (2015, 2018), and Chisholm et al (2016).

variation in local credit conditions: the deregulation of interstate bank branching that began in 1995 and continued through 2005 (e.g., Johnson and Rice 2008). Although the Riegle-Neal Act eliminated regulatory prohibitions on interstate banking in 1995, it did not prohibit states from erecting barriers to out-of-state branch expansion. Since the costs of branching are lower than the costs of establishing subsidiaries, interstate branching restrictions limited competition between banks in different states and made banking markets less efficient. Rice and Strahan (2010) show that lowering regulatory barriers to interstate branching improved credit conditions by reducing the interest rates charged by banks on loans to small firms. Building on their strategy, we use cross-state, cross-time variation in the removal of regulatory impediments to interstate bank branching as an exogenous source of variation in local credit conditions and examine the impact of these regulatory reforms on mental health.

We explore the impact of these bank regulatory reforms on mental illness using data from the National Longitudinal Survey of Youth 1979 (NLSY79). The NLSY79 is a nationally representative survey that follows individuals born in the years 1957-1964. There are 12,686 individuals, who were between the ages of 14 and 22 when the survey started in 1979, and the NLSY79 continues to survey these individuals. In addition to information on employment, income, education, wealth, demographics, cognitive and noncognitive traits, and family background, the NLSY79 also obtains information on each individual's physical and mental health. For mental health, the NLSY79 asks seven questions that comprise the Center for Epidemiological Studies (CES) depression index. We examine (a) the answers to each of the seven questions separately, (b) the composite depression index based on equally weighting the answers to the seven questions, and (b) several other measures of depression based on different weighting schemes. We focus our discussion on the results using the composite, equally weighted depression index. Since the NLSY79 provides these mental health measures over time for each individual, we test whether changes in credit conditions trigger changes in the mental health of individuals.

We use three empirical strategies to assess the impact of interstate branch deregulation on mental health. First, exploiting the cross-state, cross-time variation in bank deregulation and the longitudinal nature of the NLSY79, we examine the response of individual mental health to branch deregulation while conditioning on individual fixed effects, gender-race-year fixed effects, state-specific linear time trends, and time-varying state characteristics, such real gross

state product (GSP) per capita and population. Furthermore, we also differentiate between high- and low-income individuals. As noted above, bank deregulation exerts an especially large impact on the earning of lower income individuals, so we test whether the relationship between branch deregulation and mental health is more pronounced among lower-income individuals. By controlling for individual and gender-race-year effects, we condition out time-invariant individual-level characteristics that shape mental health and time-varying factors that differentially affect these sub-population groups.

The second empirical strategy differentiates among counties within states and uses a spatial regression discontinuity research design to compare neighboring counties that are subject to different interstate branching policies. Huang (2008) compared counties across state borders when assessing the impact of interstate banking deregulation that allowed banks to establish subsidiaries in another state. We apply this method to interstate branch deregulation that allowed banks to establish branches in other states. Thus, we compare two otherwise similar counties separated by a state border in which the states have different interstate branching regulations and evaluate the impact of changes in these branching regulations on changes in mental health in the counties. If the results from this spatial regression discontinuity strategy confirm the earlier findings, this will reduce concerns that omitted variables drive the findings on the relationship between finance and mental health.

Our third empirical strategy also differentiates among counties within states and explores two potential mechanisms through which credit conditions shape mental health: The “firm credit” and “consumer credit” mechanism. The firm credit mechanism holds that enhancing credit conditions will improve mental health by boosting income and employment. We evaluate this potential mechanism in two ways. First, we differentiate counties by the degree to which the county’s firms depend on external finance, namely banks. If easing credit constraints improve mental health by boosting income and employment, then we should find a particularly large impact of deregulation on mental health in counties where bank branch deregulation is likely to have the biggest effect on firm credit conditions: counties with firms that depend heavily on banks. Following Rajan and Zingales (1998), we differentiate counties by the degree to which firms are financially dependent and examine whether interstate branch deregulation exerts an especially pronounced effect on mental health among low-income workers and in counties dominated by financially-dependent firms. Second, we differentiate counties by the density of

bank branches before bank branch deregulation. Holding other features of the counties constant, we expect that bank branch deregulation will have a bigger effect firms' access to credit in "under-banked" counties than in counties that were already densely banked before deregulation. The second mechanism—the consumer credit mechanism—holds that enhancing credit conditions will improve mental health by easing household access to credit, without necessarily increasing income or employment. To assess this consumer credit, we test whether interstate bank branch deregulation triggered an increase in borrowing among lower-income workers.

We discover that (1) interstate branch deregulation is associated with a material drop in mental depression, (2) this effect is driven by improvements in mental health among low-income individuals, and (3) these results hold when implementing the spatial regression discontinuity strategy. These findings are robust to including individual and gender-race-year fixed effects, state-specific linear time trends, and time-varying state characteristics. The estimated impact is large. If the average U.S. state relaxes interstate branching restrictions by one degree—where branch restrictions range from zero (most restrictive) to four (least restrictive), the estimates indicate that the composite depression index (*Depression Index*) for the low-income group drops by 0.522, which represents a 15% drop relative to the sample mean, and clinical depression falls by 3.8%.

Turning next to the mechanisms through which credit conditions shape mental health, we first find that interstate branch deregulation triggers an especially pronounced *increase* in income and employment and *decrease* in mental depression (a) among low-income workers within counties dominated by bank-dependent firms and (b) among low-income workers within counties with low pre-deregulation bank density. Thus, following branch deregulation, the same group of individuals experienced both a disproportionately large increase in employment and income and especially large decrease in mental depression. These findings are consistent with the firm-credit channel: easing firm credit constraints boosts income and employment and these improvements enhance mental health. By focusing on a group of individuals most likely to be affected by interstate branch deregulation—low-income workers in bank-dependent counties, we reduce concerns that omitted variables confound our findings. Second, we do not find evidence consistent with the consumer-credit channel. In particular, we find no evidence that interstate branch deregulation increases borrowing by individuals, with beneficial effects on mental depression.

The remainder of the paper proceeds as follows. Section 2 discusses the Riegle-Neal Act and the details of interstate branch deregulation, while Section 3 presents the data and variable definitions. Section 4 presents the baseline result and spatial regression discontinuity design. Section 5 explores potential channels and deepens understanding of factors influencing mental health condition and subjective well-being. Section 6 concludes.

2. Bank Branch Deregulation

The Riegle-Neal Interstate Banking and Branching Act (IBBEA) of 1994 effectively removed restrictions on banks expanding across state lines through the establishment of separately capitalized bank subsidiaries and removed federal barriers to interstate branching. As explained by Johnson and Rice (2008), however, the Act provided states with the discretion to limit bank expansion across state lines through the establishment of bank branches. Interstate branching can occur through two means: (a) an out-of-state bank can acquire an in-state bank and convert that bank into its branches or (b) an out-of-state bank can either establish new branches within a state ("de novo" branching) or purchase the branches of an in-state bank.

Following Riegle-Neal, many states erected barriers to banks from other states establishing branches within their borders. States used four types of regulatory restrictions on interstate branching. First, some states imposed minimum age restrictions with respect to how long a target bank has been in existence before it can be acquired and consolidated into branches. These minimum age restrictions, which have a federally set maximum of five years, make cross-state banking more costly because they required that banks (a) purchase an entire older bank, which is more costly than opening a branch, or (b) open a new subsidiary and then wait until the minimum age restriction has been satisfied before converting the subsidiary into a branch. Second, some states prohibited de novo interstate branching. Third, some states prohibited the acquisition of a single branch or portions of an institution, which represents an additional barrier to cross-state branching. Fourth, some states imposed limits on the percentage of insured deposits in state that a single bank could hold, which could limit large interstate bank mergers.

Building on Johnson and Rice (2008), Rice and Strahan (2010) construct an index of regulatory restrictions on interstate branching. Based on their data, our *IBBEA Index* takes a value between zero and four, where we add one point to the index if the state (1) does not impose a minimum age restriction for acquisition, (2) allows de novo interstate branching, (3) permits

interstate branching by acquiring a single branch; (4) sets the deposit-cap no less than 30%. Thus, larger values indicate a more deregulated interstate branching environment. We use this index to exploit post-1994, cross-state variations in restrictions on interstate branching.

3. Data and Variables

3.1 Individual-Level Data

We extract data from the National Longitudinal Surveys Youth 1979 (NLSY79) administered by the U.S. Bureau of Labor Statistics. The NLSY79 is a nationally representative survey that follows a sample of American youth born in the years 1957-1964. A total of 12,686 individuals (aged 14 -22 years) were interviewed in the initial survey year, 1979. The surveys were conducted annually from 1979 to 1994, and then biannually afterwards. Following Altonji and Pierret (2001) and Levine and Rubinstein (2017), we restrict the NLSY79 sample as follows. We drop individual-year observations with a missing state identifier and those not residing in one of the 50 states or the District of Columbia. We also drop observations with missing data on key variables and those who change their residence state over the sample period. We use the sample weights provided by NLSY79.

