

U.S. Banking Deregulation, Small Businesses, and Interstate Insurance of Personal Income*

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Abstract

We estimate the effects of deregulation of U.S. banking restrictions on the amount of interstate personal income insurance during the period 1970–2001. Interstate income insurance occurs when personal income reacts less than one-to-one to state-specific shocks to output. We find that income insurance improved after banking deregulation, and that this effect is larger in states where small businesses are more important. We further show that the impact of deregulation is stronger for proprietors' income than for wage income. Our explanation of this result centers on the role of banks as a prime source of small business finance and on the close intertwining of the personal and business finances of small business owners. Our analysis casts light on the real effects of bank deregulation, on the insurance function of banks, and on the integration of bank markets.

Keywords: Financial deregulation, integration of bank markets, interstate risk sharing, small business finance.

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1 Introduction

Since the 1970s, the structure of the U.S. banking industry has changed considerably following deregulation of restrictions on branching and interstate banking. The ensuing wave of consolidation has increased the average bank company size and allowed banks to expand into new geographical markets by operating larger branch networks or bank holding companies.

Banks play a central role in the allocation of capital in the economy and is the prime source of finance to small businesses. We examine if the changes in bank market structure has had real effects for small business owners.¹ In particular, we examine whether interstate personal income insurance increased after deregulation: we compare income insurance in states where small businesses are respectively more and less prevalent and we consider the sensitivity of proprietors' income to state-level output shocks. By income insurance, we mean the extent to which, in a given state, state-specific personal income fluctuates with state-specific shocks to output. In states that are financially integrated with other states, agents may trade (contingent) claims on output (e.g., equity or direct investments) across state-borders thereby sharing state-specific risks with residents of other states, and (partly) insulating personal income from fluctuations in state-level output. Through transactions with intermediaries such as banks, agents share output risks *indirectly* via the contracts they hold with the bank. If banking deregulation has improved integration of previously separated bank markets, interstate income insurance may well have improved.

The effect of banking deregulation on income insurance is estimated using annual state-level data for the period 1970–2001. We first establish that the average level of income insurance is lower in states with many small businesses. Further, we find that banking deregulation has a positive effect on income insurance overall. The marginal effect of banking deregulation is in the order of 5–13 percentage points, in the sense that an additional 5–13 percent of a state-specific output shock is smoothed on average, and this effect is larger in states where small businesses are more prevalent. Hence, in states with many small businesses, the additional improvement in income insurance is in the order of 10–20 percentage points.² We provide additional evidence for our hypothesis by showing that

¹We define small businesses as those having less than 100 employees—with this definition small businesses comprise an important part of the economy. In the average state, businesses with less than 100 employees made up 58 percent of total employment in 1978. (The Small Business Administration defines small businesses as having less than 500 full-time equivalent employees.)

²We employ two measures of deregulation: dummies for the dates of banking deregulation, first used by Jayaratne and Strahan (1996), and a measure of bank assets acquired through mergers and acquisitions, constructed from Call Reports by Rhoades (1985, 1996).

the impact of banking reform is considerably larger for proprietors' income than for other components of personal income.

Risk sharing between individuals and (local) banks will be associated with *interstate* income insurance only if banks share risk nationwide. There are, therefore, two important dimensions in which banking deregulation may affect interstate income insurance. First, banking deregulation may affect the interaction between small firms and their banks and, second, banks may share risk better with out-of-state banks or individuals. We discuss these dimensions in turn.

The informational opaqueness of small businesses without an established reputation for quality prevents them from raising arm's-length finance in public markets. Banks, on the other hand, may mitigate such informational asymmetries through repeated interaction and monitoring (Diamond (1984, 1991), and Rajan (1992)). When a bank provides finance to a firm, it shares risk with the firm's owners by bearing a part of the firm's output risk. This may be especially important for small businesses as they depend on bank loans for their operations. In contrast, when a business is entirely self-financed by the owner, the owner bears all output risk himself and cannot insure his personal income from shocks to his business. This is reflected in the cross-sectional pattern of state-level income insurance that we establish: states with many small businesses or many proprietors, exhibit a lower average level of income insurance. This finding is consistent with Agronin (2003), who finds that income insurance is lower in states where proprietors' income makes up a larger share of personal income.

Banking deregulation may have improved the insurance of personal income by increasing the availability of small business finance, whether to new or existing borrowers. Alternatively, even if the total volume of small business loans were unchanged, banking deregulation may have altered banks' pattern of lending, allowing small business owners to further the separation of their personal finances from those of their firm. This latter channel points to the importance of bank-borrower relationships for the efficiency of the capital allocation process. In a valuable bank-borrower relationship, the bank may have incentives to offer (self-enforcing) implicit contracts that facilitate insurance, for example through the continued extension of credit during bad times (Allen and Gale (2000) and Boot (2000)). Each of these two channels would work to lower the correlation between output and personal income.

Along the other dimension, banking reform may affect interbank risk sharing as a result of mergers and acquisitions across state borders and the formation of multi-state bank holding companies. Houston, James, and Marcus (1997) demonstrate that bank holding

companies manage capital and liquidity at the consolidated level. However, also mergers *within* state borders may affect risk sharing. Intrastate mergers create larger banks which are typically more integrated in national markets than small local banks. For example, a large bank such as Citibank has extensive nation-wide (indeed, world-wide) operations compared to a small town savings bank. Furthermore, banks share risk with other banks and financial institutions by borrowing and lending in US-wide interbank and money markets. Banks may borrow and lend out-of-state in order to help stabilize *income* of small business owners.³ Hence, bank actions may affect income insurance also without explicit multi-state cross-ownership between banks.⁴

Banking deregulation have taken two forms: intrastate deregulation, which allowed banks to branch statewide, and inter-state deregulation. In this paper, we consider states to be “deregulated” following both intra- and interstate deregulation.⁵ While the labels may suggest that *inter-state deregulation* should be the main determinant of *inter-state risk sharing*, it should be clear from the above discussion that such a direct link applies only in the case of cross-state mergers.

The disproportionate increase in risk sharing in states with many small businesses is striking. We conjecture that deregulation may have altered the pattern of banks’ small business lending in two main ways: 1) improved efficiency of the banks operating after deregulation and 2) improved efficiency of interbank capital allocation, in the sense that deregulation improved banks’ ability to share risks amongst themselves, the benefits of which were passed on to borrowers. We discuss the empirical evidence underlying these conjectures in Section 2.2.

Call Report data on small business lending by U.S. banks has been reported only since

³For example, banks in agricultural states can stabilize income (in that state) by borrowing in the face of adverse weather shocks.

⁴Banking deregulation may have affected interstate income insurance in other ways which are not necessarily related to small businesses. One channel may work through the capital income of households. Personal income have been smoothed through households’ capital income if changes in the size of bank organizations smoothed income streams earned by owners of securities issued by banks. Banks are owned, perhaps indirectly, by individual stock holders who ultimately bear the risk of the banks’ operations. When stock holders live out-of-state, this results in interstate risk sharing. Alternatively, multi-state bank organizations may disperse the effect of state-specific shocks to the banking industry itself throughout the organization. For example, following losses in one state, layoffs and cost-cuttings may be extended to subsidiaries and branches in other states. Or further, if bank finance makes it easier for firms to raise external non-bank finance, banking deregulation may have helped smooth dividends paid by such firms.

⁵We tried, with little success, to separate out the effects of the two types of deregulation but there is little variation across states in the timing of inter-state deregulation, making econometric identification hard. Given the higher variation in the timing of intra-state deregulation our results are mainly driven by this type of deregulation. Obviously, if such deregulation were not important, we would simply get statistically insignificant results.

1994.⁶ Hence, we cannot directly test for changes in banks' patterns of small business lending following deregulation. However, we provide evidence that state-specific personal income is smoothed more following deregulation and that this improvement in income insurance is stronger in states with a relatively high prevalence of small businesses. We also demonstrate that proprietors' income became less pro-cyclical following deregulation. These patterns are consistent with our hypothesis that banks' small business lending is important for the insurance of small business owners' income and that this channel of income insurance became more effective following deregulation.

Other papers have examined the real effects of branching deregulations in the U.S. In an important contribution, Jayaratne and Strahan (1996) show that state per capita growth increased in states that deregulated, both when measured in terms of personal income and state GDP.⁷ Our findings are closely related to those of Jayaratne and Strahan as both papers identify banking deregulation as an impetus for an economic process with significant real effects at the macro level. In this paper, we additionally identify the link between banks' insurance role in the financing of small businesses as a potential channel of welfare gain from bank integration. Petersen and Rajan (1994) find evidence that small businesses in the U.S. benefit from lending relationships and our results complement theirs by pointing to the value of bank relationships in small businesses finance.⁸

Our paper is also related to research on the integration of U.S. states. Asdrubali, Sørensen, and Yosha (1996) study income insurance through cross-regional holdings of debt and equity ("capital market income smoothing") and through the super-regional tax-transfer system ("federal government income smoothing").⁹

The rest of the paper is organized as follows. Section 2 discusses in more detail the channels through which deregulation may affect the insurance of state-specific personal income. Section 3 briefly presents the history of banking deregulation in the U.S. Section 4 presents our measure of interstate income insurance, Section 5 describes our data, and Section 6 presents the empirical results. Section 7 concludes.

⁶See, e.g., Wolken (1998).

⁷They also demonstrate, importantly, that branching deregulations are exogenous to state-level growth, that is, states did not tend to deregulate in the expectation of an imminent economic upturn.

⁸Other work on this issue include Morgan, Rime, and Strahan (2004) who find that integration lowers state-specific variation in (total and small business) employment.

