Online Appendices for "Financial Regulation, Credit Market Dynamism, and Allocative Efficiency" (not for publication)

These Online Appendices contain more details on data and construction of the variables (Online Appendix A), the appendix tables and figures (Online Appendix B), details on the construction of large credit flows and measures of persistence (Online Appendix C), robustness results for trade credit (Online Appendix D), a discussion of possible applications of the analysis to other regulatory reforms in addition to those discussed in Section 9 (Online Appendix E).

Online Appendix A: Data and Variable Construction

In this Appendix, we provide details on the data, their sources, and the construction of the variables used in the empirical analysis.

Data Sources

Economic Activity

Data on state economic activity are provided by the Regional Economic Accounts of the Bureau of Economic Analysis (BEA). The BEA publishes annual data on nominal gross

domestic product by state using the SIC classification from 1963 until 1997 and using the NAICS classification from 1997 onwards. Because of the discontinuity in the time series of state GDP induced by the switch from the SIC industry classification to the NAICS industry classification, when considering state GDP, we restrict attention to the 1969-1997 period (observe that the data discontinuity may affect the estimates for both the levels and the growth rates of the GDP by state). We splice the data on nominal GDP by state. Real GDP data prior to 1987 are not directly available from the BEA as state level deflators were not computed before that year. In order to obtain state level series covering the periods prior to – as well as during and after – the banking deregulation, we computed real GDP by deflating the nominal state GDP data by the national GDP deflator. Sectorial labor shares are available from 1969 to 2001. Labor shares are computed as the share of the industry's employment over non-farm employment, with industries defined according to the SIC system.

To compute state level productivity we need data on capital and labor inputs in order to solve the following equation for A_{it}: $Y_{it} = A_{it}K_{it}^{\alpha}N_{it}^{1-\alpha}$, where Y_{it} is the annual state real gross domestic product, K_{it} is the state real physical capital stock, N_{it} represents the total number of annual state labor hours, and α is assumed to equal 1/3. The data on annual aggregate physical capital are obtained from Peri (2012). Peri deflates the series using the implicit capital stock price deflator from the BEA, while employing a concordance necessary to repair a separation in the time series caused by the 1997 switch from the SIC to the NAICS industry coding. The construction of the state capital stocks follows Garofalo and Yamarik (2002). This involves distributing the national capital stock by industry and

year, obtained from the BEA, to each state, industry and year according to the percentage of value added for the state, industry and year in the national value added for that industry and year, obtained from the BEA.

As for labor, because annual data by state on hours worked are only available from 2007 onwards, we use the total number of non-farm employees by state and year obtained from the Bureau of Labor Statistics, multiplied by the average number of hours worked in the state in the year. We compute the annual hours worked in each state by taking the hours worked by an average worker (based on all workers employed and working) during a work week in a particular state from the March Current Population Survey of each year and multiplying it by 46.2, which is the average number of weeks worked per year by an average U.S. worker according to Alesina, Glaeser and Sacerdote (2005).

Credit Flows

Our source for the credit flow variables is the Standard and Poor's Compustat North America, which provides data items on close to 30,000 companies that have filed with the U.S. Securities and Exchange Commission (SEC). The Compustat data items provide information on firms' Balance Sheets, Statements of Cash Flows, Income statements, and other supplemental information. We removed all firms classified under the industry group Finance, Insurance, and Real Estate. Effectively, we deleted all firms whose SIC variable (explained below) was in the interval $[6000, 7000)$. This left us with 311,699 (reduced to 218,524 for the 1969-2001 period) non-missing observations on total long-term debt (Compustat variable DLTT), which we used to compute long-term credit flows, and with 304,676

(reduced to 218,193 for the 1969-2001 period) non-missing observations on total debt in current liabilities (Compustat variable DLC), which we used in addition to total long-term debt to compute total credit flows. After further excluding companies incorporated outside the U.S. we finally arrive at 192,907 observations for DLTT and 192,640 observations for DLC. The corresponding number of companies is 24,094 after the exclusion of financial institutions, 21,734 for the 1969-2001 sample period, and 18,690 after the additional exclusion of non-U.S. companies. Thus, we have on average about 10 years of data per company for the 18,690 firms during the 1969-2001 sample period.

The subdivision among the U.S. states is based on the Compustat variable STATE, which identifies a state according to a firm's principal location.

Remarks

Firm Entry. To separate firms entering Compustat between newly created and already existing we construct a ratio of the gross book value of capital to the net book value of capital. If this ratio is not larger than 1.2 for a given firm then this firm is assumed to be newly formed. The ratio is computed as $\frac{\text{PPEGT}}{\text{PPEGT}-\text{DPACT}}$, where data item PPEGT is "Property, Plant and Equipment - Total (Gross)" and data item DPACT is "Depreciation, Depletion and Amortization (Accumulated)" as provided by Compustat.

Firm Exit. When a firm exits the Compustat database its growth rate and total credit are counted only if the reference item DLRSN, "Research Company Reason for Deletion" takes on values between 1 and 4 (exit due to acquisition or merger, bankruptcy, liquidation, or reverse acquisition). The firm is ignored for the exiting period if the reason code equals

5, 6, 7, 9, or 10 (exit due to no longer fitting the original data format, leveraged buyout, conversion to a private company, or other reasons such as no longer filing with the SEC).

Description of the Variables

Credit Flows Data.

Total Credit is the sum of short-term credit and long-term credit.

Short-Term Credit. Source: Compustat. Balance sheet annual data item DLC, "Debt in Current Liabilities - Total".

Long-Term Credit. Source: Compustat. Balance sheet annual data item DLTT, "Long-Term Debt - Total".

Economic Activity Data by States.

GDP. Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts. Annual GDP in millions of current dollars. Real GDP was computed deflating the nominal state GDP by the GDP Implicit Price Deflator.

GDP Implicit Price Deflator. Source: Bureau of Economic Analysis. Seasonally adjusted, year 2000=100. Annual series were computed by taking the average across the quarterly values. Remark: we convert nominal gross product and personal income to constant dollars using the national GDP deflator. As noted by Jayaratne and Strahan (1996), state real gross domestic product and real personal income might then be affected by changes in relative prices across states. However, most of this variation should be captured by the state and year fixed effects.

Employment. Source: Bureau of Labor Statistics. Annual total state employment

(number of jobs).

Population. Source: Bureau of the Census, Population Distribution and Population Estimates Branches. The intercensal estimate of the total resident population of states was used for all years except 1970 and 1980 when the population number corresponds to the census counts.

Physical capital. Source: Peri (2012).

Hours worked. Source: authors' calculations based on data from the March Current Population Survey and Alesina, Glaeser and Sacerdote (2005).

Regulatory Indicators.

Intrastate branching. Source: Amel (1993) and Jayaratne and Strahan (1998). The dates on intrastate branching refer to the years when the states permitted branching via merger and acquisition (generally prior the date when the states permitted de novo branching).

Interstate branching. Source: Amel (1993) and Jayaratne and Strahan (1998). The dates on interstate banking refer to the years when the states permitted entry by out-of-state banks.

Recession is an indicator variable equal to one for a particular sample year if any part of that year is associated with a contraction period (peak to trough) as determined by the National Bureau of Economic Research.

Unit banking is an indicator variable equal to one for the following states (the states that enacted the unit banking restriction): Arkansas, Colorado, Florida, Illinois, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, Oklahoma, Texas, West Virginia,

Wisconsin, and Wyoming.

Large credit flows. We partition firms into three groups: those with a debt growth rate (g_{ft}) above 18% (and aggregate them in $POSbig_{it}$), those with a debt growth rate below -18% (and aggregate them in $NEGbig_{it}$), and those with $-18\% <= g_{ft} <= 18\%$. Then, $SUMbig_{it} = POSbig_{it} + NEGbig_{it}$, $EXCbig_{it} = SUMbig_{it} - |NETbig_{it}|$, and $NETbig_{it} = POSbig_{it} - NEGbig_{it}$.

Highway expenditure. Source: Department of transportation, Federal Highway Administration. Total disbursements for highways, all levels of the government (thousands of dollars). Real highway expenditure was computed deflating the nominal highway expenditure by the GDP Implicit Price Deflator.

Indicators on high-tech industry. Source: Eurostat. Classification of the manufacturing industry according to technological intensity and based on NACE Rev.2. for compiling aggregates related to high-technology, medium high-technology, medium low-technology and low-technology.

Online Appendix B: Tables and Figures

Table B.1 (not for publication)
State deregulation dates
The second column lists the year that each state allowed branch banking through mergers and acquisitions. The third column lists the year each state entered into an interstate banking agreement with other states. * indicates that a state had not deregulated before 1994. Dates from Amel (1993) and Jayaratne and Strahan (1998).