The NLSY79 has two advantages over several other individual-based U.S. datasets. First, it is a representative, longitudinal survey. The long-panel nature of the NLSY79 allows us to control for individual fixed effects to better identify the impact of interstate branch deregulation on mental health. Second, in addition to containing information on standard demographic and economic traits, the NLSY79 also contains information on family background, physical and mental health, and an assortment of other cognitive and noncognitive traits.

In our analyses, we control for several time-varying, state-specific traits that are not part of the NLSY79 data. Gross State Product (GSP) per capita and total population come from the Bureau of Economic Analysis. We adjust all nominal values into 2010 prices using CPI prices.

3.2 Key Variables

3.2.1 Depression Measures

We use measures of each respondent's level of depression based on questions in the Attitudes, Health, and Health Module 40 & Over sections of the NLSY79. The NLSY79 surveys each individual's mental health in 1992, 1994, and the year immediately after the person becomes 40 years old. Thus, we have three measures of each individual's mental health. For most of the interviewees, therefore, we have two depression measures before the 1994 Riegle-Neal Act and one measure afterwards. Given data on mental health and the index of restrictions on interstate bank branching, our sample period runs from 1992 through 2005.

We utilize the Center for Epidemiologic Studies Depression Scale, which measures symptoms of depression using seven sets of questions. Respondents were asked to evaluate their degree of agreement (during the past week) with the following statements:

(1) I did not feel like eating; my appetite was poor (*Trouble Eating*),

(2) I had trouble keeping my mind on what I was doing (*Trouble Concentrating*),

(3) I feel depressed (*Feel Depressed*),

(4) I felt that everything I did was an effort (*Everything an Effort*),

(5) My sleep was restless (*Trouble sleeping*),

(6) I felt sad (*Feel Sad*), and

(7) I could not get "going" (*Lethargic*).

For each statement, respondents were asked to choose from (a) Rarely/None of the time/1 Day, (b) Some/A little of the time/1-2 Days, (c) Occasionally/Moderate amount of the time/3-4 Days, and (d) Most/All of the times/5-7 Days. Corresponding ordinal values of 0 to 3 points are assigned to these four responses.

Besides ratings on the seven individual items, NLSY79 also reports a total score (*Depression Index*) that aggregates the individual responses to a single number spanning from 0 (individual chooses 0 as an answer for all seven questions, least depressed) to 21 (individual chooses 3 for all dimensions, most depressed). This *Depression Index* is often employed in epidemiological and treatment studies to screen for depression disorder in the community, and a cutoff value of 8 is widely used to detect clinical depression (Levine, 2013).

To measure whether an individual passes a particular threshold measure of "clinical depression," we create dummy variables based on the *Depression Index*. Specifically, if the

Depression Index is above 8, then *D-Depression Index Above 8* equals one and equals zero otherwise; if the *Depression Index* is above 10, then *D-Depression Index Above 10* equals one and equals zero otherwise; and if the *Depression Index* is above 12, then *D-Depression Index Above 12* equals one and equals zero otherwise. Thus, in addition to the *Depression Index*, we examine these three indicators of severe depression.

As an additional robustness test, we create and examine measures based on the intensity of the answers to the seven questions regarding mental depression. In particular, *% of Answers "0"* equals the percentage of the seven questions that the respondent answers, "Rarely/None of the time/1 Day per week;" *% of Answers "1"* equals the percentage of the seven questions that the respondent answers, "Some/A little of the time/1-2 Days per week;" and *% of Answers "2"* and *% of Answers "3"* are defined analogously.

3.2.2 Individual-Level Characteristics

Inspired by a growing literature on the "economics of happiness" and subjective well-being (Dolan, Peasgood and White, 2008), we examine several individual-level characteristics. With respect to basic traits, we examine *Education* and *Age*, which equal the highest grade completed by the respondent, ranging from below high school (less than 12 years of schooling) to advanced graduate (over 16 years of schooling), and the age of the difference between the birth year and the survey year respectively. With respect to family background, we examine the following. *FamilyIncome7981* equals the natural logarithm of one plus the average total family income over the 1979 to 1981 period (in 2010 dollars). *MotherEducation* and *FatherEducation* equals the maximum years of schooling received by the respondent's mother and father respectively. *D-BothParents* is a dummy variable that equals one if the respondent lived with both parents at the age 14, and zero otherwise.

To capture an individual's aptitudes, attitudes, and personality traits, we examine the following. *AFQTAbilityTest* equals the respondent's percentile score from taking the Armed Services Vocational Aptitude Battery (ASVAB) test in 1980, where the test is designed to measure knowledge and skill in the areas of arithmetic reasoning, word knowledge, paragraph comprehension and numerical operations. *RosenbergSelfEsteem* equals the individual's score using the Rosenberg Self-Esteem Scale, which is computed from respondent's answers in 1987

to questions designed to measure self-worth (Rosenberg, 1979).[2] *PearlinSenseOfControl* equals the Pearlin Mastery score based on questions from the 1992 survey and is based on answers to seven questions designed to measure the respondent's sense of control over one's life (Pearlin et al 1981).[3] *D-RiskAttitude* is a dummy variable that equals one if the respondent answers "Yes" facing the question "Would you take a job that could either double family income or cut income by a third" in the 1993 survey year, and zero otherwise. This dummy variable proxies for the respondent's level of risk tolerance just before 1994 IBBEA deregulation.

3.2.3 Variables for the Channel Explorations

We also examine the impact of interstate bank branch deregulation on each individual's economic conditions. *D-WorkHours* is a dummy variable that equals one if the respondent participates in the job market and has positive working hours in a given year, and zero otherwise. *Log(WorkHours)* takes the natural logarithm of one plus total working hours. *Log(EmpWeeks)* takes the natural logarithm of one plus total employment weeks. *Log(TotalIncome)* is the natural logarithm of one plus the respondent's total income (in 2010 dollars) including wages, salaries, and income from farm or business.

Finally, we examine the degree to which individuals borrow. *Leverage* equals the ratio of total liabilities (excluding mortgages on residential property, such as debts on farm/business/other property, debts on vehicles etc.) to total assets (excluding the market value of residential property, such as the market value of the farm/business/other property, vehicles, etc.). *D/I Ratio* is the ratio of total liabilities excluding mortgages on residential property as defined above over respondent's total income (including wages, salaries, and income from farm or business).

3.2.4 State-Level Controls

We also control for the following time-varying, state-specific influences. *Log(GSP Per Capita)* and *Log (Population)* are the natural logarithm of Gross State Product (GSP) per capita and total state population respectively and are obtained from the Bureau of Economic Analysis.

[2] Respondents were asked to choose (1) Strongly Agree, (2) Agree, (3) Disagree, and (4) Strongly Disagree over ten statements, such as "I am a person of worth," "I have a number of good qualities" etc. The total score ranges from 0 to 30, with a higher value indicating a higher level of self-esteem.

[3] Respondents were asked to choose (1) Strongly Disagree, (2) Disagree, (3) Agree, and (4) Strongly Agree over seven statements, such as "I have little control over the things that happen to me," "There is little I can do to change many of the important things in my life" etc. The total score ranges from 7 to 28, with a higher value indicating a more positive self-concept and a stronger internal control over one's destiny.

3.3 Summary statistics

Table 1 provides summary statistics on key variables using the sampling weights provided by the NLSY79 over our sample period 1992-2005, and Appendix 1 provides detailed variable definitions.[4] The *Depression Index* ranges from 0 (not depressed at all) to 21 (most depressed), and the sample average is 3.5. 13.6% of respondents suffer from clinical depression as measured by a *Depression Index* score that is above eight.

Figure 1 graphs the average value of the *Depression Index* from 1992 through 2014. As shown, depression falls during the period of rapid economic growth in the 1990s, but rises sharply following the 2008 global financial crisis. In our analyses, we will focus on individual-level data and will condition out such trends, but the aggregate movements are consistent with past work showing the positive association between economic conditions and mental health.

4. Empirical Results

In this section, we first exploit the cross-state, cross-time variation in bank deregulation and the longitudinal nature of the NLSY79 to examine the relationship between branch deregulation and mental health while differentiating between high- and low-income individuals and conditioning on individual, state, and gender-race-year fixed effects as well as time-varying state economic conditions. We also show that the results are robust to several sensitivity analyses, including the inclusion of state specific linear time trends. We then exploit the county-level data and employ a spatial regression discontinuity research design to compare neighboring counties that are subject to different interstate branching policies.