⁹Atkeson and Bayoumi (1993) seem to have been the first to bring up the issue of income insurance across U.S. states through private capital markets. See also Crucini (1999) for another early paper on risk sharing across U.S. states. Sala-i Martin and Sachs (1992) suggest that the federal government in the U.S. provides substantial income insurance to states through procyclical taxes and countercyclical transfers. That paper, and many following it, has focussed on U.S. states as members of a successful currency union (the United States) that should be studied as a model for the European Union.

2 Channels of improvements in personal income insurance

2.1 Evidence on small business finance in the U.S.

Our hypothesis, that personal income insurance improved after deregulation through banks' small business lending, builds on two fundamental observations: 1) small firms depend heavily on bank-intermediated finance, 2) the intertwining of owners' financial position with that of their business.¹⁰ In the following, we discuss this evidence and its relation to our hypothesis.

It is well-established empirically that bank-intermediated finance is one of the main sources of small business funding in the U.S. For example, Berger and Udell (1998) present evidence from the 1993 National Survey of Small Business Finance (NSSBF) which demonstrates that small businesses rely heavily on commercial bank finance from their very first years. According to the survey, bank debt finance constitutes 16 percent of total assets for "infant" (0–2 years) firms, and 31 percent of "adolescent" (3–4 years) firms. For older firms, the ratio is 17 percent (on average). This is compared to total equity stakes of 48 percent, 39 percent and 52 percent, respectively (*ibid*, table 1, p. 620). Commercial bank debt is, overall, the most important external source of finance.¹¹

An important characteristic of small business finance is the intertwining of business owners' financial position with that of their business. Hence, funds (mostly in the form of equity) provided by the principal owner is the *most* important source, amounting to 35 percent of all funding. Trade credit is the third most important source of funds. Furthermore, outside finance often has personal commitments attached. Avery, Bostic, and Samolyk (1999) report that 80 percent of the small firms which have loans, have loans with personal commitments.¹² Ang (1992) reports that about 40 percent of small business loans and 60 percent of loan dollars are guaranteed and/or secured by personal assets.

The 1993 NSSBF also documents the importance of finance, esp. equity, from insider sources other than the owner, that is, from family, friends and other people involved in the business. Such equity was the second most important source of equity, constituting 13

¹⁰Ang (1992), Berger and Udell (1998), and Avery, Bostic, and Samolyk (1999).

¹¹The most common form of small business debt supplied by commercial banks—constituting 56 percent of total small business debt—is lines of credit. The next most important loan types are mortgage and equipment loans, 15 percent and 10 percent, respectively (Berger and Udell (1998)).

¹²That is, loans with either personal collateral or a personal guarantee attached. In the case of personal collateral, the creditor holds a prioritized claim on specific assets of the borrower and controls the use of the assets. A personal guarantee is a more general claim on personal wealth which places fewer restrictions on the guarantor's use of his wealth. The figures are based on the 1987 and 1993 NSSBF and the Survey of Consumer Finances.

percent of total assets (Berger and Udell (1998)).

The above observations are, of course, consistent with the notion that agency conflicts rooted in asymmetries of information are severe for small businesses. As noted above, the interpretation of our results centers on the dependency of small businesses on bank intermediated finance.¹³ It is exactly because the average small business has no real substitutes for bank finance, other than own funds or funds raised from family and friends, that part of the efficiency gain from banking deregulation is likely to work through small businesses. Through the requirement of part self-financing, collateral and guarantees, and through monitoring and repeated interaction over time, banks may mitigate problems of adverse selection and moral hazard.¹⁴

Banking deregulation may have improved personal income insurance by increasing the availability of small business loans or by altering the lending pattern of banks. For illustration, consider an entirely self-financed sole proprietorship. In this case, the small business owner bears all the firm's output risk himself—shocks to the surplus created in the firm will be transferred one-to-one to his personal income. When the owner obtains external finance, the linkage between his personal finances and those of the business is relaxed and the covariation of personal income with output will fall. Essentially, the larger the claim a bank has on a firm, the more of the output risk is borne by the bank as opposed to the owner. Banks may also share risk with the owner by not interrupting the lending relationship when the business hits hard times, allowing the borrower to fall behind with payments of interest and installments. Of course, banks also share risk by taking losses when businesses default. Furthermore, the availability of external finance may help small business owners smooth their income to the extent it furthers diversification of the owners' sources of income. For example, he may accumulate savings outside the business, e.g., in housing or financial investments, generating a stream of future income that is less than perfectly correlated with the success of the business.

2.2 Deregulation, small business lending and risk sharing among banks

Banking deregulation may have improved personal income insurance if either the *level* of bank intermediated finance to small businesses increased or the *pattern* of banks' small business lending changed. In this section, we present and discuss the existing empirical

¹³Although venture and angel finance are substitutes for some small firms, the above studies show that in terms of magnitude, these sources do not represent a real alternative to bank finance for the average firm.

¹⁴See, e.g., Leland and Pyle (1977), Bester (1985), Besanko and Thakor (1987), and Holmstrom and Tirole (1997).

evidence on which we base our conjecture that changes in the pattern of lending play an important role in the improved smoothing of personal income.

How may deregulation have altered the pattern of lending? Banking deregulation may have deepened integration of bank markets due to changes in bank size and organization. The lifting of geographical barriers may have worked to improve risk sharing between banks themselves. Following deregulation, both stand-alone banks and holding companies grew in size and expanded into new markets. Some empirical evidence is available to suggest that these structural changes may well have affected banks' cost and ability to share risks.

Banks that belong to a multi-state organization may benefit from access to internal capital markets and share risks with borrowers at a lower cost. Houston and James (1998) show that unaffiliated banks are more cash flow constrained than banks affiliated with a holding company.

Also, bank size may matter. Larger banks may be less opaque and hence better able to mitigate problems of asymmetric information in capital markets. Kashyap and Stein (2000) show that small banks do not use uninsured funds to smooth the effect of monetary policy innovations, likely because of information frictions in interbank markets. Ostergaard (2001) finds evidence that these frictions are significant at the state level and that (state-level) bank lending in states dominated by small banks is more closely tied to banks' internal liquidity position.

Furthermore, deregulation enhanced banks' investment opportunity set. Geographical diversification may have improved banks' ability to bear (idiosyncratic) credit risk. Demsetz and Strahan (1997) show that better diversification in large bank holding companies permits operation with higher leverage and more business loans in the portfolio.

Finally, deregulation may have altered the lending behavior of banks if incumbent banks in previously protected markets were operating inefficiently and deregulation permitted the entry of better managed banks. If entering banks were superior in the screening of potential borrowers' prospects (identifying higher net present value projects), more high quality borrowers would be financed. Jayaratne and Strahan (1996) argue that average bank efficiency improved after deregulation and show that losses on banks' loan portfolios diminished.

Improvement in income insurance would, however, also be consistent with an increase in the availability of small business finance following deregulation. *Call Report* data on small business loans by U.S. banks does not exist prior to 1994 and we know of no direct evidence on banks' small business lending prior to this date. Jayaratne and Strahan (1996) study the effect of deregulation on *total* bank loan growth and find only weak positive effects.

It appears that deregulation haven't shifted banks' total loan supply, although the data is silent on the composition of banks' loan portfolio.

Several studies have used post-1994 data to address whether mergers and acquisitions affected the volume of small business lending. This evidence may be representative for the reorganizations that took place in the 1980s. Generally, the evidence does support the notion that small business lending contracted despite consolidation in the banking industry and the fact that larger banks typically carry fewer small business loans on their books than do smaller banks (for prudential and regulatory reasons). On the other hand, there is little evidence to support the opposite conclusion, that small business lending tended to increase.¹⁵

Consolidation in the banking industry may have altered competition between banks and, thereby, the costs and benefits to firms involved in banking relationships. Through the process of lending, banks acquire information about borrowers and an informed bank may use its information monopoly to extract rent from the borrower (Sharpe (1990), Rajan (1992)). Competition between lenders may limit the sustainability of implicit contracts and the sharing of intertemporal surplus between borrowers and lenders as found by Petersen and Rajan (1995). On the other hand, Boot and Thakor (2000) argue that increased competition may induce banks to invest relatively more in relationships because the return on relationship lending improves relative to the return on transaction lending. If consolidation lowered competition in deregulated states, it may have improved the value of bank-borrower relationships and banks' willingness to share risks. Alternatively, if deregulation increased competition, relationships may have been affected detrimentally.¹⁶ Whether deregulation has had an impact on income insurance through changes in competition between banks, however, is ultimately an empirical question. Our results suggest that potentially detrimental effects on income insurance, if they exist, are of second order.

¹⁵See Peek and Rosengren (1998), Strahan and Weston (1998), Goldberg and White (1998), and DeYoung (1998).

¹⁶Considering the effect of interstate branching deregulations starting in 1994, Dick (forthcoming) reports that concentration at the regional level increased, whereas concentration at the urban (MSA) level was unchanged. See also the discussion in Black and Strahan (2002) on the effect of competition on business creation.

3 The history of U.S. banking deregulation

Restrictions on banks' ability to branch and operate holding company structures in the U.S. has been subject to state legislation since the 1920s.¹⁷ The regulations imposed at the state-level were in the form of restrictions on the formation of multi-bank holding companies, restrictions on de novo branching, and on branching by mergers and acquisitions. Of these, restrictions on banks' ability to establish state-wide branching networks were typically the last to be lifted.¹⁸

Until the 1980s, legislation in most states either completely prohibited branching within the state or restricted the geographical area in which a bank could open branches (for example to city or county boundaries). As late as 1985, 26 states imposed limitations on statewide branching. At the end of 1990, five states still upheld restrictions.¹⁹ Interstate banking (as opposed to branching) through bank holding companies was only gradually permitted by individual states during the 1980s. Maine was the first state to allow entry by out-of-state bank holding companies in 1978 and was followed by other states in the 1980s. Typically, acquisitions by out-of-state bank holding companies were limited to banks from same-region states and subject to reciprocity, that is, entry was only permitted if the acquiring banks' home state allowed entry by banks from the target state, although some states were open to nationwide entry.²⁰

Finally, interstate branching was permitted nationwide with the Reigle-Neal Interstate Banking and Branching Efficiency Act, which became effective June 1997, although states had the opportunity to opt in at an earlier date.²¹

Differences in states' willingness to allow branch networks sustained the development of very differently structured bank systems across states. Where some states allowed only unit banking, other states permitted statewide branching which led to more concentrated bank sectors when measured at the state level. At the same time, the limited ability to diversify portfolios geographically created a close interdependency between the state economy and the health of local banks. As regulations were gradually relaxed, deregulated

¹⁷The McFadden Act of 1927 essentially prohibited intrastate branching by subjecting the branching of national banks to state authority. The Douglas Amendment to the Bank Holding company Act of 1956 further restricted interstate expansion by barring bank holding companies from acquisitions in another state unless specifically authorized by that state.