State	Intrastate branching	Interstate banking
Alabama	1981	1987
Alaska	<1970	1982
Arizona	<1970	1986
Arkansas	1994	1989
California	<1970	1987
Colorado	1991	1988
Connecticut	1980	1983
Delaware	<1970	1988
Washington, DC	<1970	1985
Florida	1988	1985
Georgia	1983	1985
Hawaii	1986	*
Idaho	<1970	1985
Illinois	1988	1986
Indiana	1989	1986
Iowa	*	1991
Kansas	1987	1992
Kentucky	1990	1984
Louisiana	1988	1987
Maine	1975	1978
Maryland	<1970	1985
Massachusetts	1984	1983
Michigan	1987	1986
Minnesota	1993	1986
Mississippi	1986	1988
Missouri	1990	1986
Montana	1990	1993
Nebraska	1985	1990
Nevada	<1970	1985
New Hampshire	1987	1987
New Jersey	1977	1986
New Mexico	1991	1989
New York	1976	1982
North Carolina	<1970	1985
North Dakota	1987	1991
Ohio	1979	1985
Oklahoma	1988	1987
Oregon	1985	1986
Pennsylvania	1982	1986
Rhode Island	<1970	1984
South Carolina	<1970	1986
South Dakota	<1970	1988
Tennessee	1985	1985
Texas	1988	1987
Utah	1981	1984
Vermont	1970	1988
Virginia	1978	1985
Washington	1985	1987
West Virginia	1987	1988
Wisconsin	1990	1987
Wyoming	1988	1987

Table B.2 (not for publication)
Dynamic effects. Credit market deregulation and credit reallocation
The table reports regression coefficients for the impact of deregulation on credit flows within states. Robust standard errors clustered at the state level are in parentheses. All coefficients and standard errors are multiplied by 100 to ease interpretation. The dependent variables are gross credit reallocation (SUM) in columns (1) and (4), excess credit reallocation (EXC) in columns (2) and (5), and net credit growth (NET) in columns (3) and (6). Panels A and C refer to total credit, Panels B and D to long-term credit. All regressions include the labor shares of the various sectors in state non-farm employment, and state and year effects (coefficients and standard errors are not reported to conserve space). *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit			Panel B: Long-term Credit		
	SUM	EXC	NET	SUM	EXC	NET
	(1)	(2)	(3)	(4)	(5)	(6)
Interstate - First 2 Years	5.18***	3.51***	2.06	6.07***	5.10***	2.15
	(1.88)	(1.24)	(1.73)	(2.16)	(1.77)	(1.51)
Interstate > 2 years	6.74***	2.33*	5.48	7.71**	2.54**	4.28
	(2.46)	(1.32)	(3.41)	(3.42)	(1.23)	(2.79)
	Panel C: Total Credit			Panel D: Long-term Credit		
	SUM	EXC	NET	SUM	EXC	NET
	(1)	(2)	(3)	(4)	(5)	(6)
Interstate - Initial Year	3.42*	2.28**	2.37	4.68*	4.61***	1.07
	(2.04)	(1.13)	(2.15)	(2.40)	(1.53)	(1.90)
Interstate - 1 Year	6.68**	4.81**	1.15	7.42**	5.47*	3.31
	(3.00)	(2.37)	(2.40)	(3.10)	(2.91)	(2.14)
Interstate - 2 Year	4.55	2.47*	3.00	3.42	2.50	2.37
	(2.83)	(1.32)	(3.43)	(2.76)	(1.58)	(2.79)
Interstate - 3 Year	4.82*	0.95	4.47	6.78**	1.83	2.99
	(2.65)	(1.36)	(3.50)	(3.37)	(1.61)	(3.10)
Interstate - 4 Year	12.82**	4.91**	8.40	14.91**	4.59**	8.95
	(4.88)	(2.30)	(6.66)	(5.83)	(1.97)	(6.63)
Interstate - 5 Year	9.89**	2.33	9.80*	12.84**	1.59	6.75
	(4.15)	(1.70)	(5.33)	(5.42)	(1.93)	(5.10)
Interstate > 5 Years	4.43	1.81	3.00	6.58	1.71	3.93
	(2.66)	(1.64)	(3.53)	(4.24)	(1.85)	(4.09)
Number of obervations	1416	1416	1416	1416	1416	1416

Table B.3 (not for publication)
Mechanisms and alternative explanations. Within Index

The table reports regression coefficients for the impact of deregulation on the Within Index estimated by two-limit Tobit. Robust standard errors clustered at the state level are in parentheses. All coefficients and standard errors are multiplied by 100 for an easier interpretation. The dependent variable in Panel A is the Within Index computed by separating firms in each state-year into two groups, entering or exiting firms and the rest. The dependent variable in Panel B is the within index computed by separating firms in each state-year by the median number of employees calculated across all firms in the year-state. The dependent variable in Panel C is the within index computed by separating firms in each state-year in quartiles by the number of employees calculated across all firms in the year across states. The dependent variable in Panel D is the Within Index computed by separating firms in each state-year by 1-digit SIC industry groups in columns (1), (2), (5) and (6), and by 2-digit SIC industry groups in columns (3), (4), (7) and (8). Where noted, labor shares represent shares the labor shares of mining, manufacturing, construction, transportation, trade, finance, services, and government in total non-farm employment. All regressions include state and year effects. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Total Credit				Long-term Credit			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Incumbents versus Entering or Exiting Firms							
Interstate	7.61**	7.56**	7.17**	6.91*	7.83**	8.53**	7.59**	8.15**
	(3.46)	(3.64)	(3.62)	(3.90)	(3.82)	(4.04)	(3.84)	(4.12)
Intrastate	-4.19	-5.77*			-2.26	-3.32		
	(3.35)	(3.64)			(3.29)	(3.30)		
Number of observations	1416	1416	1416	1416	1416	1416	1416	1416
Labor shares	yes	no	yes	no	yes	no	yes	no
	Panel B: Size by Median							
Interstate	-0.77	-0.58	-1.12	-1.09	0.44	0.45	0.29	0.27
	(2.23)	(2.23)	(2.22)	(2.22)	(3.36)	(3.78)	(3.34)	(3.76)
Intrastate	-3.39	-4.52**			-1.40	-1.57		
	(2.29)	(2.22)			(2.20)	(2.43)		
Number of observations	1410	1410	1410	1410	1410	1410	1410	1410
Labor shares	yes	no	yes	no	yes	no	yes	no
	Panel C: Size by Quartiles							
Interstate	1.94	2.54	1.55	2.10	-1.71	-1.52	-2.12	-1.84
	(2.17)	(2.07)	(2.29)	(2.19)	(2.34)	(2.51)	(2.43)	(2.57)
Intrastate	-3.45	-3.51			-3.54	-2.57		
	(2.27)	(2.30)			(2.36)	(2.45)		
Number of observations	1410	1410	1410	1410	1410	1410	1410	1410
Labor shares	yes	no	yes	no	yes	no	yes	no
	Panel D: Industry Groups							
Interstate	3.84*	3.67	-0.06	-0.16	3.51	3.34	0.09	0.03
	(2.22)	(2.25)	(0.81)	(0.83)	(2.30)	(2.31)	(0.59)	(0.61)
Intrastate	-1.58		-0.80		-1.42		-0.43	
	(1.61)		(0.72)		(1.55)		(0.65)	
Number of observations	1416	1416	1416	1416	1416	1416	1416	1416
Labor shares	no	no	no	no	no	no	no	no