4.1 Baseline Results

We use a generalized *difference-in-difference* estimation strategy that exploits the staggered lowering of regulatory impediments to interstate state branching to evaluate the impact of bank regulatory reforms on mental depression. Thus, our analyses employ the following panel regression model:

$$Y_{i,s,t} = \alpha + \beta \cdot IBBEA\ Index_{s,t} + \theta \cdot Controls_{i,s,t-1} + \delta_i + \delta_{g,r,t} + \varepsilon_{i,s,t}, \quad (1)$$

[4] All continuous variables are winsorized at the 1st and 99th percentiles.

where $Y_{i,s,t}$ measures the mental health of individual *i* from state *s* at time *t*. $IBBEA\ Index_{s,t}$ is the interstate bank branching deregulation index of state *s* at time *t*. $IBBEA\ Index_{s,t}$ ranges from zero to four, where higher values indicate fewer restrictions on interstate branch banking. β is our key coefficient of interest, capturing the impact of bank branch deregulation on mental health. $Controls_{i,s,t-1}$ is a matrix of (a) time-varying state-level characteristics, including the log of GSP per capita and the log of total population and (b) time-invariant individual-level traits, including the income of the individual's family when the individual was young, the education level of each parent, whether the individual was raised in a home with both parents, the individual's AFQT, Rosenberg, Pearlin Mastery, and Risk Aversion scores. In some specifications we include individual fixed effects, δ_i, instead of these individual-level traits. $\delta_{g,r,t}$ denotes gender-race-year fixed effect. All regressions use the survey weights provided by NLSY79 to adjust for non-response, clustering, and stratification issues inherent in the survey data. Standard errors are clustered at the state level.

Table 2 presents the results from estimating equation (1) while using various combinations of controls and using different subsamples of individuals. Columns (1) to (3) report results with state and gender-race-year fixed effects and an extensive list of time-invariant individual traits. Columns (4) to (6) include individual fixed effects. By including individual and gender-race-year effects, we condition out time-invariant individual-level characteristics that might shape mental health and time-varying factors that differentially affect these sub-population groups. Following Chetty, Hendren, Kline and Saez (2014), we differentiate between the low- and high-income subsamples by (1) computing average total income (in 2010 dollars), including wages, salaries and income from farm or business, over the three-year window immediately before our sample period, (i.e., 1989-1991) and (2) dividing each state's sample of individuals into low- and high income subsamples based on the state median value of average total income over the 1989-1991 period.

As shown in columns (1) – (3), we discover that bank branch deregulation is associated with a sharp drop in depression among lower income individuals, but not among the high-income group. The estimated coefficient on *IBBEA Index* is both economically large and statistically significant among the sample of low-income individuals. The point estimate for the low-income group is -0.284, which implies that one more degree of interstate bank branch openness, i.e., an increase of the *IBBEA Index* of one, is associated with an 8% reduction in the *Depression Index*

relative to the sample mean (0.08=0.284/3.508). In contrast, the point estimate for the high-income group is -0.053 and statistically insignificant. The difference between the estimates for the low- and high-income groups is statistically significant as measured by the Wald test. The remaining coefficients in column (1) to (3) are consistent with existing research on the "economics of happiness." For example, individuals from higher-income families (*FamilyIncome7981*) and those who were raised in two-parent households (*D-BothParents*) tend to suffer from less mental depression. We also find that individuals with higher learning aptitude scores, greater self-esteem, and a stronger sense of internal control over one's life also have lower depression scores.

When also conditioning on individual fixed effects, we continue to find that lowering regulatory barriers to interstate bank branching is associated with a material improvement in mental health among low-income individuals, but not among high-income individuals. As shown in columns (4) - (6) of Table 2, lower regulatory barriers to interstate bank branching is associated with a material improvement in mental health among low-income individuals. For example, the coefficient in column (5) suggests that one more degree of interstate bank branch openness—as measured by the *IBBEA Index* that ranges from 0 to 4—reduces the *Depression Index* by almost 0.297, which represents a 8.5% decline relative to the sample mean.

4.2 Baseline Results: Robustness Tests

We next focus on severe depression by examining *D-Depression Index Above 8*, *D-Depression Index Above 10*, and *D-Depression Index Above 12*. These dummy variables indicate whether the individual has a *Depression Index* value above 8, 10, and 12 respectively, where the cut-off value of 8 is often used to gauge clinical depression. We use these as the dependent variables in columns (1) to (3) of Table 3. Furthermore, as an additional robustness test, we examine the intensity of the answers to the seven questions regarding mental depression using the four variables defined above: *% of Answers "0," % of Answers "1," % of Answers "2,"* and *% of Answers "3."* Table 3 also provides the results on these four mental depression indicators.

As shown in Table 3, the results on severe depression are fully consistent with the earlier results using the *Depression Index*: reducing regulatory restrictions on interstate branching is associated with a material drop in the incidence of severe depression among low-income individuals, but not among high-income individuals. For example, among the low income group,

the estimated coefficients indicate that one more degree of interstate branch deregulation (as measured by the *IBBEA Index*) is associated with a drop in the probability of severe mental depression of between 1.4% and 1.8% depending on which cutoff is employed (e.g., *D-Depression Index Above 8*, *D-Depression Index Above 10*, or *D-Depression Index Above 12*. The results in Table 3 also emphasize the negative impact of bank deregulation on depression among low income individuals when using the alternative indicators of depression that focus on intensity of the answers to the seven questions used to gauge depression (columns 4 to 7). Following a reduction in the restrictions on interstate branch deregulation (an increase in *IBBEA Index*), individuals are much more likely to answer that they rarely or never experience the seven features of depression and are much less likely to answer that they experience the seven features of depression 5-7 days per week.

We also examine the relationship between interstate branch regulatory reforms and responses to each of the seven questions underlying the composite *Depression Index*. As reported in Table 4, we find that regulatory reforms that improve the operation of banking systems improve the mental well-being of low-income individuals with respect to *Trouble Concentrating*, *Feel Depressed*, *Everything an Effort*, *Trouble sleeping*, and *Feel Sad*. This examination of the seven core aspects of depression largely confirms the earlier findings that bank regulatory reforms that improve credit conditions tend to reduce mental distress among low-income individuals.

Furthermore, we show that the results are robust to including state-specific linear time trends. Although the analyses above include individual (and hence state) fixed effects, there might be trends in state conditions that account for the reduction in depression following the relaxation of interstate branching restrictions. When we control for state-specific linear time trends, all of the results hold—as reported in Table 5. The point estimates are even larger. For the *Depression Index*, the coefficient in column (1) suggests that one more degree of interstate bank branch openness reduces the *Depression Index* by 0.522, a 15% drop relative to the sample mean. When examining severe depression among the low-income group (*D-Depression Index Above 8*), the estimated coefficient in column (2) indicates that one more degree of interstate branch deregulation is associated with a drop in the probability of severe mental depression of about 3.8%. In the remainder of the analyses, we include state-specific linear time trends but all of the results hold if these trends are excluded.

4.3 Spatial Regression Discontinuity Design

We next employ a spatial regression discontinuity design to address concerns that omitted variables bias the results. As argued by Huang (2008), geographically proximate counties across a shared state border are likely to be similar in both observable variables (e.g., economic growth) and unobservable—and hence omitted—variables. As a result, adjacent counties with different bank branch regulations can be a good "match" with respect to observables and unobservables and therefore provide an additional empirical strategy for assessing the impact of changes in credit conditions on mental health. Employing this strategy, we compare changes in mental health in adjacent counties across state borders with different and changing branching regulations.

To implement the empirical design, we obtain 1990 state- and county-boundary data from the U.S. Census and create contiguous county-pairs across state borders.[5] We then map this county-pair data into our NLSY79 sample and re-perform the main tests above. We restrict the sample to contiguous county-pairs in these analyses. We control for county-pair and gender-race-year fixed effects, as well as state-specific linear time trends, in all regressions and cluster the standard errors at the county-pair level.

As shown in Table 6, the results from spatial regression discontinuity analyses confirm the analyses above: interstate branch deregulation is associated with a sharp reduction in mental illness among low-income individuals, but not among high-income individuals. Among the low-income group distributed in contiguous counties along the state border, an increase in bank branch deregulation is associated with a reduction in mental depression.[6]

[5] https://www.census.gov/geo/maps-data/data/tiger-cart-boundary.html

[6] One potential concern with these analyses is that because cross-state lending is not restricted, residents close to the borders with other states may turn to those banking markets for credit. In this case, the bank regulations of the state in which an individual is a resident might not matter much. Since people tend to borrow from geographically close banks, we examine whether the reported results hold when eliminating county-pairs across state borders that are "too close." To define "too close," we first note that Petersen and Rajan (2002) find (in their Table I, Panel A) that the median distance between a firm and its lender is nine miles. Starting with this definition of "too close," we first measure the travel distance between the geographic centers of two contiguous counties and then drop county-pairs in which the distance is less than nine miles. We try different cutoffs (see Table OA3) and confirm that the results presented in Table 6 hold across different cutoff levels of closeness.

5. Evidence on the Channels between Bank Branch Deregulation and Depression

In this section, we use additional empirical strategies to provide evidence on the channels connecting interstate bank branch deregulation and mental depression. We first consider the "firm-credit channel," which posits that interstate bank branch deregulation eased firm credit constraints, which in turn boosted income and employment among workers, with positive ramifications on mental health. As demonstrated by Rice and Strahan (2010), interstate bank branch deregulation eased firm credit constraints. As shown above, interstate bank branch deregulation reduced mental depression among low-income workers. We now assess whether income, employment, and mental health improved primarily among individuals most likely to be affected by an easing of firm credit triggered by interstate bank branch deregulation.