¹⁸Kroszner and Strahan (1999) analyze the determinants of the timing of bank deregulation and find that states with more small bank-dependent firms tended to deregulate earlier. States with more unstable banks also tended to deregulate earlier.

¹⁹Arkansas, Colorado, Illinois, Minnesota, and New Mexico.

²⁰Restrictions on de novo entry was typically only relaxed at a later point in time.

²¹Two states, Texas and Montana, opted out.

bank sectors transformed. Changes in competitive pressures, geographic diversification and scale-economies on both the loan- and deposit-side affected loan losses and the cost of capital, and hence the loan interest rates charged. Jayaratne and Strahan (1998) find that relaxation of, in particular, intrastate branching restrictions were the source of large improvements in bank efficiency by allowing better-run banks to capture a larger share of local markets. Low-cost banks grew faster than under-performing banks following deregulation and state averages for loan losses and operating expenses fell. Jayaratne and Strahan show that most of the impact of these improvements were passed on to borrowers in the form of lower loan interest rates.²²

Following deregulation, considerable consolidation occurred, predominantly through mergers and acquisitions. McLaughlin (1995) documents that the deregulation of intrastate branching restrictions caused changes in market structure faster than interstate banking restrictions. She shows that bank holding companies have responded promptly and in large numbers to deregulation of branching restrictions by merging previously separated subsidiaries, whereas responses to interstate deregulations were slower but picked up considerable speed in the late 1980s. In the latter case, bank holding companies tended to expand intra-regionally, rather than cross-regionally.

4 Measuring income insurance

We measure the degree to which personal income is insured between states of the United States. Our measure builds on the measure of risk sharing through capital markets developed in Asdrubali, Sørensen, and Yosha (1996). The following set of assumptions have become standard in the risk sharing literature: a representative consumer of each region maximizes life-time expected utility from consumption. If utility functions are CRRA, and all regions have a common intertemporal discount factor, a perfect (Pareto efficient) risk sharing allocation satisfies $C_{it} = k_i C_t$ for all t and all realizations of uncertainty, where C_{it} and C_t denotes regional and aggregate consumption, respectively. The constant k_i is independent of time and state of the world. It reflects the “power” (including initial wealth) of state i in the risk sharing arrangement.

Because our focus is the interconnection of small business owner’s personal finances with those of their firms, we focus on income insurance (smoothing). If full risk sharing is achieved via income smoothing, then $INC_{it} = k_i INC_t$ where INC_{it} and INC_t denotes

²²They estimate that average loan rates fell by three-fifths of the reduction in loan losses and only find small, generally statistically insignificant, increases in bank profitability after deregulation.

state and aggregate personal income per capita, respectively. If income is fully insured, the income of different states may be at different levels but since the constant k_i is independent of time, full income smoothing implies that all states have identical growth rates of income. This implication forms the basis of our empirical estimations.

Let PINC_{it} and Y_{it} denote the *growth rates* of state personal income and state GDP, respectively. Under full income risk sharing all states have the same growth rate of income: $\text{PINC}_{it} = \text{PINC}_{jt}$ for all states i and j for all time periods t . Equivalently, $\text{PINC}_{it} - \overline{\text{PINC}}_{.t} = 0$ where $\overline{\text{PINC}}_{.t}$ is the average across all states in period t . The interpretation is that the average income growth cannot be insured through cross-state income diversification.²³ $(Y_{it} - \overline{Y}_{.t})$ and $(\text{PINC}_{it} - \overline{\text{PINC}}_{.t})$ then constitute state-specific output and personal income, respectively. We prefer our measure to be robust to long lasting differences in income and output growth. States with high immigration of retirees, such as Florida, may well see income growing faster than income when retirees—who don't produce output but receives income—move in. We, therefore, adjust output and income in state i for the state-specific means, i.e, we will study how much $\widetilde{\text{PINC}}_{it} = \text{PINC}_{it} - \overline{\text{PINC}}_{.t} - \overline{\text{PINC}}_{.i}$ co-varies with $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$.

Rather than testing if risk sharing is perfect, we develop a measure of income insurance. We want to define income insurance in state i in period t to be zero if income moves one-to-one with output, i.e., if $\widetilde{\text{PINC}}_{it} = \widetilde{Y}_{it}$. We, therefore, define the amount of personal income insurance in state i at time t as

$$\text{INS}_{it} = 1 - \frac{\widetilde{\text{PINC}}_{it}}{\widetilde{Y}_{it}}. \quad (1)$$

This measure is defined year-by-year and state-by-state and it will be quite volatile. Occasionally, a state may have a growth rate similar to the average growth rate and, in order to not divide by zero, we substitute a value of 0.001 (preserving the sign) for values of \widetilde{Y}_{it} less than 0.001 in absolute value.²⁴ Alternatively, one might consider deleting observations with very small idiosyncratic output shocks but because such observations contain some information about risk sharing, we prefer to truncate such observations rather than deleting them from the sample. Measurement error in the risk sharing variable is not a source of bias when it is used as a dependent variable in our regressions later on. Even with this adjustment, a few values of INS_{it} are clearly outliers and we delete observations where the

²³We could subtract the aggregate rather than the average with very little effect on the results and no change in the interpretation.

²⁴In the extreme case, where \widetilde{Y}_{it} happens to equal 0 exactly, the measure is undefined and does not contain information about the amount of risk sharing—intuitively, this is simply because there is no idiosyncratic risk to share.

absolute value of INS_{it} is larger than 10.0 (resulting in the deletion of 29 observations).²⁵

The income insurance measure should be interpreted as follows: if state i in year t does not participate in risk sharing with other U.S. states, $\widetilde{PINC}_{it} = \widetilde{Y}_{it}$ and INS_{it} will be zero. A value of $INS_{it} > 0$ implies income insurance. The more positive is INS_{it} , the less state-specific income follows state-specific output and we will interpret a value of 1 as perfect risk sharing. If state-specific income in year t is “smoother” than output, we find ($0 < INS_{it} < 1$); if it is “counter-cyclical,” we get ($INS_{it} > 1$). A negative value implies that state-specific income moves more than one-to-one with state-specific output—shocks to output are amplified in personal income.

In order to examine if income insurance changes with banking deregulation, we construct a dummy variable D_{it} that takes the value 0 in state i in the years before banking deregulation and the value 1 from the first year where both intrastate and interstate banking were permitted. We denote this variable “Full Banking Deregulation” to indicate that it takes the value of 1 when the state is fully open to integration. We refer the reader to Section 5 for exact variable definitions.

We then perform the regression

$$INS_{it} = \alpha + \beta D_{it} + \epsilon_{it}, \quad (2)$$

where a positive value of β indicates that income insurance improved with banking deregulation. Alternatively, one might use the date of intrastate deregulations as a regressor. This variable does, however, not carry the same explanatory power as full openness in the regressions. Ideally, one would like to know the separate impacts of both intra-state and full deregulation but there is not enough variation for us to use both variables simultaneously and we cannot successfully use the date of interstate deregulation as a regressor because it exhibits very little variation across states.

We further construct a continuous measure of banking deregulation which reflects the impact of both intrastate and interstate deregulation, namely, the fraction of cumulative acquired bank assets in state i (scaled by total bank assets or state GDP) as the regressor. This variable is a more direct measure of the structural changes that occurred in bank markets following deregulations and captures changes in bank size, geographic diversification and integration into multistate banking organizations that were a result of mergers and acquisitions. Acquired assets is not a perfect measure of banking integration and it

²⁵When we calculate this measure using the much more volatile series for proprietors’ income, rather than personal income, we delete observations where INS_{it} is larger than 150 in absolute value, resulting in the deletion of 8 observations.

could potentially be endogenous. For example, banks in high risk regions being more likely to merge with out-of-state institution in order to pool risk. We do not think endogeneity concerns are important but because we cannot rule them out, we do not rely exclusively on this variable. We, therefore, perform regressions using both the deregulation dummy and cumulative acquired assets. We believe results that are qualitatively robust to the choice of regressors are credible.

We use cumulative acquired assets by defining the variable $CASS = \ln(1 + \text{cumulative (scaled) bank assets acquired})$ in the regressions. The log-transformation is used because the series grow exponentially over time for most states as can clearly be seen from Figure 1, where we depict cumulative acquired bank assets for five arbitrarily chosen states. We perform regressions of the form

$$INS_{it} = \alpha + \beta CASS_{it} + \epsilon_{it}. \quad (3)$$

The intercept in (2) and (3) has the interpretation as the average degree of income insurance, across states and time.²⁶ The coefficient β is the marginal effect of bank market integration on average income insurance.

Testing whether banking integration improved income insurance for small business owners, we construct a dummy variable, SB_i , that equals one for states where the share of people employed in small businesses in 1978 was above or below the median value in our sample.²⁷ We interact this dummy with the regressors in the baseline regressions to estimate if income insurance is larger on average in states with more small businesses. As a robustness check we alternatively measure the importance of small businesses by the number of small *firms* in 1988 (the earliest available year). The results using this measure are very similar and we, therefore, do not tabulate them.