Table B.4 (not for publication)
Profit-based firm volatility

The table reports regression coefficients for robustness tests controlling for changes in profit-based firm-level volatility. Robust standard errors clustered at the state level are in parentheses. All regressions include state and year effects and the labor shares of the various sectors in total non-farm employment. The dependent variables are total credit reallocation (SUM) in column (1), excess total credit reallocation (EXC) in column (2), net total credit change (NET) in column (3), long-term credit reallocation (SUM) in column (4), excess long-term credit reallocation (EXC) in column (5), and net long-term credit change (NET) in column (6). *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit			Panel B: Long-term Credit		
	SUM	EXC	NET	SUM	EXC	NET
	(1)	(2)	(3)	(4)	(5)	(6)
Interstate	4.48**	2.88**	1.91	5.04***	4.09***	1.88
	(1.76)	(1.12)	(1.69)	(1.79)	(1.28)	(1.35)
Firm (Profit) Volatility	5.79	0.01	-9.36	4.39	-0.40	-8.71
	(4.85)	(3.05)	(6.25)	(4.73)	(3.07)	(6.10)
Mining	-0.67	-0.68	1.99	-1.83	-1.86	0.94
	(2.79)	(1.42)	(4.86)	(2.96)	(1.74)	(4.36)
Manufacturing	-0.23	-1.21	1.92	-1.85	-2.95	1.03
	(2.80)	(1.54)	(5.04)	(3.02)	(1.77)	(4.49)
Construction	2.32	-0.17	4.95	0.80	-1.83	4.06
	(3.03)	(1.43)	(5.44)	(3.12)	(1.68)	(4.77)
Transportation	-0.95	-2.22	2.44	-2.33	-3.61*	2.25
	(3.32)	(1.81)	(5.05)	(3.73)	(2.02)	(4.56)
Trade	-0.56	-1.32	0.91	-2.06	-2.80	0.01
	(2.81)	(1.49)	(4.88)	(3.01)	(1.68)	(4.39)
Finance	-0.38	-1.71	2.58	-2.19	-3.23*	1.44
	(2.92)	(1.50)	(5.17)	(3.09)	(1.82)	(4.71)
Services	-0.38	-1.13	1.80	-2.01	-2.64	0.94
	(2.88)	(1.57)	(5.03)	(3.10)	(1.81)	(4.47)
Government	-0.66	-1.21	1.45	-2.12	-2.71	0.62
	(2.84)	(1.50)	(4.96)	(3.03)	(1.76)	(4.31)
Number of obervations	1367	1367	1367	1367	1367	1367
	Panel C: Total Credit			Panel D: Long-term Credit		
	SUM	EXC	NET	SUM	EXC	NET
	(1)	(2)	(3)	(4)	(5)	(6)
Interstate	4.36**	2.94**	1.88	4.91***	4.09***	1.91
	(1.73)	(1.10)	(1.66)	(1.72)	(1.25)	(1.35)
Intrastate	1.19	-0.60	0.34	1.31	0.05	-0.32
	(1.38)	(0.70)	(1.34)	(1.73)	(1.01)	(1.21)
Firm (Profit) Volatility	5.63	0.10	-9.41	4.21	-0.40	-8.67
	(4.76)	(3.01)	(6.23)	(4.71)	(3.05)	(6.13)
Labor shares	Yes	Yes	Yes	Yes	Yes	Yes
Number of obervations	1367	1367	1367	1367	1367	1367

Table B.5 (not for publication)
Firm heterogeneity (total credit)

The table reports regression coefficients for exercises that construct credit flows based on various dimensions of firm heterogeneity. Dimensions of firm heterogeneity are number of employees (Panels A and B), age (Panels C and D), the Rajan and Zingales (1998) index of external financial dependence (Panel E), and the Eurostat indicators on high-tech industry (Panel F). All panels report regressions using total credit flows. Robust standard errors clustered at the state level are in parentheses. All regressions include the labor shares of the various sectors in state non-farm employment, and state and year effects (coefficients and standard errors are not reported to conserve space). All coefficients and standard errors are multiplied by 100 to ease interpretation. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

Panel A	Size (employment)					
	Baseline			< 95th percentile		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	5.78***	3.06***	3.37	3.95**	2.28***	4.01*
	(1.86)	(1.12)	(2.05)	(1.81)	(0.79)	(2.27)
Number of observations	1,408	1,408	1,408	1,408	1,408	1,408
Panel B	Size (employment)					
	< 90th percentile			< 85th percentile		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	4.66**	2.75***	3.51	4.99***	2.87***	3.92*
	(1.80)	(0.84)	(2.13)	(1.83)	(0.83)	(2.19)
Number of observations	1,408	1,408	1,408	1,408	1,408	1,408
Panel C	Age					
	< 95th percentile			> 5th percentile		
	SUM (4)	EXC (5)	NET (6)	SUM (1)	EXC (2)	NET (3)
Interstate	2.34	2.62***	4.32*	5.00***	2.67**	2.43
	(3.46)	(0.96)	(2.17)	(1.60)	(1.15)	(1.54)
Number of observations	1,415	1,415	1,415	1,415	1,415	1,415
Panel D	Age					
	< 90th percentile			> 10th percentile		
	SUM (4)	EXC (5)	NET (6)	SUM (1)	EXC (2)	NET (3)
Interstate	3.40	2.69**	6.22***	4.74***	2.38**	2.29
	(2.84)	(1.02)	(2.21)	(1.58)	(1.12)	(1.50)
Number of observations	1,415	1,415	1,415	1,414	1,414	1,414
Panel E	External financial dependence					
	< median			> median		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	5.20	4.07**	4.93	4.50***	2.03***	1.70
	(8.87)	(1.58)	(6.22)	(1.60)	(0.74)	(2.21)
Number of observations	1,323	1,323	1,323	1,416	1,416	1,416
Panel F	Technology					
	< median			> median		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	3.08*	1.05	2.40	4.38	4.42**	15.32***
	(1.61)	(0.66)	(1.95)	(7.32)	(2.05)	(4.49)
Number of observations	1,393	1,393	1,393	1,348	1,348	1,348

Table B.6 (not for publication)
Firm heterogeneity (long-term credit)

The table reports regression coefficients for robustness tests that contruct credit flows based on various dimensions of firm heterogeneity. Dimensions of firm heterogeneity are number of employees (Panels A and B), age (Panels C and D), the Rajan and Zingales (1998) index of external financial dependence (Panel E), and the Eurostat indicators on high-tech industry (Panel F). All panels report regressions using long-term credit flows. Robust standard errors clustered at the state level are in parentheses. All regressions include the labor shares of the various sectors in state non-farm employment, and state and year effects (coefficients and standard errors are not reported to conserve space). All coefficients and standard errors are multiplied by 100 to ease interpretation. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

Panel A	Size (employment)					
	Baseline			< 95th percentile		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	6.70***	4.12***	2.97*	6.08***	3.40***	3.52*
	(2.12)	(1.26)	(1.68)	(2.09)	(0.91)	(2.03)
Number of observations	1,408	1,408	1,408	1,408	1,408	1,408
Panel B	Size (employment)					
	< 90th percentile			< 85th percentile		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	6.32***	2.92***	2.67	6.49***	2.87***	3.21
	(2.08)	(0.90)	(2.05)	(2.08)	(0.86)	(2.13)
Number of observations	1,408	1,408	1,408	1,408	1,408	1,408
Panel C	Age					
	< 95th percentile			> 5th percentile		
	SUM (4)	EXC (5)	NET (6)	SUM (1)	EXC (2)	NET (3)
Interstate	1.34	2.26**	3.42	5.38***	3.83***	2.67*
	(3.65)	(1.04)	(2.06)	(1.68)	(1.32)	(1.36)
Number of observations	1,415	1,415	1,415	1,415	1,415	1,415
Panel D	Age					
	< 90th percentile			> 10th percentile		
	SUM (4)	EXC (5)	NET (6)	SUM (1)	EXC (2)	NET (3)
Interstate	1.34	1.85	4.44**	5.23***	3.26**	1.98
	(2.86)	(1.20)	(2.06)	(1.65)	(1.26)	(1.41)
Number of observations	1,415	1,415	1,415	1,414	1,414	1,414
Panel E	External financial dependence					
	< median			> median		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	2.84	5.39***	0.34	5.50***	2.08***	1.44
	(7.46)	(1.63)	(8.05)	(2.02)	(0.65)	(1.98)
Number of observations	1,319	1,319	1,319	1,416	1,416	1,416
Panel F	Technology					
	< median			> median		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	5.13**	1.21**	2.20	0.44	3.24	15.01***
	(2.00)	(0.56)	(1.68)	(6.52)	(2.61)	(5.10)
Number of observations	1,393	1,393	1,393	1,347	1,347	1,347