To explore the firm-credit channel, we differentiate counties by the degree to which firms in each county depend on external finance, where banks are the major providers of external finance. The motivation is as follows: If branch deregulation improves mental health by easing firm credit constraints and enhancing the economic conditions of workers, then we should find an especially pronounced impact of deregulation on the economic conditions and mental health of workers in counties where bank branch deregulation is likely to have the biggest effect on firms: counties with firms that depend heavily on banks for external finance. To examine this channel, we follow Rajan and Zingales (1998) and differentiate counties by the degree to which firms are financially dependent. We then examine whether interstate branch deregulation exerts an especially pronounced effect on mental health, employment, and income among low-income workers in counties dominated by financially-dependent firms. As a robustness check, we differentiate counties by the density of bank branches before bank branch deregulation. Holding other features of the counties constant, we expect that bank branch deregulation will have a bigger effect on economic conditions and mental health in "under-banked" counties than in counties that are already densely banked before deregulation.

Second, we consider the "consumer-credit channel." The consumer-credit channel suggests that bank deregulation eases individual credit constraints, which in turn allows individuals to reduce economic stress, with positive ramifications on mental health. To shed some empirical light on the consumer-credit channel, we assess whether interstate bank branch deregulation triggers increased borrowing among the same group of individuals who experience a drop in mental depression: low-income workers.

5.1 Firm-credit Channel: External Financial Dependence (EFD)

We now examine whether interstate bank branch deregulation triggered improvements in income, employment, and mental health among individuals in counties where bank branch deregulation is most likely to ease firm-credit constraints: counties with firms that depend heavily on banks for external finance. We divide counties into those with firms that depend heavily on external finance dependence (EFD) and those that do not. To obtain county-level EFD, we first follow prior studies (Rajan and Zingales, 1998; Duchin, Ozbas and Sensoy, 2010) and define each firm's EFD as the ratio of capital expenditures minus net cash flows from operating activities over the capital expenditures. We obtain data from Compustat and calculate the firm-year EFD over a long time-series window 1980-2000. We first aggregate firm-level values to the 3-digit SIC industry-level and calculate annual EFD for that industry. We next take the median of industry-year EFD over the long window (1980-2000) as the measurement of industry-level EFD. To arrive at the county-level EFD, we retrieve data from County Business Patterns (CBP) administered by the U.S. Census and compute the employment-weighted EFD across all 3-digit SIC industries for each county-year. Finally, we average the county-year EFD over the pre-shock period 1989-1991 to gauge a persistent measurement of county-level EFD. We split the low-income group sample into low county EFD and high county EFD based on the county EFD median. The results are reported in Table 7.

In line with the firm-credit channel view, we find that low-income individuals living in high EFD counties experience large improvements in mental health, employment, and income following interstate branch deregulation but low-income individuals living in low EFD counties do not. When focusing on low-income individuals in counties most likely to be influenced by deregulation (high EFD counties), the estimated effect of branch deregulation on mental health is large. From column (1) of Table 7, one more degree of interstate bank branch deregulation is associated with a reduction in the Depression Index of 0.826 among low-income individuals in high EFD counties, which represents a 23.5% drop relative to the sample mean. Table 7 results are consistent with the view that interstate branch deregulation eases credit conditions among firms that depend on banks for external finance and that this easing of credit constraints improves the economic conditions of workers with positive repercussion on mental health. Furthermore, consistent with the findings in Beck, Levine, and Levkov (2010) that

improvements in bank operations exert a disproportionately positive influence on low-income workers, we find that the positive effect of interstate branch deregulation on employment, income, and mental health occurs among low-income individuals in high EFD counties.

We also differentiate counties by bank density. The hypothesized economic mechanism is as follows: The impact of interstate branch deregulation on firm-credit conditions in a county will be larger if the county had lower bank density prior to interstate branch deregulation than if the county was already heavily banked. Namely, since deregulation will tend to have bigger positive effect on the availability of banking services and credit in previously under-banked counties than in already densely-banked counties, deregulation will improve employment, income, and mental health more in counties with low-density banking prior to deregulation. To assess this view, we compile county-level branch density data, which is available from June 1994, from the Sum of Deposits (SOD) files supported by Federal Deposit Insurance Corporate (FDIC). We use pre-deregulation branch data from 1994 and compute the total number of branches per county scaled by total county population. We split counties into low- and high-density counties based on the median of this branch per capita indicator.

These analyses also yield results consistent with the firm-credit channel view. As shown in Table 8, we find that low-income individuals living in low pre-deregulation branch density counties experience large improvements in employment, income, and mental health following interstate branch deregulation. In contrast, low-income individuals living in high pre-deregulation branch density counties do not experience significant gains in employment, income or mental health. As with the county-level EFD results, these results on pre-deregulation branch density at the county-level also support the firm-credit channel.

5.2 Consumer-Credit Channel

We now consider the "consumer-credit channel." Applied to our study of branch deregulation and mental health, this channel suggests that interstate bank branch deregulation improves credit conditions for individuals, so that they can borrow to smooth the vagaries of economic life, reducing stress and mental illness. We shed empirical light on this potential channel from interstate branch deregulation to mental depression by using two measures of individual borrowing. *Leverage* equals the ratio of total liabilities excluding mortgages on residential property (e.g., debts on farm/business/other property, debts on vehicles etc.) over total

assets excluding the market value of residential property (e.g., total amount of money assets like savings, market value of farm/business/other property, market value of all vehicles and all other assets worth more than $500 etc.). *D/I Ratio* is the ratio of total liabilities excluding mortgages on residential property as defined above over respondent's total income (including wages, salaries, and income from farm or business).

As shown in Table 9, we find no evidence that interstate branch deregulation facilitates borrowing by individuals most affected by deregulation: low-income workers. We also show that the lack of an association between interstate branch deregulation and borrowing by individuals holds in low- and high-EFD counties and in low and high pre-deregulation branch density counties.

6. Conclusion

In this paper, we examine the question: Do bank regulatory reforms that improve local credit conditions reduce the incidence of mental depression? Research suggests both that (1) the removal of restrictions on interstate bank branching eases credit conditions, spurs entrepreneurship, and boosts earnings, especially the earnings of low-income workers, and (2) economic duress, including low-incomes and unemployment, tends to increase mental depression. Combined, these strands of research motivate the hypothesis that we examine: Bank regulatory reforms that improve economic conditions will tend to reduce mental depression, especially among low-income workers. Since improvement in the operation of banking systems tends to spur "churn," the more rapid entry and exit of firms, this can create uncertainty and anxiety among workers that increase mental distress.

We discover that the lowering of regulatory impediments to interstate branching reduced mental health disease among low-income households, especially in counties dominated by firms that depend heavily on banks. These results also hold when using a spatial regression discontinuity design to compare contiguous counties across state borders with different interstate branch regulations. On the mechanisms linking credit conditions and mental health, we find that interstate branch deregulation boosted employment and income among low-income workers in counties dominated by bank-dependent firms, which is consistent with the firm-credit channel argument that interstate bank branch deregulation eased firm credit constraints, which in turn boosted income and employment among workers, with positive ramifications on mental health.

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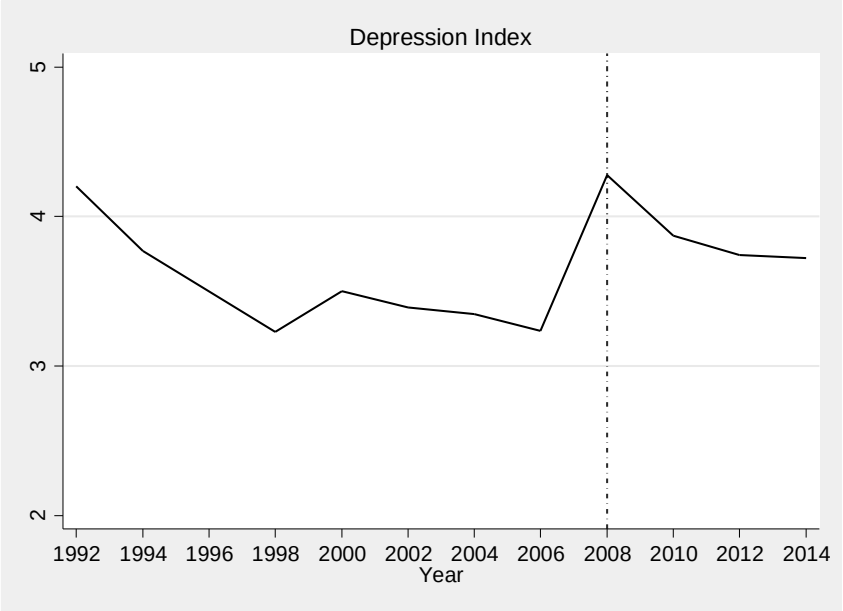

Figure 1. Annual Trend of Total Score of CES-Depression Scale

This figure plots the time-series trend of the total score of CES-Depression Scale over the period 1992 to 2014. Total score ranges from 0 (least depressed) to 21 (most depressed), measuring the severity of individuals' mental health distress. The data sources from NLSY79 panels surveys administered by the BLS.