We perform the regression

$$INS_{it} = \alpha + \beta D_{it} + \zeta D_{it}SB_i + \epsilon_{it}. \quad (4)$$

The parameter of interest is ζ , which measures if the effect of deregulation is larger in states with more small businesses. We expect to find a positive estimate—that is, we expect the effect of deregulation to be stronger in states with many small businesses.²⁸

²⁶In the regressions, we demean *all* regressors, i.e., $(D_{it} - \bar{D}_{it})$, $(CASS_{it} - \overline{CASS}_{it})$, and similar for all other regressors used, so as to leave the estimated intercept unaffected by the average value of D_{it} and $CASS_{it}$. This does not affect the interpretation of β as the marginal effect of bank integration.

²⁷We get similar results if we define the dummy variable for the states relative to average employment, rather than median employment.

²⁸Our previous results would be quite similar if we used panel data regressions similar to those of Asdrubali,

In the panel data regressions, we transform the left-hand side in order to obtain a roughly bell-shaped distribution. We use the transformation $sign(INS_{it}) \ln(1 + |INS_{it}|)$. Figure 4 confirms that this transformation results in a regressand with a roughly bell-shaped distribution.²⁹ From the construction of INS_{it} , we expect regression errors to be inversely related to the size of the denominator \tilde{Y}_{it} . A scatter plot (Figure 5) reveals the squared errors from an initial OLS-estimation to be proportional to $1/\tilde{Y}_{it}$ and, in order to obtain roughly homoskedastic errors, we weight all observations by $\sqrt{\tilde{Y}_{it}}$.

5 Data

We use a panel of variables for the 50 U.S. states minus Delaware, Alaska, and Wyoming for the period 1970–2001.³⁰ Below, we describe the main sources of data and the methodology used to construct the variables used in the analysis. As all our measures are in per capita terms, we often omit the term “per capita” for the sake of brevity. Growth rates of real per capita variables are calculated as first differences of natural log of per capita level values.³¹

State Gross Domestic Product: We use the Bureau of Economic Analysis (BEA) data for gross state product which is defined as the “value added” of the industries of a state deflated by the consumer price index to obtain real per capita state gross domestic product (gross state product).

Personal Income: We use BEA state-level personal income deflated by consumer prices to obtain real per capita personal income by state.³² Measures of components of personal income; proprietors’ income, wages, and dividends, interest and rental income are also taken

Sørensen, and Yosha (1996). However, if we use their setup, a regression equivalent to (4) would involve triple-interaction terms, which are extremely difficult to interpret.

²⁹When the INS_{it} measure is based on proprietors’ income, a number with much more variation, we use the transformation $5 \cdot sign(INS_{it}) \ln(1 + |INS_{it}|/5)$.

³⁰We exclude Delaware from the sample due to laws that provide tax incentives for credit card banks to operate there. As a result, the banking industry in Delaware grew much faster than other states in the 1980s. Alaska and Wyoming are excluded because the expansion of the oil-related industry coincided with the timing of banking deregulation. As a large part of the oil-related business is owned by entities located outside the two states, the expansion entails considerable risk sharing. Inclusion of the two states therefore biases our results *towards* finding a positive effect of banking deregulation on income insurance. Indeed, this was confirmed by preliminary regression results based on a sample including Alaska and Wyoming.

³¹We deflate output using the consumer price deflator rather than the output deflator because we want to measure the purchasing power of output.

³²Interstate smoothing of earnings can occur through commuting across state borders. The BEA takes into account commuters’ income in the construction of personal income data. Therefore, our measure incorporates this kind of interstate income insurance. Similar holds for distributed profits, interest, and rent, which occurs when residents of one state hold securities of corporations and property in other states.

from the BEA.

Interstate and Intrastate Branching Restrictions: We measure the direct effect of deregulation using an indicator variable which equals one in years where both interstate and intrastate branching were permitted. We follow the practice of Jayaratne and Strahan (1996) and Kroszner and Strahan (1999) and define the date of intrastate deregulations as branching deregulation through mergers and acquisitions allowing multibank holding companies to convert subsidiaries into branches. Deregulation dates are from Kroszner and Strahan (1999) for the 1978–2001 sample and from Amel (1993) for the years 1970–1977, see Table 1.

Cumulative Bank Assets Acquired: As an alternative measure of bank integration, we consider the cumulated value of bank assets in state i at time j that were acquired by banks through mergers and acquisitions. The location of the target bank determines the state assignment. Hence, this measure captures both mergers and acquisitions within the state but also those acquisitions made by out-of-state banks. We scale this value in each year by the value of total bank assets in the state or, alternatively, by gross state product. The data is based on the U. S. *Call Reports* from the period 1960–1994 and are taken from Rhoades (1985, 1996) (the data cannot be reliably interpreted on a state basis beyond 1994, hence, all regressions involving acquired bank assets employ 1994 as the sample end-point).

We measure the degree of importance of small businesses in a state as the proportion of people employed in small businesses establishments relative to total employment in 1978, the earliest date available. (Data for the share of small businesses in the population of *firms* is not available prior to 1988.) We say that small businesses are relatively more “prevalent” in a state if this proportion is higher than the median value across all states.

Small Business Employment: By *small* we mean establishments with a number of employees less than 100. The data is available from Geospatial and Statistical Data Center, University of Virginia library.³³ Employment is paid employment, which consists of full and part-time employees, including salaried officers and executives of corporations. Included are employees on sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.

Proprietor’s income: This component of personal income is the current-production income (including income in kind) of sole proprietorships and partnerships and of tax-exempt cooperatives. Corporate directors’ fees and the imputed net rental income of owner-occupants

³³See <http://fisher.lib.virginia.edu/collections/stats/cbp/state.html>

of farm dwellings are included in proprietors' income, but the imputed net rental income of owner-occupants of non-farm dwellings is included in rental income of persons. Proprietors' income excludes dividends and monetary interest received by nonfinancial business and rental incomes received by persons not primarily engaged in the real estate business; these incomes are included in dividends, net interest, and rental income of persons, respectively. Data is available from the BEA.

We present descriptive statistics, including the correlation matrix, for our main regression variables in Table 2. The two measures of cumulative acquired assets are obviously highly correlated with a coefficient of 0.88, whereas the correlation with the deregulation dummy is between 0.40 and 0.46. This indicates that the cumulative acquired asset measures capture somewhat different aspects of banking reform than the deregulation dummy. The other correlations are all below 0.4 in absolute value.

6 Results and discussion

6.1 Level of income insurance and prevalence of small businesses

We begin by examining interstate income insurance and its relation to the prevalence of small businesses in Table 3. We regress the insurance measure INS_{it} on a constant and a dummy, SB_i , which equals one if small businesses employment in state i were above the median across states. We normalize the dummy to be mean zero on average, so the estimated coefficient to the constant measures the average amount of income insurance. We find, as reported in the first row, that the constant (interpreted as the average value of the dependent variable for our sample) period was 29.6, which translates into 34 percent income smoothing on average.³⁴ This number is of the same magnitude as that found by Asdrubali, Sørensen, and Yosha (1996) who directly regressed income growth on the growth in gross state product.

The estimated coefficient to the small business dummy is estimated to be negative and statistically significant. This establishes the stylized fact that the average level of income insurance is lower in states where small businesses are more prevalent. This is consistent with our hypothesis that small business owners find it relatively harder to insure their income from output shocks due to the intertwining of their personal income with that of their business.

³⁴The dependent variable is $\ln(1 + INS)$ (for positive values of INS), so 34 is found as $100 * (\exp(.296) - 1)$.

6.2 Income insurance, bank market integration and small businesses

In order to give a first impression of the impact of bank integration, we show—in Figure 2—the growth-rates of state-specific GDP and personal income for five arbitrarily chosen states and, for reference, the U.S. wide averages. It is immediately obvious from Figure 2 that state-level income is insured in the sense that movements in income are damped relative to those of gross state product. For California, it appears from the figure that income is better insured following deregulation (income follows gross state product less closely after 1987) but, in general, it is hard to read the impact of bank integration from the figures—this is partly due to a decrease in the volatility of gross state product in the later years of our sample.³⁵

In Table 4, we present our estimates of income insurance obtained before and after banking reform. In column 1, we include a dummy variable that takes the value of 1 after banking reform. We find, according to the point estimate, that the left-hand side variable on average increased by a coefficient of 12.8, which translates into 13.2 percentage points more income insurance, after banking reform. The estimate is clearly significant at the one percent level. This finding is consistent with banking reform leading to improved income insurance.

In columns 2 and 3, we employ the more direct measures of structural changes in bank markets following deregulation; namely, the cumulated fraction of bank assets acquired in state i through mergers and acquisitions in each year normalized by either total assets or gross state product. We find estimates similar to those found in column 1, with positive coefficients that are significant at the one percent level. To give an interpretation of the economic significance of the size of the coefficient, consider the cumulative fraction of acquired assets which, on average, grew from 5.2 percent in 1970 to 37.8 percent in 1994. Using the estimates from column 2, that change in bank assets acquired translates into an increase of 11 percentage points in income insurance over the sample period.³⁶ This order of magnitude is very similar to that found using the dummy variable. The results, in column 3, for cumulative assets normalized by state output are similar to those of column 2.

In Table 5, we add an interaction term that captures the importance of banking reform for small businesses. We interact either the deregulation dummy or the acquired assets variables. Consider the regressions using the deregulation dummy. The coefficient estimate

³⁵Morgan, Rime, and Strahan (2004) find evidence that this decrease is partly explained by banking deregulation.