Table B.7 (not for publication)
Credit reallocation and lending quality

The table reports regression coefficients for the impact of credit flows on lending quality. Robust standard errors clustered at the state level are in parentheses. All coefficients and standard errors are multiplied by 100 to ease interpretation. The regressions are estimated by ordinary least squares. The dependent variable is state-level asset-weighted nonperforming loan (NPL) ratio. The sample period is 1983-2001 due to bank data availability. Panel A reports regressions using total credit flows and panel B reports regressions using long-term credit flows. In columns (1) and (4) SUM is credit reallocation, in columns (2) and (5) EXC is excess credit reallocation, and in columns (3) and (6) NET is net credit change. The logs of state-level personal income, employment, and population are included as controls. Mining, manufacturing, construction, transportation, trade, finance, services, and government are the labor shares of the various sectors in total non-farm employment, in percent. All regressions include state and year effects. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit			Panel B: Long-term Credit		
	NPL Ratio			NPL Ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
SUM	-0.182**			-0.210**		
	[0.087]			[0.087]		
EXC		-0.391*			-0.403**	
		[0.209]			[0.174]	
NET			-0.220***			-0.137**
			[0.069]			[0.066]
Personal Income	3.428**	3.437**	3.524**	-0.080	3.433**	3.417**
	[1.422]	[1.392]	[1.387]	[1.577]	[1.409]	[1.409]
Employment	-2.250	-2.344	-2.313	-2.264	-2.328	-2.340
	[2.240]	[2.199]	[2.227]	[2.240]	[2.183]	[2.225]
Population	-1.093	-1.051	-1.163	-0.023	-0.021	-0.021
	[2.441]	[2.417]	[2.423]	[0.031]	[0.031]	[0.031]
Mining	-0.363	-0.323	-0.349	-0.365	-0.325	-0.354
	[0.392]	[0.381]	[0.383]	[0.382]	[0.379]	[0.386]
Manufacturing	-0.601	-0.565	-0.578	-0.663*	-0.565	-0.589
	[0.398]	[0.387]	[0.387]	[0.392]	[0.384]	[0.391]
Construction	-0.754**	-0.718*	-0.733**	-0.822**	-0.717**	-0.741**
	[0.369]	[0.358]	[0.358]	[0.365]	[0.356]	[0.362]
Transportation	-0.749*	-0.714*	-0.731*	-0.670*	-0.712*	-0.733*
	[0.394]	[0.377]	[0.382]	[0.388]	[0.374]	[0.384]
Trade	-0.496	-0.456	-0.473	-0.576	-0.460	-0.479
	[0.418]	[0.405]	[0.405]	[0.408]	[0.403]	[0.408]
Finance	-0.236	-0.205	-0.208	-0.256	-0.202	-0.221
	[0.395]	[0.385]	[0.385]	[0.397]	[0.383]	[0.389]
Services	-0.562	-0.525	-0.539	-0.496	-0.524	-0.549
	[0.390]	[0.379]	[0.380]	[0.387]	[0.377]	[0.383]
Government	-0.508	-0.475	-0.487	-0.411	-0.476	-0.495
	[0.413]	[0.405]	[0.405]	[0.396]	[0.402]	[0.409]
Number of observations	957	957	957	957	957	957

Table B.8 (not for publication)
DiD Diagnostic. Estimates and Weights by Comparison Groups
The table presents the Goodman-Bacon (2021) decomposition for our baseline estimates in Panel (A) of Table 2. The decomposition gives the average DiD estimate and summed weight for all "earlier vs later comparisons" and all "later vs earlier comparisons". The dependent variables are gross credit reallocation (SUM) in Panel (A), excess credit reallocation (EXC) in Panel (B), and net credit growth (NET) in Panel (C).

Panel A: SUM (Total Credit)		
	Average DiD Estimate	Weight
Earlier Treated vs Later Control	6.0	0.658
Later Treated vs Earlier Control	5.1	0.342
Panel B: EXC (Total Credit)		
	Average DiD Estimate	Weight
Earlier Treated vs Later Control	3.7	0.658
Later Treated vs Earlier Control	2.6	0.342
Panel A: NET (Total Credit)		
	Average DiD Estimate	Weight
Earlier Treated vs Later Control	3.0	0.658
Later Treated vs Earlier Control	3.0	0.342

Table B.9 (not for publication)
Robustness. Alternative DiD Estimator
The table reports regression coefficients for the impact of deregulation on credit flows within states using the alternative differences-in-differences estimator from Sun and Abraham (2021). Robust standard errors clustered at the state level are in parentheses. All regressions include state and year effects. The dependent variables are total credit reallocation (SUM) in column (1), excess total credit reallocation (EXC) in column (2), and net total credit change (NET) in column (3). *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	SUM (1)	EXC (2)	NET (3)
Interstate	6.56***	3.33***	4.18*
	(1.79)	(1.02)	(2.12)
Number of Observations	1416	1416	1416

Table B.10 (not for publication)
Robustness tests. Credit market deregulation and credit reallocation
The table reports regression coefficients for robustness tests that exclude Alaska (Panel A), exclude the five states with the smallest number of firms (Alaska, Montana, North Dakota, South Dakota, and Wyoming - Panel B), and control for unit-banking states (Panel C). Robust standard errors clustered at the state level are in parentheses. All regressions include the labor shares of the various sectors in state non-farm employment, and state and year effects (coefficients and standard errors are not reported to conserve space). All coefficients and standard errors are multiplied by 100 to ease interpretation. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Dropping Alaska					
	Total Credit			Long-term Credit		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	4.86***	3.14***	1.93	5.15***	4.24***	1.77
	(1.70)	(1.16)	(1.60)	(1.68)	(1.28)	(1.29)
Number of observations	1392	1392	1392	1392	1392	1392
	Panel B: Dropping Five Smallest States					
	Total Credit			Long-term Credit		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	4.33**	2.84**	1.19	4.90**	4.30***	1.18
	(1.96)	(1.26)	(1.75)	(1.98)	(1.43)	(1.44)
Number of observations	1305	1305	1305	1305	1305	1305
	Panel C: Controlling for Unit-Banking States					
	Total Credit			Long-term Credit		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	3.96**	2.28*	3.36	5.60**	3.32**	3.08
	(2.00)	(1.27)	(2.85)	(2.43)	(1.38)	(2.41)
Number of observations	1416	1416	1416	1416	1416	1416

Table B.11 (not for publication)
Credit market deregulation and credit change persistence
The table reports regression coefficients for the impact of deregulation on credit flow changes within states. Robust standard errors clustered at the state level are in parentheses. All coefficients and standard errors are multiplied by 100 for an easier interpretation. The dependent variables are total credit change persistence (PERSTOCR) in columns (1) and (2), and long-term credit change persistence (PERSLTCR) in columns (3) and (4). Panel (A) refers to total credit and Panel (B) to long-term credit. Interstate (Intrastate) is an indicator variable taking the value of one starting on the year a state allowed interstate branching or banking (intrastate branching), zero otherwise. Mining, manufacturing, construction, transportation, trade, finance, services, and government are the labor shares of the various sectors in total non-farm employment, in percent. All regressions include state and year effects. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit		Panel B: Longt-Term Credit	
	PERSTOCR	PERSTOCR	PERSLTCR	PERSLTCR
	(1)	(2)	(3)	(4)
Interstate	1.61	1.59	1.32	1.22
	(1.44)	(1.39)	(1.00)	(1.01)
Intrastate	-0.24		-0.89	
	(0.97)		(1.06)	
Mining	-1.54	-1.55	2.78	2.77
	(3.50)	(3.50)	(4.00)	(4.05)
Manufacturing	-2.98	-3.00	2.11	2.02
	(3.39)	(3.39)	(3.92)	(3.97)
Construction	-2.97	-3.00	2.61	2.52
	(3.22)	(3.22)	(4.02)	(4.06)
Transportation	-5.32	-5.35	3.81	3.67
	(3.29)	(3.30)	(3.98)	(4.02)
Trade	-2.19	-2.22	0.96	0.87
	(3.54)	(3.54)	(3.84)	(3.90)
Finance	-2.47	-2.48	1.31	1.28
	(3.34)	(3.33)	(3.25)	(3.29)
Services	-3.09	-3.12	2.23	2.14
	(3.36)	(3.35)	(3.96)	(4.02)
Government	-2.61	-2.64	2.03	1.91
	(3.23)	(3.22)	(3.78)	(3.83)
Number of observations	1415	1415	1415	1415

Table B.12 (not for publication)
Mechanisms and alternative explanations. Excluding labor shares
The table reports regression coefficients for the impact of deregulation on credit flows within states after accounting for intensive margin effects (Panel A) or changes in firm volatility (Panel B). Robust standard errors clustered at the state level are in parentheses. All regressions include state and year effects. Labor shares of the various sectors are not included in these robustness regressions. The dependent variables are total credit reallocation (SUM) in column (1), excess total credit reallocation (EXC) in column (2), net total credit change (NET) in column (3), long-term credit reallocation (SUM) in column (4), excess long-term credit reallocation (EXC) in column (5), and net long-term credit change (NET) in column (6). In Panel A all the flows are constructed using only credit changes of continuing firms. In Panel B firm volatility is the debt-weighted average volatility of firm sales in a state. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

Panel A	Intensive Margin (Total Credit)			Intensive Margin (Long-term Credit)		
	SUMint (1)	EXCint (2)	NETint (3)	SUMint (4)	EXCint (5)	NETint (6)
Interstate	6.08***	2.99***	3.48**	7.20***	4.42***	4.01**
	(1.60)	(1.04)	(1.72)	(1.93)	(1.29)	(1.81)
Number of observations	1415	1415	1415	1415	1415	1415
Panel B	Firm Volatility (Total Credit)			Firm Volatility (Long-term Credit)		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	5.73***	3.31***	2.98*	6.33***	4.48***	2.86**
	(1.78)	(1.11)	(1.65)	(1.86)	(1.34)	(1.36)
Firm Volatility	-7.10	9.19***	-27.34***	0.74	6.54*	-20.63**
	(8.37)	(2.97)	(8.97)	(7.45)	(3.57)	(8.77)
Number of observations	1385	1385	1385	1385	1385	1385