Table 1. Summary Statistics

This table summarizes descriptive statistics for the main variables. The sample period ranges from 1992 to 2005, in line with the data availability for our key mental health variables. Each respondent is surveyed three times over the depression symptoms, the first in 1992, the second in 1994 and the final when (s)he turns age 40 (over 1998-2005). Our variable of interest, *IBBEA Index*, takes the value from 0 (most restrictive) to 4 (most deregulated). All other variables are defined in Appendix 1.

Variable	N	Mean	S.D.	Min	Median	Max
State-Level Bank Branching Deregulation						
IBBEA Index	714	1.307	1.479	0	1	4
CES-Depression Scale						
Depression Index	14,299	3.508	3.960	0.000	2.000	21.000
D-Depression Index Above 8	14,299	0.136	0.342	0.000	0.000	1.000
D-Depression Index Above 10	14,299	0.082	0.275	0.000	0.000	1.000
D-Depression Index Above 12	14,299	0.052	0.223	0.000	0.000	1.000
% of Answers “0”	14,299	0.676	0.298	0.000	0.714	1.000
% of Answers “1”	14,299	0.200	0.216	0.000	0.143	1.000
% of Answers “2”	14,299	0.072	0.138	0.000	0.000	1.000
% of Answers “3”	14,299	0.053	0.138	0.000	0.000	1.000
Trouble Eating	14,299	0.332	0.732	0.000	0.000	3.000
Trouble Concentrating	14,299	0.527	0.822	0.000	0.000	3.000
Feel Depressed	14,299	0.385	0.747	0.000	0.000	3.000
Everything an Effort	14,299	0.658	0.988	0.000	0.000	3.000
Trouble sleeping	14,299	0.728	0.983	0.000	0.000	3.000
Feel Sad	14,299	0.386	0.720	0.000	0.000	3.000
Lethargic	14,299	0.493	0.779	0.000	0.000	3.000
Labor Market Outcomes						
D-WorkHours	16,107	0.790	0.408	0.000	1.000	1.000
Log(WorkHours)	16,107	5.778	3.051	0.000	7.418	8.269
Log(EmpWeeks)	16,264	2.991	1.588	0.000	3.970	3.970
Log(TotalIncome)	15,443	7.574	4.183	0.000	9.699	11.963
Leverage Ratios						
Leverage	12,154	0.671	1.751	0.000	0.146	12.000
D/I Ratio	10,361	0.695	1.558	0.000	0.151	8.338
State-Level Controls						
Log(GSP Per Capita)	714	10.64	0.248	10.168	10.618	12.041
Log(Population)	714	15.008	1.031	13.052	15.139	17.403

Table 2. Bank Branching Deregulation and Total Score of CES-Depression Scale

This table reports OLS regression results of the effect of the interstate bank branching deregulation on total score of CES- Depression Scale over 1992 to 2005. Each respondent has three observations for *Depression Index*, one in 1992, one in 1994 and one when (s)he turns age 40. Column (1) to (3) report the results conditioning on state and gender-race-year fixed effects, and column (4) to (6) further include individual fixed effects. Column (1) and (4) report the results in the full sample, and column (2) and (3), (5) and (6) report results in the low- and high-income group respectively. The dependent variable is *Depression Index*, ranging from 0 (least depressed) to 21 (most depressed). The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). *Education* denotes the highest grade/years of schooling completed by the respondent, ranging from 0 (never attend school) to 20 (8th year college or more). *Age* is the difference between the birth year and the survey year. *FamilyIncome7981* is the natural logarithm of one plus the average total family income (in 2010 dollars) over 1979 to 1981. *MotherEducation* and *FatherEducation* measure maximum years of schooling received by the respondent's parents. *D-LiveWithParents* equals one if the respondent lived with both parents at the age 14. *AFQTAbilityTest* is the normalized percentile score after controlling for age groups among all the respondents in the 1980 survey. A higher percentile indicates better learning aptitude. *RosenbergSelfEsteem* is an aggregate score ranging from 0 to 30 in the 1987 survey to measure the respondent's self-evaluation of personal worth. A higher value indicates a higher level of self-esteem. *PearlinSenseOfControl* is an aggregate score ranging from 7 to 28 in the 1992 survey to measure the respondent's sense of control over one's life. A higher value indicates a more positive self-concept and a stronger internal control over one's destiny. *D-RiskAttitude* is a dummy variable that equals one if the respondent answers “Yes” facing the question “Would you take job that could either double family income or cut income by a third” in the 1993 survey, and zero otherwise. State controls include log of GSP per capita and log of total population. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. We test the coefficient difference between the high- and low-income group and p-value is reported in the last row. *, **, and *** indicate significance at 10%, 5%, and 1%.

	Full Sample	Low Income	High Income	Full Sample	Low Income	High Income
	Depression Index	Depression Index	Depression Index	Depression Index	Depression Index	Depression Index
	(1)	(2)	(3)	(4)	(5)	(6)
IBBEA Index	-0.140**	-0.284**	-0.0531	-0.119**	-0.297**	0.00689
	(-2.34)	(-3.19)	(-0.86)	(-2.29)	(-3.21)	(0.14)
Education	-0.0637**	-0.0179	-0.0824**			
	(-2.74)	(-0.61)	(-2.88)			
Age	-0.0259	-0.00650	-0.0263			
	(-1.31)	(-0.16)	(-1.21)			
FamilyIncome7981	-0.253***	-0.335**	-0.109			
	(-3.55)	(-2.76)	(-1.42)			
MotherEducation	-0.00129	0.0130	-0.00830			
	(-0.06)	(0.38)	(-0.35)			
FatherEducation	0.0165	0.0230	0.00629			
	(0.83)	(0.62)	(0.35)			
D-BothParents	-0.383**	-0.580**	-0.211			
	(-2.56)	(-2.57)	(-1.31)			
AFQTAbilityTest	-1.116***	-1.439***	-0.553**			
	(-5.59)	(-5.00)	(-2.12)			
RosenbergSelfEsteem	-0.0898***	-0.109***	-0.0562**			
	(-7.29)	(-5.42)	(-3.11)			
PearlinSenseOfControl	-0.243***	-0.302***	-0.192***			
	(-12.15)	(-8.59)	(-9.29)			
D-RiskAttitude	0.277**	0.361**	0.202*			
	(2.71)	(2.43)	(1.69)			
Log(GSP Per Capita)	0.661	0.783	0.252	-0.452	-1.710	0.745
	(0.42)	(0.32)	(0.20)	(-0.33)	(-0.77)	(0.61)
Log(Population)	-0.458	-0.786	-0.208	-0.257	-0.676	0.0706
	(-1.42)	(-1.43)	(-0.57)	(-0.68)	(-0.83)	(0.25)
State FE	Yes	Yes	Yes			

Individual FE				Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation	14299	6612	7687	14299	6612	7687
R-Squared	0.133	0.123	0.0997	0.377	0.375	0.326
P-Value			0.016			0.004

Table 3. Bank Branching Deregulation and Answers' Distribution of CES-Depression Scale

This table reports OLS regression results of the effect of the interstate bank branching deregulation on the choice distribution of the CES-Depression Scale in the low-income group over 1992 to 2005. *D-Depression Index Above 8, D-Depression Index Above 10, D-Depression Index Above 12* respectively represents a dummy variable that equals one if *Depression Index* is above the cutoff 8/10/12, and zero otherwise. This set of dummies can measure the likelihood of clinical major depression. CES-Depression Scale is made up of seven statements evaluating the level of depression symptoms over the last week and respondents choose from the following four alternatives as their ratings: (1) Rarely/None of the time/1 Day (respondents choose 0 as the answer), (2) Some/A little of the time/1-2 Days (respondents choose 1 as the answer), (3) Occasionally/Moderate amount of the time/3-4 Days (respondents choose 2 as the answer), (4) Most/All of the times/5-7 Days (respondents choose 3 as the answer). *% of Answers "0," % of Answers "1," % of Answers "2" and % of Answers "3"* respectively denotes the percentage of choosing 0/1/2/3 as the ratings among the seven statements. The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%.