³⁶Acquired asset are measured in percent, so the transformation is $100 * [\exp(5.8 * [\ln(1 + 37.8) - \ln(1 + 5.2)]) - 1] = 11.2$.

of 7.2 in column 1, for the increase in income smoothing in states with relatively many small business employees, corresponds to 7.5 percentage points more income smoothing. Considering the regression with cumulative acquired bank assets relative to total bank assets, the additional effect in states with more small business employment is 3.7 (column 2), corresponding to 3.8 percentage points more income insurance.³⁷ The results in column 3, where the acquired assets are normalized by gross state output, are quite similar. The results for the interaction term in Table 5 are significant only at the 10 percent level. However, the impact is robustly estimated across the three columns and, therefore, quite credible. As predicted by theory, states where small businesses are more prevalent experience a stronger positive effect of bank market integration.

In Table 6, we include a trend in the regressions. Interstate income insurance in the U.S. has been systematically increasing over time (Asdrubali, Sørensen, and Yosha (1996)) and we might find a positive effect of banking deregulation due to left-out variable bias if we do not allow for a trend in income insurance. We, therefore, include a time trend taking the value of $(t - 1969)$ in year t . Allowing for a trend lowers the coefficient estimate for the average impact of banking reform. Using the deregulation dummy, the estimated average effect of deregulation is insignificant, while it is borderline significant at the 5 percent level using cumulative acquired assets. The estimated trend is, as expected, positive. The trend is likely caused partly by bank deregulation and the regression is not able to clearly separate the impact of deregulation from the trend. However, the predicted differential impact on states with more or less small business employment is robust to the inclusion of a trend: the estimates in Table 6, for the interaction terms, are very similar to those estimated in Table 5 and those coefficients are still significant at the 5 percent level.

6.3 Income insurance and proprietors' income

In Table 7, we show that state-level income insurance is significantly lower in states with a large fraction of proprietors. This result is qualitatively similar to the results of Agronin (2003), who used a somewhat different implementation.

As a further test of our hypothesis that banking deregulation affected the scope for income insurance through small business owners-managers' financial situation, we consider how deregulation affected the reaction of proprietors' income to output shocks. We consider the effect of deregulation on the sensitivity of proprietors' income to output shocks as

³⁷For small values, the log-transformation has a very small impact and we will ignore the approximation in the further discussion of results.

an alternative way of providing evidence of the small business channel.³⁸ Proprietors' income; wages; and dividends, interest, and rental income constitute on average 8 percent, 57 percent, and 19 percent, respectively, of personal income during our sample period.

We construct a measure of the sensitivity of state-level proprietor's income to growth in gross state product. We define this measure of proprietors' income "smoothing" in a manner similar to INS_{it} (substituting proprietor's income for personal income). This is *not* a measure of the insurance of proprietors' income, because we do not know proprietors' share of state GDP. Otherwise, the interpretation is similar to that of Section 4.

Table 8 presents the regression results. The intercept is large in absolute value and negative, indicating that proprietors' income is very pro-cyclical (relative to state-specific output). The coefficient estimate of -53 means that, on average, a one percentage point decrease in gross state product (holding aggregate GDP constant) implies a 1.53 percentage point fall in proprietor's income. In other words, proprietors' income is more volatile than state GDP. From Figure 3, where we plot annual growth rates of state-specific GDP and proprietors' income, it is obvious that proprietors' income is strongly pro-cyclical. The estimated positive coefficient on the deregulation dummy (column 1) and cumulative acquired assets (columns 2 and 3) suggests that banking reform diminished the volatility of proprietors' income dramatically. The coefficients on the deregulation measures are significant at the 1 percent level and very large in economic terms. The point estimate of the deregulation dummy indicates that after banking reform proprietors income moved in the same direction as output shocks but only half as much (quite similar to the estimated sensitivity of overall personal income). This estimated effect of banking deregulation seems somewhat too large—the lower range of the 5 percent confidence interval is more reasonable and this roughly agrees with the estimated economic impact measured from the cumulative acquired assets variables. The point estimates from columns 2 and 3 indicate that proprietors' income is still more sensitive to the state-specific business cycle than average income, but significantly less so (in economic terms) after banking deregulation.

In Table 9, we show that the results in Table 6 are qualitatively unchanged (and statistical significance preserved) when a trend is allowed for—it seems that the sensitivity of proprietors income to state GDP is not trending beyond what can be explained by banking deregulation.

Overall, banking deregulation seems to have lowered the cyclicity of proprietor's in-

³⁸Part of small business owners' income may be received in the form of dividends when the business is incorporated. That fraction of personal income is not captured in proprietors' income, but enters the dividends, interest, and rental income component of personal income. We have, however, no means of separating this part out of the BEA dividend series.

come dramatically.

6.4 Further empirical results: Components of income and state-fixed effects

In Table 10, we compare the “smoothing” of proprietors’ income with that of other income components reported by the BEA. For each income component we calculate a measure similar to INS_{it} , with the relevant income component substituted for personal income. As for proprietors’ income, this measure is not, strictly speaking, a measure of risk sharing, but an inverse measure of the sensitivity of the income component to the state-specific business cycle.

Wages are “smoothed” similarly to personal income—that is not surprising since wages are the main component of personal income. Interestingly, banking deregulation has no impact on the sensitivity of wages to aggregate output shocks. When using cumulative acquired assets, the point estimate is actually significantly negative, but combining the absence of good theoretical reasons for such a result with lack of robustness, we hesitate to stress this negative point estimate. Dividend, income, and rent is less sensitive to output movement than the other income components. This is to be expected—in fact dividends from nationwide investment is the primary example of how one can diversify income geographically. Banking reform does not change the sensitivity of this income component to output shocks. Table 11 shows the results of Table 10 are robust to inclusion of a time trend in the regression.

Our regressions, so far, impose the constraint that average income insurance is identical for each state included in a regression. In Table 12, we briefly examine if our results are robust to allowing for state-specific constants (fixed effects, in panel data jargon).

Table 12 shows aggregate income insurance for the groups of states with more or less small business employment. We do not display the estimated values of the state-specific dummy variables so Table 12 displays only the coefficient to the bank deregulation variable for each specification. In this table, we split the sample of states in two groups, rather than using the dummy variable for small business prevalence—we show this alternative specification as a further test of robustness. The results robustly show that banking reform had no impact on income insurance in states with little employment in small businesses. Using cumulated acquired assets we find a strong significant impact on states with many small businesses. Using the deregulation dummy we find a large estimated coefficient of 9.1, although this estimate is not significant at the 5 percent level. The lower statistical

significance in this table is the result of having “removed” the cross-state variation with the state-specific dummy variables, but the overall impression from Table 12 is that our central result is quite robust.

7 Conclusion

This paper provides evidence that U. S. banking deregulation, and the consequent changes in bank market structure, had significant real effects on the economy through the role played by banks as small business financiers and insurers of the personal income of small business owners.

In particular, we show that (personal) income insurance increased significantly in states which deregulated banking restrictions—independently of whether we measure deregulation by the year of deregulation or by cumulated bank assets acquired. This result is, however, somewhat sensitive to whether a time trend is included in the regression when we measure banking reform using a dummy for deregulation.

Our hypothesis is that banking reform affects income insurance because of the intertwining of the personal finances of bank-dependent small business owners with the finances of their firms. We find two sets of results consistent with this hypothesis. First, we show that the positive effect of deregulation on income insurance is significantly stronger in states where small businesses are more important measured in terms of share of employment. Second, we show that proprietors’ income was dramatically less sensitive to output shocks following banking deregulation. These two sets of results are very robustly.

We conjecture that the changes in the U.S. banking industry that have lead to an improvement in income insurance are due to improved efficiency of interbank capital allocation and/or improved efficiency in lending to small businesses after deregulation. In particular, it may be that income insurance within bank organizations improves due to geographical diversification and higher participation of regional banks in nationwide financial markets.

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Table 1:
Year of Deregulation of Restrictions on Geographical Expansion

States	Intrastate branching through M&A	Interstate banking permitted
Alabama	1981	1987
Alaska	1960	1982
Arizona	1960	1986
Arkansas	1994	1989
California	1960	1987
Colorado	1991	1988
Connecticut	1980	1983
Delaware	1960	1988
District of Columbia	1960	1985
Florida	1988	1985
Georgia	1983	1985
Hawaii	1986	**
Idaho	1960	1985
Illinois	1988	1986
Indiana	1989	1986
Iowa	**	1991
Kansas	1987	1992
Kentucky	1990	1984
Louisiana	1988	1987
Maine	1975	1978
Maryland	1960	1985
Massachusetts	1984	1983
Michigan	1987	1986
Minnesota	1993	1986
Mississippi	1986	1988
Missouri	1990	1986
Montana	1990	1993
Nebraska	1985	1990
Nevada	1960	1985
New Hampshire	1987	1987
New Jersey	1977	1986
New Mexico	1991	1989
New York	1976	1982
North Carolina	1960	1985
North Dakota	1987	1991
Ohio	1979	1985
Oklahoma	1988	1987
Oregon	1985	1986
Pennsylvania	1982	1986
Rhode Island	1960	1984
South Carolina	1960	1986
South Dakota	1960	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

Source: Kroszner and Strahan (1999) for the years 1978–2001 and Amel (1993) for the years prior to 1978. For states that deregulated before 1960 the date is listed as 1960, since the actual date of deregulation is unknown.

** indicates that states did not deregulate until the end of our sample period, 2001.

Table 2:
Income Insurance, Cumulative Acquired Bank Assets,
Full Banking Deregulation, and Small Businesses.