Table B.13 (not for publication)
Non-linearities. Excluding labor shares

The table reports regression coefficients for the impact of deregulation on credit flows within states after accounting for possible non-linearities due to large credit changes (Panel A) or recessions (Panel B). Panel C reports regression coefficients of the second stage for the impact of large credit flows on the growth of state total factor productivity. Robust standard errors clustered at the state level are in parentheses. All regressions include state and year effects. Labor shares of the various sectors are not included in these robustness regressions. The dependent variables in Panels A and B are total credit reallocation (SUM) in column (1), excess total credit reallocation (EXC) in column (2), net total credit change (NET) in column (3), long-term credit reallocation (SUM) in column (4), excess long-term credit reallocation (EXC) in column (5), and net long-term credit change (NET) in column (6). In Panel A all these flows are constructed using large credit changes. Large credit change is defined at the firm level as credit creation or destruction of at least 18% in absolute value. In Panel B, recession is a dummy that takes the value of one for the six NBER recessions that occurred during the sample period, zero otherwise. In Panel C columns (1)-(3) report regressions using total credit flows and and columns (4)-(6) report regressions using long-term credit flows. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

Panel A	Large Credit Flows (Total Credit)			Large Credit Flows (Long-term Credit)		
	SUMbig (1)	EXCbig (2)	NETbig (3)	SUMbig (4)	EXCbig (5)	NETbig (6)
Interstate	7.23***	3.40***	4.17**	7.90***	4.37***	3.81**
	(2.04)	(1.04)	(1.85)	(2.42)	(1.35)	(1.63)
Number of observations	1416	1416	1416	1416	1416	1416
Panel B	Recessions (Total Credit)			Recessions (Long-term Credit)		
	SUM (1)	EXC (2)	NET (3)	SUM (4)	EXC (5)	NET (6)
Interstate	6.93***	3.45***	5.15**	8.48***	4.71***	5.19**
	(2.15)	(1.11)	(2.21)	(2.61)	(1.44)	(2.05)
Interstate x Recession	-3.98	-1.95	-6.31*	-5.68	-2.59	-8.60*
	(2.91)	(1.74)	(3.72)	(3.63)	(2.09)	(4.37)
Recession	-1.84	-6.16**	12.32**	-4.16	4.31**	9.69*
	(3.91)	(1.97)	(4.72)	(3.94)	(2.07)	(4.92)
Number of observations	1416	1416	1416	1416	1416	1416
Panel C	Large Flows (Total Credit)			Large Flows (Long-term Credit)		
	Productivity Growth			Productivity Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
SUMbig/EXCbig/NETbig	0.10*	0.22*	0.19	0.09*	0.17*	0.19
	(0.05)	(0.12)	(0.14)	(0.05)	(0.09)	(0.14)
Number of observations	990	990	990	990	990	990

Table B.14 (not for publication)
Credit market deregulation and credit reallocation. Controlling for state-level economic conditions
The table reports regression coefficients for the impact of deregulation on credit flows within states. Robust standard errors clustered at the state level are in parentheses. All coefficients and standard errors are multiplied by 100 to ease interpretation. The regressions are estimated by ordinary least squares. The dependent variables are gross credit reallocation (SUM) in columns (1), (2), (7) and (8), excess credit reallocation (EXC) in columns (3), (4), (9) and (10), and net credit growth (NET) in columns (5), (6), (11) and (12). Panels A and C refer to total credit, Panels B and D to long-term credit. Interstate is an indicator variable taking the value of one starting on the year a state allowed interstate banking, zero otherwise. The logs of state-level personal income, employment, and population are included as controls in Panels A and B. The same three variables, along with state-specific time trends, are included as controls in Panels C and D. All regressions include state and year effects. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit						Panel B: Long-term Credit					
	SUM (1)	SUM (2)	EXC (3)	EXC (4)	NET (5)	NET (6)	SUM (7)	SUM (8)	EXC (9)	EXC (10)	NET (11)	NET (12)
Interstate	5.29***	5.05***	2.64**	2.65**	3.25	3.56	6.68***	5.76***	3.89***	3.68***	2.88	2.97
	(1.83)	(1.76)	(1.04)	(1.07)	(2.37)	(2.26)	(2.30)	(2.10)	(1.22)	(1.19)	(2.11)	(1.92)
Personal Income	0.15**	0.24**	0.11*	0.09	0.01	-0.23	0.16	0.36**	0.18**	0.18***	0.01	-0.25
	(0.70)	(0.12)	(0.06)	(0.06)	(0.18)	(0.23)	(0.13)	(0.15)	(0.07)	(0.06)	(0.21)	(0.24)
Employment	0.37**	0.29	0.15*	0.17*	0.47**	0.08	0.32**	0.34	0.06	0.13	0.50**	0.19
	(0.14)	(0.18)	(0.08)	(0.09)	(0.18)	(0.19)	(0.15)	(0.22)	(0.07)	(0.09)	(0.20)	(0.23)
Population	-0.42***	-0.47**	-0.21***	-0.17**	-0.42	0.04	-0.40*	-0.62**	-0.21***	-0.24***	-0.45	-0.01
	(0.13)	(0.21)	(0.07)	(0.08)	(0.32)	(0.37)	(0.21)	(0.27)	(0.08)	(0.09)	(0.37)	(0.41)
Labor shares	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	1416	1416	1416	1416	1416	1416	1416	1416	1416	1416	1416	1416
	Panel C: Total Credit						Panel D: Long-term Credit					
	SUM (1)	SUM (2)	EXC (3)	EXC (4)	NET (5)	NET (6)	SUM (7)	SUM (8)	EXC (9)	EXC (10)	NET (11)	NET (12)
Interstate	4.82**	4.47**	2.46**	2.48**	3.00	2.55	6.05**	5.09**	3.52**	3.55**	2.56	1.85
	(2.14)	(2.05)	(1.21)	(1.16)	(2.24)	(2.11)	(2.64)	(2.31)	(1.42)	(1.36)	(2.04)	(1.81)
Intrastate	1.45	1.35	-0.87	-0.43	0.61	0.03	1.79	0.92	-0.31	-0.16	-0.10	-0.99
	(1.96)	(2.04)	(0.82)	(0.83)	(1.85)	(1.98)	2.39)	(2.45)	(1.16)	(1.16)	(1.74)	(1.88)
Personal Income	0.39**	0.46*	0.09	0.09	0.09	-0.24	0.38	0.60	0.16	0.19*	0.04	-0.32
	(0.16)	(0.26)	(0.07)	(0.08)	(0.40)	(0.38)	(0.23)	(0.37)	(0.12)	(0.11)	(0.39)	(0.38)
Employment	0.32	0.35	0.21*	0.23	0.72***	0.14	0.24	0.39	0.10	0.18	0.76***	0.22
	(0.21)	(0.23)	(0.11)	(0.14)	(0.23)	(0.29)	(0.22)	(0.24)	(0.10)	(0.12)	(0.26)	(0.33)
Population	-1.02***	-1.20***	-0.30**	-0.47**	-0.69	-0.14	-1.19	-1.19*	-0.37**	-0.51**	-0.70	-0.17
	(0.34)	(0.42)	(0.14)	(0.20)	(1.03)	(1.20)	(0.92)	(0.63)	(0.17)	(0.20)	(1.00)	(1.15)
Labor shares	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
State-specific time trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1416	1416	1416	1416	1416	1416	1416	1416	1416	1416	1416	1416

Table B.15 (not for publication)
Credit market deregulation and credit reallocation. Controlling for state-level political factors and fiscal position