Low Income Group							
	D-Depression Index Above 8	D-Depression Index Above 10	D-Depression Index Above 12	% of Answers "0"	% of Answers "1"	% of Answers "2"	% of Answers "3"
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IBBEA Index	-0.0145*	-0.0178**	-0.0142**	0.0167**	-0.00177	-0.00412	-0.0108**
	(-1.82)	(-2.54)	(-2.40)	(3.40)	(-0.37)	(-1.46)	(-2.58)
Log(GSP Per Capita)	-0.113	-0.197	-0.111	0.0406	0.114	-0.106	-0.0487
	(-0.54)	(-0.94)	(-0.54)	(0.25)	(0.80)	(-1.41)	(-0.58)
Log(Population)	-0.0579	-0.0536	-0.0399	0.0448	-0.0156	-0.00685	-0.0224
	(-0.97)	(-1.27)	(-0.89)	(1.04)	(-0.66)	(-0.43)	(-0.63)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	6612	6612	6612	6612	6612	6612	6612
R-Squared	0.255	0.225	0.179	0.401	0.224	0.146	0.259

Table 4. Bank Branching Deregulation and Seven Dimensions of CES-Depression Scale

This table reports OLS regression results of the effect of the interstate bank branching deregulation on seven dimensions of the CES-Depression Scale in the low-income group over 1992 to 2005. CES-Depression Scale is made up of seven statements evaluating the level of depression symptoms over the last week and respondents choose from the following four alternatives as their ratings: (1) Rarely/None of the time/1 Day (respondents choose 0 as the answer), (2) Some/A little of the time/1-2 Days (respondents choose 1 as the answer), (3) Occasionally/Moderate amount of the time/3-4 Days (respondents choose 2 as the answer), (4) Most/All of the times/5-7 Days (respondents choose 3 as the answer). *Trouble Eating* is "I did not feel like eating; my appetite was poor". *Trouble Concentrating* is "I had trouble keeping my mind on what I was doing". *Feel Depressed* is "I feel depressed". *Everything an Effort* is "I felt that everything I did was an effort". *Trouble sleeping* is "My sleep was restless". *Feel Sad* is "I felt sad". *Lethargic* is "I could not get 'going'". The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%.

Low Income Group							
	Trouble Eating	Trouble Concentrating	Feel Depressed	Everything an Effort	Trouble sleeping	Feel Sad	Lethargic
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IBBEA Index	-0.0131	-0.0771***	-0.0566**	-0.0348**	-0.0509**	-0.0498**	-0.0151
	(-0.97)	(-4.15)	(-3.16)	(-2.12)	(-2.10)	(-2.85)	(-0.73)
Log(GSP Per Capita)	0.0548	-0.493	-0.0490	0.272	-0.372	-0.431	-0.693
	(0.18)	(-1.15)	(-0.10)	(0.65)	(-0.51)	(-1.06)	(-1.66)
Log(Population)	0.00874	-0.168*	-0.0611	-0.323**	-0.114	-0.103	0.0848
	(0.05)	(-1.76)	(-0.45)	(-2.63)	(-0.58)	(-1.03)	(0.74)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	6612	6612	6612	6612	6612	6612	6612
R-Squared	0.268	0.230	0.301	0.279	0.255	0.240	0.239

Table 5. Bank Branching Deregulation and CES-Depression Scale-Robustness Checks

This table reports robustness checks on OLS regression results of the effect of the interstate bank branching deregulation on the CES-Depression Scale in the low-income group over 1992 to 2005, by further considering state-level linear time trends. *Depression Index* ranges from 0 (least depressed) to 21 (most depressed). *D-Depression Index Above 8, D-Depression Index Above 10, D-Depression Index Above 12* respectively represents a dummy variable that equals one if *Depression Index* is above the cutoff 8/10/12, and zero otherwise. This set of dummies can measure the likelihood of clinical major depression. The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects, as well as state-level linear time trends in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%.

Low Income Group				
	Depression Index	D-Depression Index Above 8	D-Depression Index Above 10	D-Depression Index Above 12
	(1)	(2)	(3)	(4)
IBBEA Index	-0.522**	-0.0380**	-0.0309*	-0.0253*
	(-3.19)	(-2.07)	(-1.73)	(-1.71)
Log(GSP Per Capita)	1.107	-0.0242	-0.0411	0.109
	(0.41)	(-0.09)	(-0.18)	(0.46)
Log(Population)	-1.341*	-0.0813	-0.0841*	-0.0752
	(-1.70)	(-1.29)	(-1.96)	(-1.64)
Individual FE	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes
StateLinearTrends	Yes	Yes	Yes	Yes
Observation	6612	6612	6612	6612
R-Squared	0.381	0.259	0.228	0.184

Table 6. Spatial Regression Discontinuity Design

This table presents OLS regression results of the effect of the interstate bank branching deregulation on the CES-Depression Scale over 1992 to 2005. Odd columns report the results in the low-income group and even columns report the results in the high income. We exploit a spatial regression discontinuity design and restrict the sample to the contiguous county-pairs across the state borders. *Depression Index* ranges from 0 (least depressed) to 21 (most depressed) and measures the severity of depression symptoms. *D-Depression Index Above 8, D-Depression Index Above 10, D-Depression Index Above 12* respectively represents a dummy variable that equals one if *Depression Index* is above the cutoff 8/10/12, and zero otherwise. This set of dummies can measure the likelihood of clinical major depression. The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include county-pair and gender-race-year fixed effects, as well as state-level linear time trends in all columns. Heteroskedasticity-robust standard errors clustered at the county-pair level are in parentheses. We test the coefficient difference between the high- and low-income and p-value is reported in the last row. *, **, and *** indicate significance at 10%, 5%, and 1%.

	Depression Index		D-Depression Index Above 8		D-Depression Index Above 10		D-Depression Index Above 12	
	Low Income	High Income	Low Income	High Income	Low Income	High Income	Low Income	High Income
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IBBEA Index	-0.300**	0.0757	-0.0284***	-0.000380	-0.0297***	0.00665	-0.0272***	0.00231
	(-2.86)	(0.92)	(-3.37)	(-0.05)	(-3.71)	(1.07)	(-3.80)	(0.48)
Log(GSP Per Capita)	0.350	-0.341	0.0179	0.243	0.00437	0.263**	-0.0709	0.0823
	(0.27)	(-0.21)	(0.14)	(1.61)	(0.05)	(2.58)	(-1.07)	(1.04)
Log(Population)	-0.988***	0.699**	-0.0742***	-0.0193	-0.0607**	-0.00839	-0.0730**	-0.000907
	(-3.95)	(2.16)	(-3.67)	(-0.93)	(-2.43)	(-0.41)	(-2.78)	(-0.05)
County-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
StateLinearTrends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	4521	4889	4521	4889	4521	4889	4521	4889
R-Squared	0.219	0.131	0.172	0.0843	0.156	0.0558	0.122	0.0516
P-Value	0.003		0.007		0.001		0.001	

Table 7. Labor Market Outcomes: Cross-County Heterogeneity by Local External Finance Dependence

This table presents OLS regression results of the firm-credit channel tests by exploiting the heterogeneous responses in the low income group between residents living in counties with high` and low external finance dependence (EFD). Following the literature (Rajan and Zingales 1998; Duchin, Ozbas and Sensoy 2010), we define EFD as the ratio of capital expenditures minus net cash flows from operating activities over the capital expenditures. We first aggregate firm-level values to the 3-digit SIC industry-level and calculate annual EFD for each industry. We next take the median of industry-year EFD over the long window (1980-2000) as the measurement of industry-level EFD. To arrive at the county-level EFD, we compute the employment-weighted EFD across all 3-digit SIC industries for each county-year. Then we average the county-year EFD over the pre-shock period 1989-1991 to gauge a persistent measurement of county-level EFD. We split the low-income group sample into low county EFD and high county EFD based on the county EFD median. *Depression Index* ranges from 0 (least depressed) to 21 (most depressed) and measures the severity of depression symptoms. *D-WorkHours* is a dummy variable that equals one if the respondent participates in the job market and has positive working hours in a given year, and zero otherwise. *Log(WorkHours)* denotes natural logarithm of one plus total number of hours worked in a given year. *Log(EmptWeeks)* denotes the natural logarithm of one plus total employment weeks in a given year. *Log(TotalIncome)* is the natural logarithm of one plus the respondent's total income (in 2010 dollars), including wages, salaries, and income from farm or business. The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects, as well as state-level linear time trends in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. We test the coefficient difference between the high and low EFD counties and p-value is reported in the last row. *, **, and *** indicate significance at 10%, 5%, and 1%.