Descriptive Statistics					
	Mean	St.deviation	Sample		
Income Insurance (INS)	0.29	0.75	1970-2001		
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	0.19	0.12	1970-1994		
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	0.09	0.05	1970-1994		
Employment Share in Small Businesses	0.57	0.13	in 1978		

Correlations. Sample: 1970-1994					
	INS	CASS_A	CASS_GDP	SMB	DEREG
Income Insurance (INS)	1.00	0.12	0.01	0.01	0.10
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	–	1.00	0.88	–0.21	0.46
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	–	–	1.00	–0.38	0.40
Empl. Share in Small Bus. (SMB)	–	–	–	1.00	–0.26
Full Deregulation (DEREG)	–	–	–	–	1.00

Note: “Income Insurance” (INS_{it}) measures (personal) income insurance: $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widetilde{PINC}_{it} / \widetilde{Y}_{it}$, $\widetilde{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_{.i}$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and $\overline{PINC}_{.i}$ is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product. “Cumulative Acquired Bank Assets” is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. “Employment Share in Small Businesses” is the share of employment in establishments with less than 100 employees relative to total employment in state i in 1978. “Full deregulation” ($DEREG_{it}$) is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise.

Table 3:
Income Insurance and the Prevalence of Small Businesses.

Constant	29.6 (1.1)
Dummy for Prevalence of Small Businesses (SB_i)	-4.5 (2.1)

Note: Results from the following GLS regression:

$$INS_{it} = \alpha + \beta SB_i + \epsilon_{it}.$$

INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widehat{PINC}_{it}/\widetilde{Y}_{it}$, $\widehat{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_i$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_i$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and \overline{PINC}_i is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and \overline{Y}_i are defined similarly for gross state product. SB_i is a dummy variable that equals one if state i belongs to the subsample of states where the fraction of employment in small businesses (less than 100 employees) were more prevalent (above median) in 1978 and zero otherwise. Sample is 1970–2001. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 4:
The Effect of Banking Deregulation and Acquisitions
of Bank Assets on Income Insurance.

	Model A	Model B	Model C
Constant	30.0 (1.1)	28.0 (1.2)	27.9 (1.2)
Full Banking Deregulation	12.8 (2.2)	– –	– –
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	– –	5.8 (1.0)	– –
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	– –	– –	6.4 (1.2)

Note: Results are from the following GLS regressions:

Model A: $INS_{it} = \alpha + \beta D_{it} + \epsilon_{it}$.

Models B and C: $INS_{it} = \alpha + \beta CASS_{it} + \epsilon_{it}$.

INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widetilde{PINC}_{it}/\widetilde{Y}_{it}$, $\widetilde{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_{.i}$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and $\overline{PINC}_{.i}$ is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product. “Full Banking Deregulation”, D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. “Cumulative Acquired Bank Assets”, $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. Sample is 1970–2001 for Model A, and 1970–1994 for Models B and C. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 5:
The Effect of Banking Deregulation and Acquisitions
of Bank Assets on Income Insurance
in States with Many and Few Small Businesses.

	Model A	Model B	Model C
Constant	30.1 (1.1)	28.0 (1.2)	27.9 (1.2)
Full Banking Deregulation	12.2 (2.2)	– –	– –
$D_{it} \times SB_i$	7.2 (4.4)	– –	– –
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	– –	5.8 (1.1)	– –
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	– –	– –	6.0 (1.3)
$CASS_A_{it} \times SB_i$	– –	3.7 (2.1)	– –
$CASS_GDP_{it} \times SB_i$	– –	– –	4.2 (2.6)

Note: Results are from the following GLS regressions:

Model A: $INS_{it} = \alpha + \beta D_{it} + \zeta D_{it} \cdot SB_i + \epsilon_{it}$.

Models B and C: $INS_{it} = \alpha + \beta CASS_{it} + \zeta CASS_{it} \cdot SB_i + \epsilon_{it}$.

INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widehat{PINC}_{it} / \widetilde{Y}_{it}$, $\widehat{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_i$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_i$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and \overline{PINC}_i is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and \overline{Y}_i are defined similarly for gross state product. “Full Banking Deregulation”, D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. SB_i is a dummy variable that equals one if state i belongs to the subsample of states where the fraction of employment in small businesses (less than 100 employees) were more prevalent (above median) in 1978 and zero otherwise. “Cumulative Acquired Bank Assets”, $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. Sample is 1970–2001 for Model A, and 1970–1994 for Models B and C. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 6:
The Effect of Banking Deregulation and Acquisitions
of Bank Assets on Income Insurance in States
with Many and Few Small Businesses, Allowing for Time Trend.

	Model A	Model B	Model C
Constant	30.2 (1.0)	27.9 (1.2)	27.7 (1.2)
Full Banking Deregulation	-1.0 (3.4)	- -	- -
$D_{it} \times SB_i$	9.0 (4.4)	- -	- -
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	- -	2.7 (1.3)	- -
Cumulative Acquired Bank Assets (CASS_GDP: scaled by state gross state product)	- -	- -	2.3 (1.6)
$CASS_A_{it} \times SB_i$	- -	4.4 (2.1)	- -
$CASS_GDP_{it} \times SB_i$	- -	- -	5.2 (2.6)
Time trend	0.9 (0.2)	0.7 (0.2)	0.8 (0.2)

Note: Results are from the following GLS regressions:

Model A: $INS_{it} = \alpha + \beta D_{it} + \zeta D_{it} \cdot SB_i + \gamma(t - 1969) + \epsilon_{it}$.

Models B and C: $INS_{it} = \alpha + \beta CASS_{it} + \zeta CASS_{it} \cdot SB_i + \gamma(t - 1969) + \epsilon_{it}$.

INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widetilde{PINC}_{it} / \widetilde{Y}_{it}$, $\widetilde{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_{.i}$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and $\overline{PINC}_{.i}$ is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product. “Full Banking Deregulation”, D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. SB_i is a dummy variable that equals one if state i belongs to the subsample of states where the fraction of employment in small businesses (less than 100 employees) were more prevalent (above median) in 1978 and zero otherwise. “Cumulative Acquired Bank Assets”, $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. Sample is 1970–2001 for Model A, and 1970–1994 for Models B and C. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 7:
Income Insurance and the Prevalence of Proprietors.

	In 1970	Avg. 1970–2001
Constant	33.7 (1.5)	34.3 (1.5)
No. of proprietors per capita (PROP _{it})	−8.6 (2.1)	−9.6 (2.1)

Note: Results from the following GLS regression:

$$\text{INS}_{it} = \alpha + \beta \text{PROP}_{it} + \epsilon_{it}.$$

INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(\text{INS}_{it}) \cdot \ln(1 + |\text{INS}_{it}|)$, where $\text{INS}_{it} = 1 - \widetilde{\text{PINC}}_{it} / \widetilde{Y}_{it}$, $\widetilde{\text{PINC}}_{it} = \text{PINC}_{it} - \overline{\text{PINC}}_{.t} - \overline{\text{PINC}}_i$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_i$. PINC_{it} is (real) personal income (per capita) in state *i* in period *t* and *Y*_{it} is defined similarly using gross state product. $\overline{\text{PINC}}_{.t}$ is the average of PINC across states in year *t* and $\overline{\text{PINC}}_i$ is the average of PINC across time in state *i*. $\overline{Y}_{.t}$ and \overline{Y}_i are defined similarly for gross state product. PROP_{it} is a dummy variable that equals one if state *i* belongs to the subsample of states where the number of proprietors per capita were more prevalent (above median) in 1970 or on average over the sample period and zero otherwise. Sample is 1970–2001. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 8:
The Effect of Banking Deregulation and Acquisitions of Bank Assets
on the Sensitivity of Proprietors' Income to Output Shocks.

	Model A	Model B	Model C
Constant	-53.2 (9.2)	-63.7 (10.7)	-64.4 (10.7)
Full Banking Deregulation	103.8 (19.0)	- -	- -
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	- -	53.9 (9.4)	- -
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	- -	- -	62.8 (11.4)

Note: Results are from the following GLS regressions:

Model A: $SENS_{it} = \alpha + \beta D_{it} + \epsilon_{it}$.

Models B and C: $INS_{it} = \alpha + \beta CASS_{it} + \epsilon_{it}$.

$SENS_{it}$ measures the sensitivity of (real) proprietors' income (per capita) to output shocks. In the regressions, the dependent variable is $5 \cdot \text{sign}(SENS_{it}) \cdot \ln(1 + |SENS_{it}|/5)$, where $SENS_{it} = 1 - \widetilde{PROPINC}_{it}/\widetilde{Y}_{it}$, $\widetilde{PROPINC}_{it} = PROPINC_{it} - \overline{PROPINC}_{.t} - \overline{PROPINC}_{i.}$ and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{i.}$. $PROPINC_{it}$ is (real) proprietors' income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PROPINC}_{.t}$ is the average of $PROPINC$ across states in year t and $\overline{PROPINC}_{i.}$ is the average of $PROPINC$ across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{i.}$ are defined similarly for gross state product. "Full Banking Deregulation", D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. "Cumulative Acquired Bank Assets", $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 9:

The Effect of Banking Deregulation and Acquisitions of Bank Assets on the Sensitivity of Proprietors' Income to Output Shocks, Allowing for Time Trend

	Model A	Model B	Model C
Constant	-53.3 (9.2)	-63.1 (10.7)	-63.7 (10.7)
Full Banking Deregulation	114.6 (29.7)	- -	- -
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	- -	63.1 (11.3)	- -
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	- -	- -	75.7 (14.1)
Time trend	-0.8 (1.6)	-2.7 (1.9)	-2.9 (1.9)

Note: Results are from the following GLS regressions:

Model A: $INS_{it} = \alpha + \beta D_{it} + \gamma(t - 1969) + \epsilon_{it}$.

Models B and C: $INS_{it} = \alpha + \beta CASS_{it} + \gamma(t - 1969) + \epsilon_{it}$..

INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widehat{PINC}_{it}/\widehat{Y}_{it}$, $\widehat{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_{.i}$, and $\widehat{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and $\overline{PINC}_{.i}$ is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product. "Full Banking Deregulation", D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. "Cumulative Acquired Bank Assets", $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. Sample is 1970–2001 for Model A, and 1970–1994 for Models B and C. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 10:

The Effect of Banking Deregulation and Acquisitions of Bank Assets
on the Sensitivity of Components of Personal Income to Output Shocks

	Pers. Inc.	Propr. Inc.	Wages	Int., Div. & Rent
Constant	30.0 (1.1)	-53.2 (9.2)	32.1 (1.2)	44.8 (1.7)
Full Banking Deregulation	12.8 (2.2)	103.8 (19.0)	-0.7 (2.4)	-3.0 (3.4)
Constant	28.0 (1.2)	-63.7 (10.7)	30.6 (1.3)	44.3 (1.8)
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	5.8 (1.0)	53.9 (9.4)	-5.0 (1.1)	-1.4 (1.6)
Constant	27.9 (1.1)	-64.4 (10.7)	30.7 (1.3)	44.3 (1.8)
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	5.7 (2.1)	62.8 (11.4)	-5.6 (1.4)	-1.9 (2.0)

Note: Results are from the following regressions:

Top panel: $INS_{it} = \alpha + \beta D_{it} + \epsilon_{it}$.

Middle and bottom panels: $INS_{it} = \alpha + \beta CASS_{it} + \epsilon_{it}$.

INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widehat{PINC}_{it} / \widetilde{Y}_{it}$, $\widehat{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_{.i}$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and $\overline{PINC}_{.i}$ is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product. “Full Banking Deregulation”, D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. “Cumulative Acquired Bank Assets”, $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. Sample is 1970–2001 for top panel, and 1970–1994 for middle and bottom panels. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 11:

The Effect of Banking Deregulation and Acquisitions of Bank Assets on the Sensitivity of Components of Personal Income to Output Shocks, Allowing for Time Trend.

	Pers. Inc.	Propr. Inc.	Wages	Int., Div. & Rent
Constant	30.1 (1.0)	-53.3 (9.2)	32.1 (1.2)	44.9 (1.7)
Full Banking Deregulation	0.2 (3.4)	114.6 (29.7)	3.1 (3.7)	-11.5 (5.3)
Time trend	0.9 (0.2)	-0.8 (1.6)	-0.3 (0.2)	0.6 (0.3)
Constant	27.8 (1.2)	-63.1 (10.7)	30.6 (1.3)	44.3 (1.2)
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	3.5 (1.2)	63.1 (11.3)	-4.9 (1.4)	-2.2 (2.0)
Time trend	0.7 (0.2)	-2.7 (1.9)	0.0 (0.2)	0.2 (0.3)
Constant	27.7 (1.2)	-63.7 (10.7)	30.7 (1.3)	44.2 (1.8)
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	3.1 (1.5)	75.7 (14.1)	-5.4 (1.7)	-3.0 (2.4)
Time trend	0.8 (0.2)	-2.9 (1.9)	0.0 (0.2)	0.3 (0.3)

Note: Results are from the following GLS regressions:

Top panel: $INS_{it} = \alpha + \beta D_{it} + \gamma(t - 1969) + \epsilon_{it}$.

Middle and bottom panels: $INS_{it} = \alpha + \beta CASS_{it} + \gamma(t - 1969) + \epsilon_{it}$..

INS_{it} measures (the sensitivity of components of income to output shocks. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \tilde{x}_{it}/\tilde{y}_{it}$ and $\tilde{y}_{it} = y_{it} - \bar{y}_{.t} - \bar{y}_{i.}$; x_{it} represents components of personal income: personal income, proprietors' income; wages; and interest, dividends, and rent, respectively. y_{it} is (real) gross state product (per capita) in state i in period t . $\tilde{x}_{it} = x_{it} - \bar{x}_{.t} - \bar{x}_{i.}$. $\bar{x}_{.t}$ is the average of x across states in year t and $\bar{x}_{i.}$ is the average of x across time in state i . $\bar{y}_{.t}$ and $\bar{y}_{i.}$ are defined similarly for gross state product. "Full Banking Deregulation", D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. "Cumulative Acquired Bank Assets", $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. Sample is 1970–2001 for top panel, and 1970–1994 for middle and bottom panels. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Table 12:

The Effect of Banking Deregulation and Acquisitions of Bank Assets on Income Insurance. Results for Two Subsamples: States with More and Fewer Small Businesses, Allowing for State Fixed Effects.

	More Small Businesses	Fewer Small Businesses
Full Banking Deregulation	9.1 (6.4)	-1.4 (6.1)
Cumulative Acquired Bank Assets (CASS_A: scaled by total bank assets)	10.9 (4.3)	-0.7 (4.1)
Cumulative Acquired Bank Assets (CASS_GDP: scaled by gross state product)	11.9 (4.5)	-0.4 (4.7)

Note: Results are from the following GLS regressions:

Row 1: $INS_{it} = \alpha_i + \beta D_{it} + \epsilon_{it}$.

Rows 2 and 3: $INS_{it} = \alpha_i + \beta CASS_{it} + \epsilon_{it}$.

i in period t . INS_{it} measures (personal) income insurance. In the regressions, the dependent variable is $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widehat{PINC}_{it}/\widehat{Y}_{it}$, $\widehat{PINC}_{it} = \text{PINC}_{it} - \overline{\text{PINC}}_{.t} - \overline{\text{PINC}}_{.i}$, and $\widehat{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. PINC_{it} is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{\text{PINC}}_{.t}$ is the average of PINC across states in year t and $\overline{\text{PINC}}_{.i}$ is the average of PINC across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product. A state is in the subgroup with More Small Businesses if the share of employment in small businesses (above 100 employees) were above the median for states in 1978. “Full Banking Deregulation”, D_{it} , is an indicator variable that equals one if restrictions on interstate banking and intrastate branching were lifted in year t or earlier for the corresponding state and zero otherwise. “Cumulative Acquired Bank Assets”, $CASS_{it}$, is cumulative bank assets acquired in state i through mergers and acquisitions in period t or earlier. $CASS_A$ equals the log of one plus cumulative acquired bank assets normalized by total bank assets. $CASS_GDP$ is defined similarly, except that cumulative acquired bank assets are normalized by gross state product. Sample is 1970–2001 for top panel and 1970–1994 for middle and bottom panels. States excluded are: Alaska, Delaware, and Wyoming. Standard errors are in parentheses. All coefficients and standard errors are multiplied by 100.

Figure 1: Cumulative Acquired Assets (scaled by total assets)

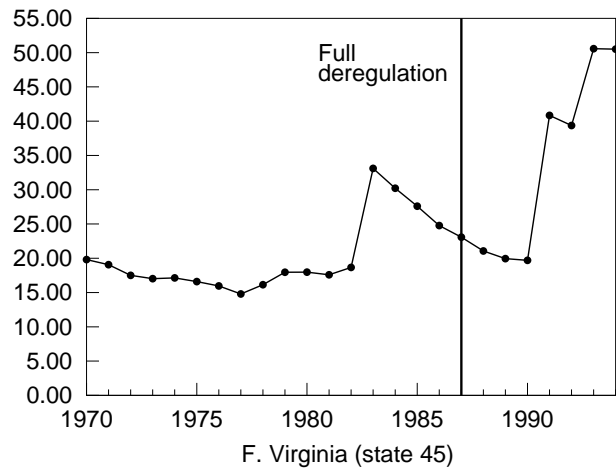
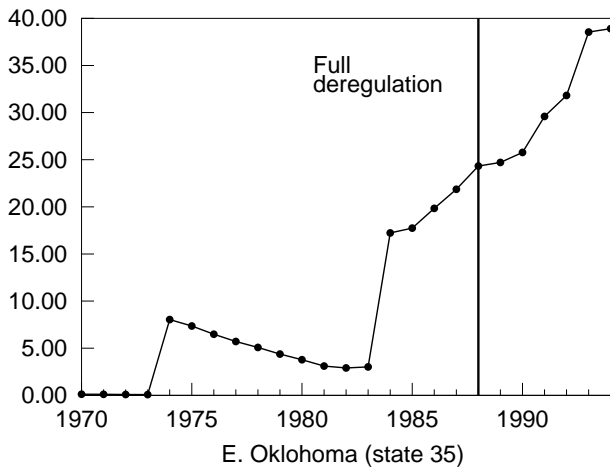
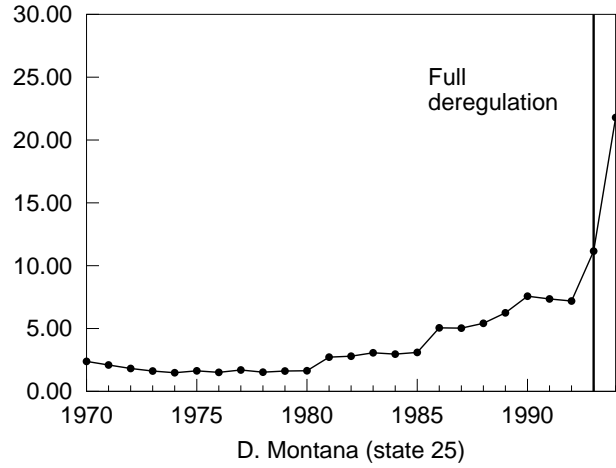
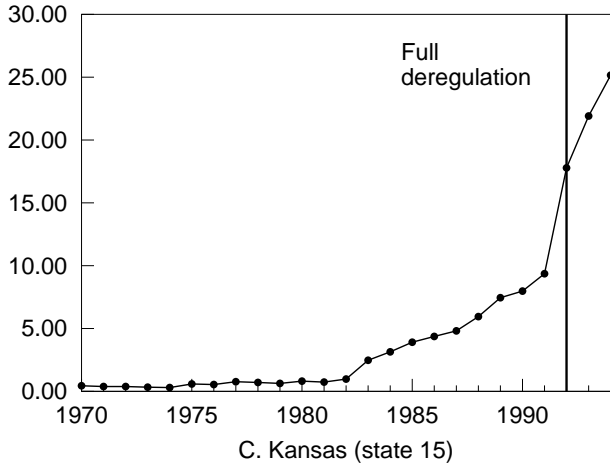
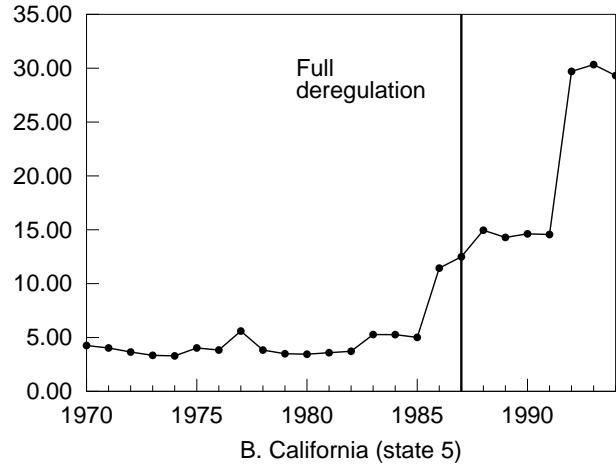
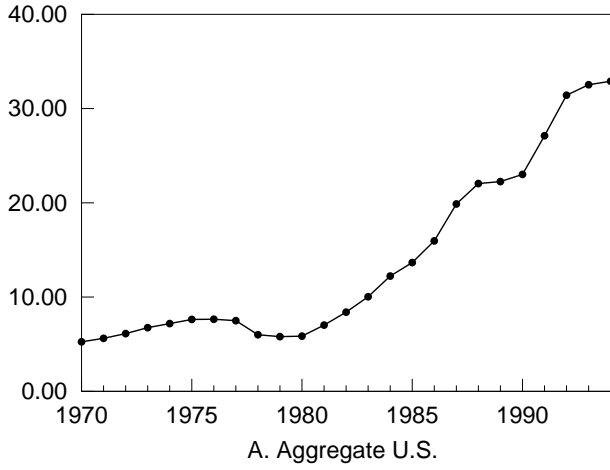