The table reports regression coefficients for the impact of deregulation on credit flows within states, while controlling for political economy variables in Panels A and B, and controlling for indicators of state fiscal stance in Panels C and D. All controls are included with one lag. Robust standard errors clustered at the state level are in parentheses. All coefficients and standard errors are multiplied by 100 to ease interpretation. The regressions are estimated by ordinary least squares. The dependent variables are gross credit reallocation (SUM) in columns (1), (2), (7) and (8), excess credit reallocation (EXC) in columns (3), (4), (9) and (10), and net credit growth (NET) in columns (5), (6), (11) and (12). Panels A and C refer to total credit, Panels B and D to long-term credit. Interstate (Intrastate) is an indicator variable taking the value of one starting on the year a state allowed interstate banking (intrastate branching), zero otherwise. Panels A and B include Interstate but not Intrastate; Panels C and D include both Interstate and Intrastate. Mining, manufacturing, construction, transportation, trade, finance, services, and government are the labor shares of the various sectors in total non-farm employment, in percent. All regressions include state and year effects. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit						Panel B: Long-term Credit					
	SUM (1)	SUM (2)	EXC (3)	EXC (4)	NET (5)	NET (6)	SUM (7)	SUM (8)	EXC (9)	EXC (10)	NET (11)	NET (12)
Interstate	6.01***	5.22***	3.02**	2.99**	4.16*	2.80	7.26***	6.11***	4.20***	4.20***	3.79*	2.17
	(2.11)	(1.92)	(1.23)	(1.16)	(2.37)	(1.92)	(2.50)	(2.21)	(1.51)	(1.39)	(2.05)	(1.55)
Small Bank Share	33.55	23.06	9.22	14.20	-6.24	41.34	87.75	82.89	9.32	2.40	48.03	100.76
	(42.64)	(31.58)	(15.58)	(14.96)	(66.06)	(54.37)	(65.28)	(52.82)	(12.55)	(11.63)	(59.56)	(61.51)
Small Bank Health	9.80	-15.06	31.47	33.15	41.76	48.62	97.26	74.35	28.97	26.03	94.14**	111.79**
	(40.08)	(36.77)	(25.18)	(22.04)	(51.31)	(38.82)	(76.15)	(58.50)	(23.14)	(20.67)	(46.02)	(44.30)
Labor shares	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
	Panel C: Total Credit						Panel D: Long-term Credit					
	SUM (1)	SUM (2)	EXC (3)	EXC (4)	NET (5)	NET (6)	SUM (7)	SUM (8)	EXC (9)	EXC (10)	NET (11)	NET (12)
Interstate	6.74***	6.08***	3.39***	3.33***	4.12*	3.33	8.07***	6.97***	4.42***	4.21***	3.70*	2.86
	(1.88)	(1.83)	(1.09)	(1.11)	(2.25)	(2.13)	(2.32)	(2.11)	(1.35)	(1.28)	(2.02)	(1.80)
Highway Expenses	1.32*	1.04*	0.54	0.43	1.05*	0.57	0.91	0.72	0.43	0.36	0.79	0.40
	(0.67)	(0.54)	(0.51)	(0.45)	(0.60)	(0.72)	(0.66)	(0.57)	(0.28)	(0.29)	(0.60)	(0.75)
Tax Receipts-to-Income	199.74	182.44	-14.95	-23.58	-68.02	-66.60	237.84	172.95	-28.96	-37.07	-233.91*	-293.80**
	(162.83)	(167.56)	(17.14)	(25.06)	(145.64)	(171.55)	(302.63)	(276.67)	(21.25)	(22.27)	(117.27)	(140.64)
Labor shares	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	1387	1387	1387	1387	1387	1387	1387	1387	1387	1387	1387	1387

Table B.16 (not for publication)
Credit reallocation and total factor productivity, with highway expenditures (second stage results)
The table reports regression coefficients for the impact of credit flows on the growth of state total factor productivity. Robust standard errors clustered at the state level are in parentheses. Coefficients and standard errors for the highway expenditures and labor share variables are multiplied by 100 to ease interpretation. The regressions are estimated by two-stage least squares to control for the endogeneity of credit flows. The dependent variable is the log difference of state total factor productivity. Panel A reports regressions using total credit flows, Panel B reports regressions using long-term credit flows. Panels C and D report regressions using total and long-term credit flows due to large credit changes. In columns (1) and (4) SUM is gross credit reallocation, in columns (2) and (5) EXC is excess credit reallocation, in columns (3) and (6) NET is net credit growth. In columns (7) and (10) SUMbig is gross credit reallocation due to large credit changes, in columns (8) and (11) EXCbig is excess credit reallocation due to large credit changes, in columns (9) and (12) NETbig is net credit growth due to large credit changes. Highexp is the log difference of state real highway expenditures. All regressions include state and year effects. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit			Panel B: Long-term Credit			Panel C: Total (Large Flows)			Panel D: Long-term (Large Flows)		
	Productivity growth			Productivity growth			Productivity growth			Productivity growth		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SUM / SUMbig	0.17**			0.14**			0.14**			0.14**		
	(0.09)			(0.06)			(0.06)			(0.06)		
EXC / EXCbig		0.30**			0.21**			0.27**			0.21**	
		(0.14)			(0.09)			(0.12)			(0.09)	
NET / NETbig			0.31			0.40			0.32			0.37
			(0.22)			(0.30)			(0.21)			(0.26)
Highexp	-0.69	-0.67	-1.53	-1.15	-0.74	-1.30	-0.81	-0.62	-1.60	-1.33	-0.82	-1.28
	(1.03)	(0.79)	(2.62)	(1.04)	(0.67)	(2.88)	(1.03)	(0.70)	(2.66)	(1.07)	(0.69)	(2.62)
Mining	4.33*	1.58	3.85	5.01*	2.29*	7.10	4.22*	2.23	3.79	4.97*	2.31	6.83
	(2.59)	(1.56)	(2.99)	(2.77)	(1.37)	(5.79)	(2.47)	(1.50)	(2.90)	(2.69)	(1.44)	(5.41)
Manufacturing	4.37	1.94	3.93	5.11*	2.49*	7.60	4.22	2.46	4.01	4.99*	2.45	7.42
	(2.77)	(1.65)	(3.42)	(3.02)	(1.50)	(6.42)	(2.65)	(1.63)	(3.32)	(2.92)	(1.58)	(6.05)
Construction	4.16	1.90	3.84	4.92*	2.51	7.11	3.99	2.29	4.15	4.75*	2.41	7.34
	(2.63)	(1.68)	(3.59)	(2.95)	(1.54)	(6.37)	(2.54)	(1.66)	(3.46)	(2.85)	(1.64)	(6.10)
Transportation	4.92	2.69	5.03	5.80	2.94	8.69	4.65	3.19	5.13	5.64	2.89	8.49
	(3.11)	(1.91)	(4.63)	(3.66)	(1.79)	(8.02)	(2.99)	(1.90)	(4.49)	(3.57)	(1.88)	(7.45)
Trade	4.17	1.62	3.25	4.82*	2.16*	6.58	4.06	2.30	3.06	4.72*	2.26*	6.22
	(2.66)	(1.43)	(2.49)	(2.80)	(1.24)	(5.19)	(2.52)	(1.41)	(2.44)	(2.71)	(1.31)	(4.86)
Finance	4.58	2.41	4.34	5.32*	2.85*	8.39	4.48	2.86	4.55	5.21*	2.78	8.22
	(2.85)	(1.73)	(4.02)	(3.13)	(1.67)	(7.25)	(2.76)	(1.74)	(3.91)	(3.03)	(1.76)	(6.85)
Services	4.50	1.92	4.23	5.14*	2.42	7.80	4.34	2.47	4.24	5.01*	2.41	7.59
	(2.77)	(1.63)	(3.31)	(2.97)	(1.48)	(6.38)	(2.65)	(1.61)	(3.21)	(2.87)	(1.56)	(6.00)
Government	4.22	1.79	4.63	5.00*	2.30	8.39	4.07	2.29	4.60	4.90*	2.30	8.05
	(2.74)	(1.69)	(3.65)	(3.00)	(1.57)	(6.93)	(2.63)	(1.67)	(3.52)	(2.91)	(1.65)	(6.49)
Number of observations	990	990	990	990	990	990	990	990	990	990	990	990

Table B.17 (not for publication)
Credit market deregulation and credit reallocation. Controlling for lagged dependent variable

The table reports regression coefficients for the impact of deregulation on credit flows within states, while controlling for one lag of the dependent variable. Robust standard errors clustered at the state level are in parentheses. All coefficients and standard errors are multiplied by 100 to ease interpretation. The regressions are estimated by ordinary least squares. The dependent variables are gross credit reallocation (SUM) in columns (1), (2), (7) and (8), excess credit reallocation (EXC) in columns (3), (4), (9) and (10), and net credit growth (NET) in columns (5), (6), (11) and (12). Panels A and C refer to total credit, Panels B and D to long-term credit. Interstate (Intrastate) is an indicator variable taking the value of one starting on the year a state allowed interstate banking (intrastate branching), zero otherwise. Panels A and B include Interstate but not Intrastate; Panels C and D include both Interstate and Intrastate. Mining, manufacturing, construction, transportation, trade, finance, services, and government are the labor shares of the various sectors in total non-farm employment, in percent. All regressions include state and year effects. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