	Depression Index		D-WorkHours		Log(WorkHours)		Log(EmpWeeks)		Log(TotalIncome)	
	High EFD	Low EFD	High EFD	Low EFD	High EFD	Low EFD	High EFD	Low EFD	High EFD	Low EFD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IBBEA Index	-0.826**	-0.225	0.0193**	0.00148	0.130**	0.0153	0.0730**	-0.000697	0.205**	-0.00390
	(-2.56)	(-1.14)	(2.71)	(0.23)	(2.35)	(0.37)	(2.38)	(-0.03)	(2.42)	(-0.06)
Log(GSP Per Capita)	1.019	-0.0186	0.251	0.142	2.284	1.529	1.178	0.907	2.051	2.263
	(0.32)	(-0.00)	(1.26)	(0.66)	(1.59)	(1.18)	(1.56)	(1.35)	(0.93)	(1.13)
Log(Population)	-1.378	-0.889	0.0266	-0.0974	-0.121	-0.193	-0.121	-0.0205	-0.192	-4.501
	(-1.07)	(-1.10)	(0.71)	(-0.93)	(-0.40)	(-0.30)	(-0.76)	(-0.07)	(-0.47)	(-1.45)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
StateLinearTrends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	3098	3479	7537	8503	7537	8503	7610	8587	7220	8164
R-Squared	0.410	0.356	0.490	0.492	0.532	0.533	0.521	0.521	0.535	0.553
P-Value	0.147		0.017		0.025		0.010		0.024	

Table 8. Labor Market Outcomes: Cross-County Heterogeneity by Local Credit Condition

This table presents OLS regression results of the firm-credit channel tests by exploiting the heterogeneous responses in the low-income group between residents living in counties with high and low branch density. We utilize the pre-shock branch density data in 1994 and first totalize the county-level number of branches before the deregulation. We then scale this raw density by county total population. We split the low-income group sample into high county branch density and low county branch density based on the county density median. *Depression Index* ranges from 0 (least depressed) to 21 (most depressed) and measures the severity of depression symptoms. *D-WorkHours* is a dummy variable that equals one if the respondent participates in the job market and has positive working hours in a given year, and zero otherwise. *Log(WorkHours)* denotes natural logarithm of one plus total number of hours worked in a given year. *Log(EmpWeeks)* denotes the natural logarithm of one plus total employment weeks in a given year. *Log(TotalIncome)* is the natural logarithm of one plus the respondent's total income (in 2010 dollars), including wages, salaries, and income from farm or business. The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects, as well as state-level linear time trends in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. We test the coefficient difference between the high and low branch density counties and p-value is reported in the last row. *, **, and *** indicate significance at 10%, 5%, and 1%.

	Depression Index		D-WorkHours		Log(WorkHours)		Log(EmpWeeks)		Log(TotalIncome)	
	High Density	Low Density	High Density	Low Density	High Density	Low Density	High Density	Low Density	High Density	Low Density
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IBBEA Index	-0.109	-1.077**	-0.00389	0.0327***	-0.0280	0.237***	-0.0117	0.113***	0.00562	0.225**
	(-0.50)	(-2.87)	(-0.69)	(4.55)	(-0.69)	(4.33)	(-0.55)	(3.73)	(0.08)	(2.83)
Log(GSP Per Capita)	0.430	1.623	0.213	0.137	1.953	1.621*	1.232	0.727	0.607	2.629**
	(0.11)	(0.54)	(0.87)	(0.96)	(1.16)	(1.74)	(1.41)	(1.60)	(0.22)	(2.02)
Log(Population)	-1.346	-1.214	0.0718	-0.0225	0.569	-0.540	0.132	-0.287	-1.495	-0.916*
	(-1.46)	(-1.03)	(0.70)	(-0.59)	(0.74)	(-1.59)	(0.40)	(-1.57)	(-1.09)	(-2.00)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
StateLinearTrends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	3384	3149	8260	7651	8260	7651	8351	7715	7916	7330
R-Squared	0.412	0.343	0.514	0.464	0.559	0.499	0.549	0.486	0.564	0.520
P-Value	0.048		0.000		0.000		0.000		0.011	

Table 9. Bank Branching Deregulation and Leverage

This table reports OLS regression results of the effect of the interstate bank branching deregulation on leverage condition in the low-income group over 1992 to 2005. *Leverage* is the ratio of total liabilities excluding mortgages on residential property (e.g., debts on farm/business/other property, debts on vehicles etc.) over total assets excluding market value of residential property (e.g., total amount of money assets like savings, market value of farm/business/other property, market value of all vehicles and all other assets worth more than $500 etc.). *D/I Ratio* is the ratio of total liabilities excluding mortgages on residential property (e.g., debts on farm/business/other property, debts on vehicles etc.) over respondent's total income (including wages, salaries, and income from farm or business). The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects, as well as state-level linear time trends in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. We test the coefficient difference between the high and low group and p-value is reported in the last row. *, **, and *** indicate significance at 10%, 5%, and 1%.

	Leverage		D/I Ratio		Leverage		D/I Ratio	
	High EFD	Low EFD	High EFD	Low EFD	High Density	Low Density	High Density	Low Density
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IBBEA Index	0.0602	-0.0445	-0.0291	-0.0175	-0.0121	0.0191	-0.0145	-0.0398
	(1.18)	(-1.04)	(-0.51)	(-0.68)	(-0.42)	(0.38)	(-0.39)	(-1.09)
Log(GSP Per Capita)	-0.984	-1.187	-0.0223	-2.560	-0.854	-1.402	-2.721*	0.331
	(-0.84)	(-0.86)	(-0.02)	(-1.67)	(-0.70)	(-1.33)	(-1.80)	(0.32)
Log(Population)	-0.195	-0.409	-0.268	-0.551	0.200	-0.153	-0.482	-0.715
	(-0.71)	(-0.91)	(-0.88)	(-0.70)	(1.24)	(-0.80)	(-1.08)	(-1.60)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
StateLinearTrends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	5589	6511	4769	5528	6292	5718	5384	4853
R-Squared	0.255	0.356	0.254	0.286	0.350	0.258	0.278	0.259
P-Value	0.155		0.859		0.506		0.687	

Appendix 1: Variable Definition

Variable	Definition	Source
Bank Branching Deregulation		
IBBEA Index	We follow RS (2010) and contrast the index ranging from 0 (most restrictive) to 4 (most deregulated). We add one point to the index if the state (1) does not impose a minimum age restriction for acquisition, (2) allows de novo interstate branching, (3) permits interstate branching by acquiring a single branch; (4) sets the deposit-cap no less than 30%.	Rice and Strahan (2010)
CES-Depression Scale		
Depression Index	A total score of seven items measuring symptoms of depression, ranging from 0 (least depressed) to 21 (most depressed).	NLSY79
D-Depression Index Above 8	A dummy variable that equals one if Depression Index is above the cutoff 8, and zero otherwise.	NLSY79
D-Depression Index Above 10	A dummy variable that equals one if Depression Index is above the cutoff 10, and zero otherwise.	NLSY79
D-Depression Index Above 12	A dummy variable that equals one if Depression Index is above the cutoff 12, and zero otherwise.	NLSY79
% of Answers "0"	Percentage of choosing 0 (Rarely/None of the time/1 Day) as the ratings among seven statements measuring symptoms of depression.	NLSY79
% of Answers "1"	Percentage of choosing 1 (Some/A little of the time/1-2 Days) as the ratings among seven statements measuring symptoms of depression.	NLSY79
% of Answers "2"	Percentage of choosing 2 (Occasionally/Moderate amount of the time/3-4 Days) as the ratings among seven statements measuring symptoms of depression.	NLSY79
% of Answers "3"	Percentage of choosing 3 (Most/All of the times/5-7 Days) as the ratings among seven statements measuring symptoms of depression.	NLSY79
CES-Depression 7 Dimensions	For each statement below, respondents choose from the following four alternatives as their ratings for the feelings over the past week: (1) Rarely/None of the time/1 Day (respondents choose 0 as the answer), (2) Some/A little of the time/1-2 Days (respondents choose 1 as the answer), (3) Occasionally/Moderate amount of the time/3-4 Days (respondents choose 2 as the answer), (4) Most/All of the times/5-7 Days (respondents choose 3 as the answer).	
Trouble Eating	I did not feel like eating; my appetite was poor.	NLSY79
Trouble Concentrating	I had trouble keeping my mind on what I was doing.	NLSY79
Feel Depressed	I feel depressed.	NLSY79
Everything an Effort	I felt that everything I did was an effort.	NLSY79
Trouble sleeping	My sleep was restless.	NLSY79
Feel Sad	I felt sad.	NLSY79
Lethargic	I could not get "going".	NLSY79
Labor Market Outcomes		
D-WorkHours	A dummy variable that equals one if the respondent participates in the job market and has positive working hours in a given year, and zero otherwise.	NLSY79
Log(WorkHours)	Natural logarithm of one plus total number of hours worked in a given year.	NLSY79
Log(EmpWeeks)	Natural logarithm of one plus total employment weeks in a given year.	NLSY79

Log(TotalIncome)	Natural logarithm of one plus the respondent's total income (in 2010 dollars), including wages, salaries, and income from farm or business.	NLSY79
Leverage Ratio		
Leverage	The ratio of total liabilities excluding mortgages on residential property (e.g., debts on farm/business/other property, debts on vehicles etc.) over total assets excluding market value of residential property (e.g., total amount of money assets like savings, market value of farm/business/other property, market value of all vehicles and all other assets worth more than $500 etc.).	NLSY79
D/I Ratio	The ratio of total liabilities excluding mortgages on residential property (e.g., debts on farm/business/other property, debts on vehicles etc.) over respondent's total income (including wages, salaries, and income from farm or business).	NLSY79
Individual-Level Characteristics		
Education	Highest grade/years of schooling completed by the respondent, ranging from 0 (never attend school) to 20 (8th year college or more).	NLSY79
Age	The difference between the birth year and the survey year.	NLSY79
FamilyIncome7981	Natural logarithm of one plus the average total family income (in 2010 dollars) over 1979 to 1981.	NLSY79
MotherEducation	Maximum years of schooling received by the respondent's mother.	NLSY79
FatherEducation	Maximum years of schooling received by the respondent's father.	NLSY79
D-BothParents	A dummy variable that equals one if the respondent lived with both parents at the age 14.	NLSY79
AFQTAbilityTest	Normalized percentile score after controlling for age groups among all the respondents in the 1980 Armed Forces Qualification Test (AFQT), which covers arithmetic reasoning, work knowledge, paragraph comprehension and numerical operations. Scores for the four sections were summed to form an aggregate AFQT score. A higher percentile indicates better learning aptitude.	NLSY79
RosenbergSelfEsteem	An aggregate score ranging from 0 to 30 in the 1987 survey to measure the respondent's self-evaluation of personal worth. A higher value indicates a higher level of self-esteem.	NLSY79
PearlinSenseOfControl	An aggregate score ranging from 7 to 28 in the 1992 survey to measure the respondent's sense of control over one's life. A higher value indicates a more positive self-concept and a stronger internal control over one's destiny.	NLSY79
D-RiskAttitude	A dummy variable that equals one if the respondent answers "Yes" facing the question "Would you take job that could either double family income or cut income by a third" in the 1993 survey, and zero otherwise.	NLSY79
State-Level Controls		
Log(GSP Per Capita)	Natural logarithm of state-level GSP per capita (in 2010 dollars).	BEA
Log(Population)	Natural logarithm of state-level total population.	BEA
Partitioning Variables		
Individual-Level Partitioning Variable		
Income Group	We first average total income (in 2010 dollars), including wages, salaries and income from farm or business, for each respondent over a three-year window (1989-1991) just before the sample period (1992-2005). We then divide the whole sample into high and low groups based on the state median income.	NLSY79

County-Level Partitioning Variables

External Finance Dependence	Following the literature (Rajan and Zingales, 1998; Duchin, Ozbas and Sensoy, 2010), we define EFD as the ratio of capital expenditures minus net cash flows from operating activities over the capital expenditures. We first aggregate firm-level values to the 3-digit SIC industry-level and calculate annual EFD for each industry. We next take the median of industry-year EFD over the long window (1980-2000) as the measurement of industry-level EFD. To arrive at the county-level EFD, we compute the employment-weighted EFD across all 3-digit SIC industries for each county-year. Then we average the county-year EFD over the pre-shock period 1989-1991 to gauge a persistent measurement of county-level EFD. We split the low-income group sample into low county EFD and high county EFD based on the county EFD median.	Compustat, CBP
Branch Density	We utilize the pre-shock branch density data in 1994 and first totalize the county-level number of branches before the deregulation. We then scale this raw density by county total population. We split the low-income group sample into high county branch density and low county branch density based on the county density median.	FDIC

Table OA1. Online Appendix. Bank Branching Deregulation and Clinical Depression Severity

This table repeats table 3 and reports OLS regression results of the effect of the interstate bank branching deregulation on the choice distribution of the CES-Depression Scale in the high-income group over 1992 to 2005. *D-Depression Index Above 8, D-Depression Index Above 10, D-Depression Index Above 12* respectively represents a dummy variable that equals one if *Depression Index* is above the cutoff 8/10/12, and zero otherwise. This set of dummies can measure the likelihood of clinical major depression. CES-Depression Scale is made up of seven statements evaluating the level of depression symptoms over the last week and respondents choose from the following four alternatives as their ratings: (1) Rarely/None of the time/1 Day (respondents choose 0 as the answer), (2) Some/A little of the time/1-2 Days (respondents choose 1 as the answer), (3) Occasionally/Moderate amount of the time/3-4 Days (respondents choose 2 as the answer), (4) Most/All of the times/5-7 Days (respondents choose 3 as the answer). *% of Answers "0," % of Answers "1," % of Answers "2" and % of Answers "3"* respectively denotes the percentage of choosing 0/1/2/3 as the ratings among the seven statements. The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%.

High Income Group							
	D-Depression Index Above 8	D-Depression Index Above 10	D-Depression Index Above 12	% of Answers "0"	% of Answers "1"	% of Answers "2"	% of Answers "3"
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IBBEA Index	0.00203	-0.000217	-0.000505	-0.000183	-0.00321	0.00597**	-0.00259
	(0.34)	(-0.05)	(-0.17)	(-0.04)	(-0.95)	(3.02)	(-1.36)
Log(GSP Per Capita)	-0.0647	0.0413	0.0903	-0.0341	-0.0222	0.0403	0.0160
	(-0.54)	(0.43)	(1.51)	(-0.26)	(-0.19)	(0.79)	(0.42)
Log(Population)	-0.00117	0.0115	-0.0239	-0.0308	0.0342	0.0138	-0.0173
	(-0.05)	(0.45)	(-1.47)	(-1.24)	(1.15)	(1.18)	(-1.67)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	7687	7687	7687	7687	7687	7687	7687
R-Squared	0.216	0.150	0.0948	0.350	0.217	0.169	0.173

Table OA2. Online Appendix. Bank Branching Deregulation and Seven Dimensions of CES-Depression Scale

This table repeats table 4 and reports OLS regression results of the effect of the interstate bank branching deregulation on seven dimensions of the CES-Depression Scale in the high-income group over 1992 to 2005. CES-Depression Scale is made up of seven statements evaluating the level of depression symptoms over the last week and respondents choose from the following four alternatives as their ratings: (1) Rarely/None of the time/1 Day (respondents choose 0 as the answer), (2) Some/A little of the time/1-2 Days (respondents choose 1 as the answer), (3) Occasionally/Moderate amount of the time/3-4 Days (respondents choose 2 as the answer), (4) Most/All of the times/5-7 Days (respondents choose 3 as the answer). *Trouble Eating* is "I did not feel like eating; my appetite was poor". *Trouble Concentrating* is "I had trouble keeping my mind on what I was doing". *Feel Depressed* is "I feel depressed". *Everything an Effort* is "I felt that everything I did was an effort". *Trouble sleeping* is "My sleep was restless". *Feel Sad* is "I felt sad". *Lethargic* is "I could not get 'going'". The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include individual and gender-race-year fixed effects in all columns. All regressions use the sample weights provided by NLSY79. Heteroskedasticity-robust standard errors clustered at the state level are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%.

High Income Group							
	Trouble Eating	Trouble Concentrating	Feel Depressed	Everything an Effort	Trouble sleeping	Feel Sad	Lethargic
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IBBEA Index	0.0154*	0.00724	0.00501	-0.00891	0.00599	-0.00706	-0.0108
	(1.68)	(0.55)	(0.48)	(-0.57)	(0.42)	(-0.61)	(-0.81)
Log(GSP Per Capita)	0.457**	-0.0811	-0.0746	0.135	0.421	-0.236	0.124
	(2.14)	(-0.29)	(-0.24)	(0.40)	(0.98)	(-0.92)	(0.40)
Log(Population)	0.0328	-0.00202	0.117*	-0.0640	0.0563	0.0734	-0.143**
	(0.34)	(-0.02)	(1.86)	(-0.70)	(0.63)	(1.33)	(-2.08)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	7687	7687	7687	7687	7687	7687	7687
R-Squared	0.195	0.182	0.191	0.275	0.241	0.205	0.244

Table OA3. Online Appendix. Spatial Regression Discontinuity Design-Robustness Checks

This table presents OLS regression results of the effect of the interstate bank branching deregulation on the CES-Depression Scale in the low-income group over 1992 to 2005 under different distance cutoffs, to mitigate cross-state lending concern. We exploit a spatial regression discontinuity design and restrict the sample to the contiguous county-pairs across the state borders. We further drop county-pairs with very close travel distance to address cross-state lending issue. We measure the distance in miles using the travel distance between two contiguous counties. *Depression Index* ranges from 0 (least depressed) to 21 (most depressed) and measures the severity of depression symptoms. The key independent variable is *IBBEA Index*, ranging from 0 (most restrictive) to 4 (most deregulated). State controls include log of GSP per capita and log of total population. We include county-pair and gender-race-year fixed effects, as well as state-level linear time trends in all columns. Heteroskedasticity-robust standard errors clustered at the county-pair level are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%.

	Drop <10 Miles Depression Index (1)	Drop <15 Miles Depression Index (2)	Drop <20 Miles Depression Index (3)	Drop <25 Miles Depression Index (4)	Drop <30 Miles Depression Index (5)
IBBEA Index	-0.276**	-0.284**	-0.355**	-0.332**	-0.317**
	(-2.61)	(-2.68)	(-2.39)	(-2.21)	(-2.04)
Log(GSP Per Capita)	0.106	-0.0258	-0.0622	-0.538	-0.298
	(0.08)	(-0.02)	(-0.04)	(-0.34)	(-0.15)
Log(Population)	-1.005***	-0.992***	-0.985***	-0.941***	-0.882**
	(-4.05)	(-3.97)	(-3.80)	(-3.56)	(-3.21)
Individual FE	Yes	Yes	Yes	Yes	Yes
Gender-Race-Year FE	Yes	Yes	Yes	Yes	Yes
StateLinearTrends	Yes	Yes	Yes	Yes	Yes
Observation	4456	4268	4082	3839	3388
R-Squared	0.220	0.224	0.228	0.228	0.230