	Panel A: Total Credit						Panel B: Long-term Credit					
	SUM (1)	SUM (2)	EXC (3)	EXC (4)	NET (5)	NET (6)	SUM (7)	SUM (8)	EXC (9)	EXC (10)	NET (11)	NET (12)
Interstate	5.30***	5.09***	3.08***	3.03***	2.83*	2.37	5.26***	4.88***	4.11***	3.95***	2.99*	2.28
	(1.75)	(1.67)	(1.08)	(1.12)	(1.58)	(1.63)	(1.59)	(1.59)	(1.28)	(1.24)	(1.58)	(1.64)
SUM(t-1) / EXC(t-1) / NET(t-1)	2.15	0.84	5.43	3.08	8.24***	5.50**	24.75***	23.76***	7.65*	6.25	-11.17*	-14.25**
	(2.55)	(2.68)	(3.80)	(3.55)	(2.44)	(2.45)	(7.26)	(7.13)	(4.07)	(3.78)	(6.00)	(6.13)
Labor shares	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	1415	1415	1415	1415	1415	1415	1415	1415	1415	1415	1415	1415
	Panel C: Total Credit						Panel D: Long-term Credit					
	SUM (1)	SUM (2)	EXC (3)	EXC (4)	NET (5)	NET (6)	SUM (7)	SUM (8)	EXC (9)	EXC (10)	NET (11)	NET (12)
Interstate	5.26***	4.98***	3.17***	3.05***	3.00*	2.47	5.24***	4.83***	4.13***	3.94***	3.23*	2.43
	-1.73	(1.64)	(1.05)	(1.10)	(1.64)	(1.67)	(1.55)	(1.53)	(1.25)	(1.21)	(1.69)	(1.69)
Intrastate	0.32	1.08	-0.79	-0.21	-1.50	1.02	0.18	0.57	-0.22	0.13	-2.26	-1.49
	(1.26)	(1.33)	(0.65)	(0.71)	(1.43)	(1.88)	(1.26)	(1.60)	(0.80)	(0.88)	(1.57)	(1.97)
SUM(t-1) / EXC(t-1) / NET(t-1)	2.15	0.78	5.27	3.07	8.22***	5.54**	24.76***	23.75***	7.64*	6.25	-11.22*	-14.23**
	(2.55)	(2.65)	(3.73)	(3.53)	(2.44)	(2.47)	(7.27)	(7.14)	(4.09)	(3.78)	(6.03)	(6.15)
Labor shares	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	1415	1415	1415	1415	1415	1415	1415	1415	1415	1415	1415	1415

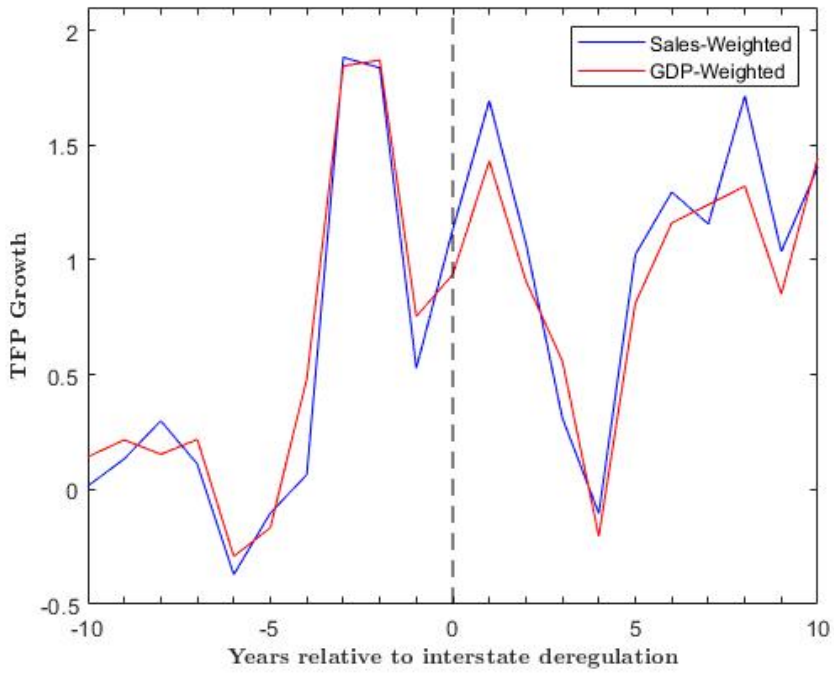

Figure B.1: This figure plots national measures of TFP growth relative to the time of interstate deregulation. The measures are weighted averages of state-level TFP growth, with sales share (blue) and GDP share (red) used as weights.

Online Appendix C: Large Credit Flows and Persistence

One can suspect that the increase in credit reallocation across continuing firms after liberalization reflects small credit adjustments due to day-to-day firm financing shortfalls. By contrast, if this increase reflects enhanced fluidity in the reallocation of funds across medium- and long-term investment opportunities, we should detect a key role of large credit changes. In fact, recent studies (e.g., Eisfeldt and Muir, 2013; Bazdresch, 2013), suggest that non-convex adjustment costs prompt investing businesses to make lumpy debt adjustments rather than frequent small ones.[1]

To understand to what extent large credit changes drive the baseline results, we partition firms into those with a debt growth rate g_{ft} above 18%, those with g_{ft} below -18%, and those with $-18\% <= g_{ft} <= 18\%$. The choice of the threshold growth rates is somewhat arbitrary so we select them following the analysis on large capital changes by Gourio and Kashyap (2007).[2] After allocating firms to these three groups, we sum credit growth rates in each group and for each state we compute the annual credit creation rate due to large credit increases ($POSbig_{it}$) and the annual credit destruction rate due to large credit decreases ($NEGbig_{it}$). We then calculate the gross and excess credit reallocation due to large credit changes as $SUMbig_{it} = POSbig_{it} + NEGbig_{it}$ and $EXCbig_{it} = SUMbig_{it} - |NETbig_{it}|$, where $NETbig_{it} = POSbig_{it} - NEGbig_{it}$. Table 3, Panel C, reports regressions that use these modified credit flows. The inferences we draw are unaltered: interstate lib-

[1] See also Minetti (2007) for a model rationalizing non-convex adjustment costs in credit changes.

[2] Gourio and Kashyap (2007) study large changes in physical capital (investment spikes) and set a threshold of 20% for the percentage change of physical capital. Following their approach, we choose $|g_{ft}| = 18\%$ (which corresponds to a canonical growth rate of 20%).

eralization boosts gross and excess credit reallocation, while leaving credit growth materially unchanged. Notably, we observe a slightly more pronounced impact of interstate deregulation on the gross reallocation due to large credit changes.

We also tested whether the debt changes underlying the credit flows became less persistent after the liberalization. We computed the average degree of persistence of firm debt changes, where persistence is measured by

$$\mathbf{P}_{ft} = \min\Big[1, \max\left(0, \frac{g_{ft,t+2}}{g_{ft,t+1}}\right).\Big] \tag{1}$$

In (1) $g_{ft,t+2}$ and $g_{ft,t+1}$ are the debt growth rate of a firm f between year t and year $t+2$ and the debt growth rate between year t and year $t+1$, respectively. $P_{ft} = 1$ occurs when all the debt change of the firm from t to $t+1$ lasts until $t+2$; $P_{ft} = 0$ means instead that the debt change is purely temporary. As reported in Table A.5, we found no effect of the indicators of credit market deregulation on the average persistence of debt changes.

Online Appendix D: Trade Credit

As mentioned in the main text, by affecting the dynamic process of reallocation of bank credit, the deregulation may have also influenced the inter-firm flows of other types of credit. An interesting question regards the dynamics of trade credit. Thus, we recompute the credit flows in (1)-(2) including trade credit and re-estimate our baseline model in (3) as well as the model in (6)-(7) using these modified (combined) credit flows. In carrying out the construction of the modified credit flows, we consider net trade credit (accounts payable minus accounts receivable) in order to capture the net debt exposure of a firm towards other firms.

As Tables D.1 and D.2 illustrate, our results are fully robust to the inclusion of trade credit in the credit flows. The estimates in column 2 of Panel B of Table D.1 suggest that a state that allowed entry by out-of-state banks would have experienced a 6 percentage points larger annual gross reallocation of total credit (SUM). This effect is very slightly larger than the effect of interstate liberalization on gross credit reallocation obtained in the baseline estimates (compare Panel B with Panel A). However, when evaluated relative to the mean gross credit reallocation in the sample, the effect of liberalization on gross credit reallocation is actually marginally smaller than in the baseline estimates (by little more than 1%).[3] The effect of liberalization on excess credit reallocation (EXC) provides further insights. First of all, once trade credit is accounted for, we observe a slightly smaller effect of interstate liberalization on excess credit reallocation (compare column 4 of Panel B with column 4 of Panel

[3]When including trade credit, the mean gross credit reallocation in the sample exceeds 19.5%.

A in Table D.1).[4] Moreover, when evaluated relative to the mean excess credit reallocation in the sample, the effect on excess credit reallocation is almost 2% smaller than in the baseline estimates.[5]

In conclusion, the results appear to be fully robust to the inclusion of trade credit and overall suggest a very slightly smaller quantitative effect on credit reallocation relative to the mean reallocation rate in the sample. An interesting interpretation could be that prior to the deregulation, the inter-firm flows of trade credit helped to mitigate the obstacles to the dynamic process of bank credit reallocation (i.e., firms were effectively acting as intermediaries of liquidity, somewhat alleviating the allocative frictions associated with the structure and functioning of the regulated banking sector). After the deregulation, this alleviating effect of trade credit became somewhat less relevant, thus implying a slightly smaller effect of the deregulation on the combined credit flows.

The estimates in Table D.2 also show the robustness of the TFP results when trade credit is accounted for. If anything, we observe a slightly stronger impact of the modified (combined) gross and excess credit reallocation measures on TFP growth in the states.

[4] We detect a marginally stronger effect on net credit growth (NET) when including trade credit. Thus, part of the effect on the combined gross credit reallocation flows (SUM) is driven by the accommodation of a slight acceleration in the growth of total (bank and trade) credit.

[5] When including trade credit, the mean excess credit reallocation in the sample equals 8.52%.

Table D.1 (not for publication)
Deregulation and credit reallocation. Including trade credit

The table reports regression coefficients for robustness tests that construct credit flows including trade credit. Panel A reproduces the baseline results from Table 2 in the main paper. Panel B shows results for credit flows constructed from long-term debt, short-term debt, and trade credit combined. Robust standard errors are in parentheses. All regressions include state and year effects. The even numbered columns include labor shares of the various sectors in state non-farm employment as controls (coefficients and standard errors are not reported to conserve space). All coefficients and standard errors are multiplied by 100 to ease interpretation. *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

Panel A	Baseline credit flows					
	SUM	SUM	EXC	EXC	NET	NET
	(1)	(2)	(3)	(4)	(5)	(6)
Interstate	6.36***	5.78***	3.17***	3.06***	4.25*	3.37
	(1.91)	(1.86)	(1.10)	(1.12)	(2.13)	(2.05)
Labor Shares	No	Yes	No	Yes	No	Yes
Number of observations	1,416	1,416	1,416	1,416	1,416	1,416
Panel B	Combined (baseline + trade credit) flows					
	SUM	SUM	EXC	EXC	NET	NET
	(1)	(2)	(3)	(4)	(5)	(6)
Interstate	6.43***	6.02***	2.83**	2.79**	5.22**	4.45*
	(2.20)	(2.09)	(1.15)	(1.12)	(2.51)	(2.27)
Labor Shares	No	Yes	No	Yes	No	Yes
Number of observations	1,406	1,406	1,406	1,406	1,406	1,406

Table D.2 (not for publication)
Credit reallocation and productivity. With trade credit

The table reports regression coefficients of the second stage for the impact of credit flows on the growth of state total factor productivity. Robust standard errors clustered at the state level are in parentheses. The regressions are estimated by two-stage least squares to control for the endogeneity of credit flows. The dependent variable is the log difference of state total factor productivity. Panel A reports regressions using total (baseline) credit flows and Panel B reports regressions using flows constructed from long-term debt, short-term debt, and trade credit combined. All regressions include state and year effects. The even numbered columns include labor shares of the various sectors in state non-farm employment as controls (coefficients and standard errors are not reported to conserve space). *, **, and *** denote statistical significance at the 10, 5 and 1% level, respectively.

Panel A	Baseline credit flows					
	Productivity growth					
	(1)	(2)	(3)	(4)	(5)	(6)
SUM	0.12*	0.16**				
	(0.07)	(0.07)				
EXC			0.25*	0.29**		
			(0.14)	(0.14)		
NET					0.18	0.30
					(0.13)	(0.20)
Labor Shares	No	Yes	No	Yes	No	Yes
Number of observations	990	990	990	990	990	990
Panel B	Combined (baseline + trade credit) flows					
	Productivity growth					
	(1)	(2)	(3)	(4)	(5)	(6)
SUM	0.14*	0.18**				
	(0.08)	(0.08)				
EXC			0.27*	0.30**		
			(0.14)	(0.13)		
NET					0.17	0.28*
					(0.12)	(0.17)
Labor Shares	No	Yes	No	Yes	No	Yes
Number of observations	990	990	990	990	990	990

Online Appendix E: Other Regulatory Reforms

In Section 9, we discussed two major deregulation reforms that occurred respectively in the United States and in China and into which the analysis could yield insights. We here discuss other policy reforms that could constitute potential areas of application of the analysis. In the scenarios discussed below, tracking the reallocation of credit, besides credit growth, after the policy reforms could help understand to what extent the reforms reduced or increased credit market dynamism.

Recently, the U.S. deregulation of small banks in 2018, contained in the Economic Growth, Regulatory Relief and Consumer Protection Act, relaxed some restrictions on smaller banks introduced by the Dodd-Frank Act. The original act applied its most stringent standards to any bank that had $50 billion in assets or more, whereas the 2018 law lifted that standard to $100 billion for 18 months and to $250 billion down the line for many banks. However, many of the important aspects of Dodd-Frank remained in place. Little is known on how credit market dynamism could have been affected by this reform.

Outside the United States, the analysis could also yield some insights into the credit market liberalization of Vietnam. The Vietnamese banking system has experienced significant reforms towards deregulation since the 1990s. These reforms involved relaxing restrictions on the entry and opening of branches of foreign banks, and encouraging foreign institutional ownership in local banks. JSCBs (Joint Stock Commercial Banks) have also been permitted and foreign banks have been allowed

to enter the market via the opening of branches or the establishment of joint ventures with domestic banks. Tracking the dynamic process of credit reallocation following these deregulation reforms could help understand their effects on the dynamism of the Vietnamese credit market.

Finally, the analysis could give insights into the process of creation of the EU Banking Union. Despite the advances towards a more integrated European institutional and regulatory framework, for many banking products and services the European banking sector remains segmented across countries, even within the single prudential jurisdiction of European banking supervision: "foreign" assets in euro area banks have not changed significantly since the creation of the banking union.[6] Moreover, subsidiaries currently account for around two-thirds of EU foreign assets in the euro area, whereas branches account for the remaining third. Further harmonization of the insolvency laws, the creation of a common deposit insurance scheme, and the revision of the methods of waivers for liquidity and capital could lead to further geographic integration and enhance banks' freedom to move liquidity within their groups. Banks could also review their cross-border organisational structure more actively, relying more extensively on branches, rather than subsidiaries. Again, in the context of the ongoing process of integration of the banking sector in the European Union, tracking the dynamic process of credit reallocation could help understand the effects of the integration process on credit market dynamism in the individual member states of the European Union.

[6]Most consolidations still take place within member states and much of the progress in cross-border integration was reversed after the great financial crisis.

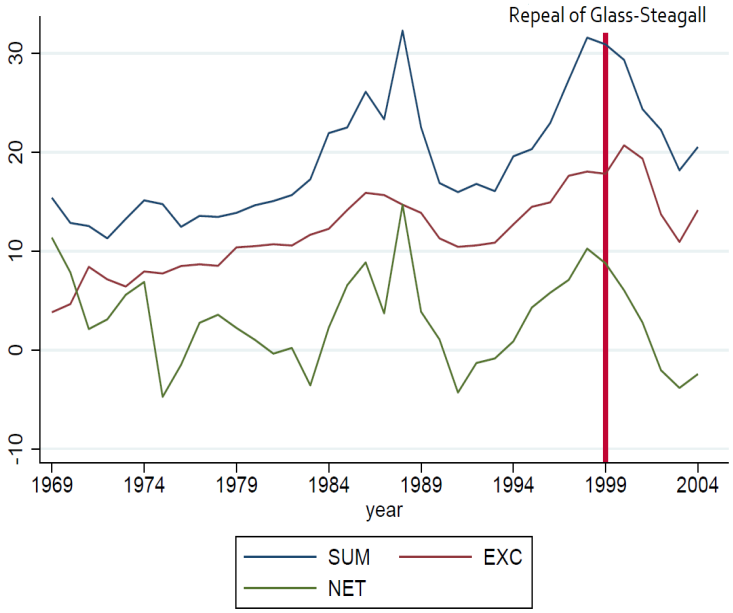

Figure E.1: This figure plots national measures of SUM, EXC, and NET from 1969-2004. The national measures are weighted averages of the state-level variables with GDP share used as weights. The red vertical line is 1999, representing the repeal of Glass-Steagall.