Figure 2: Average and State-Specific Growth Rates of GSP and Personal Income

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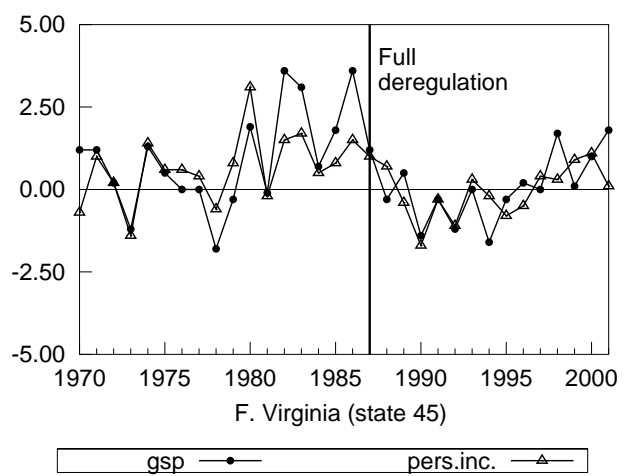
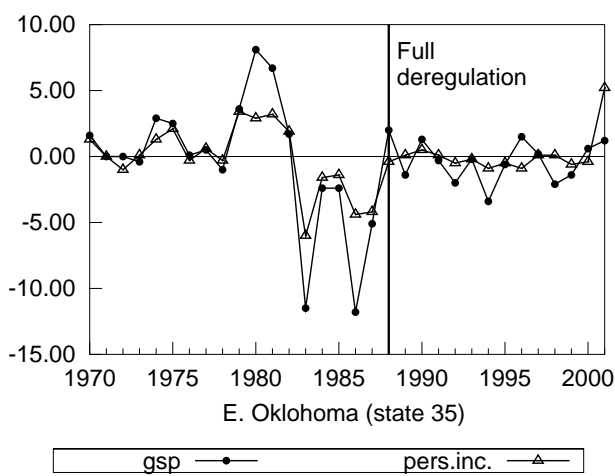
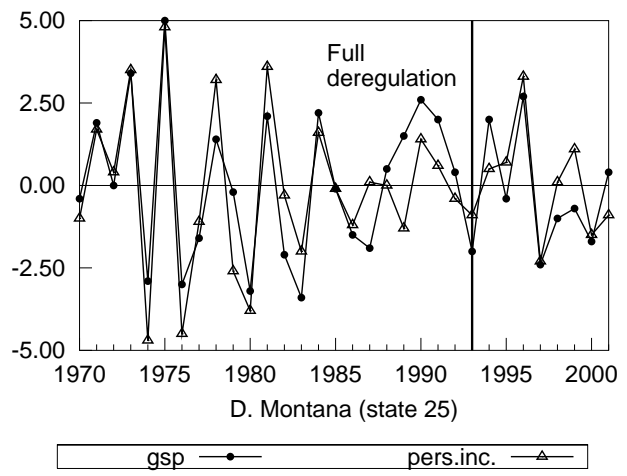
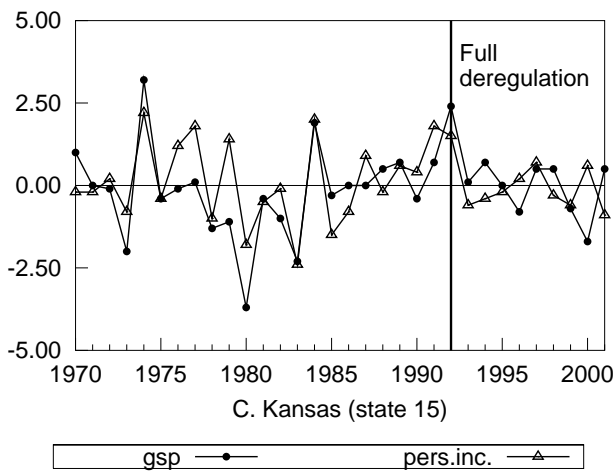
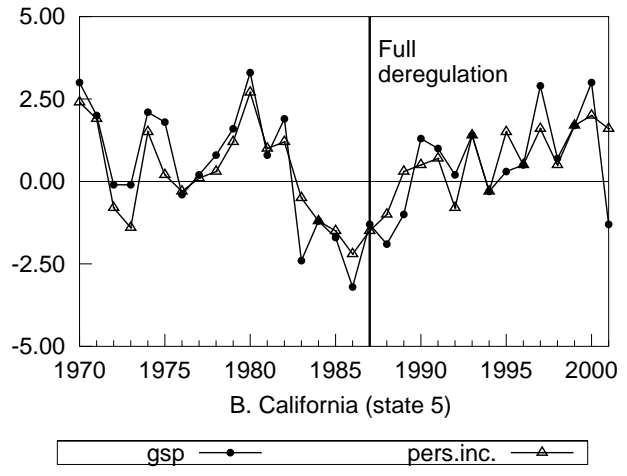
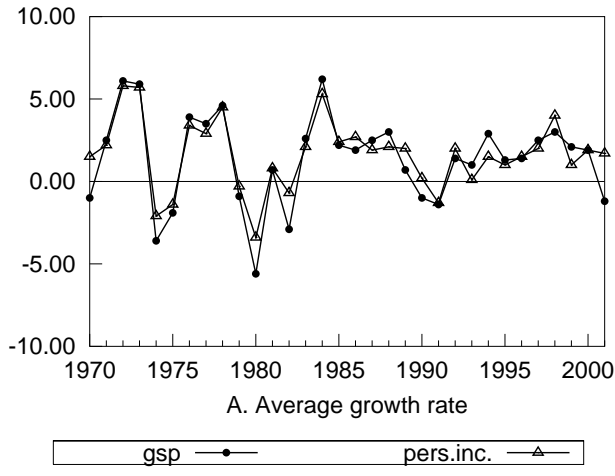
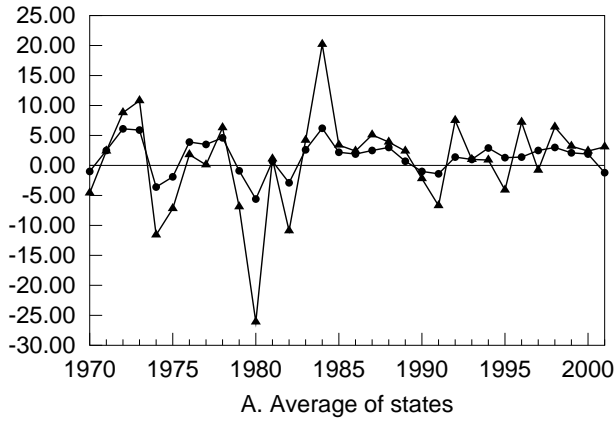
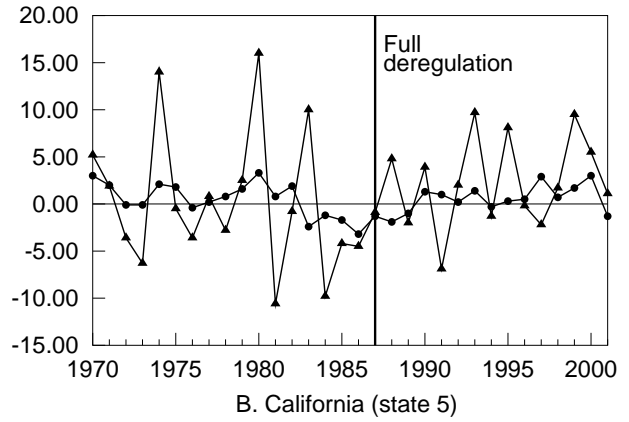


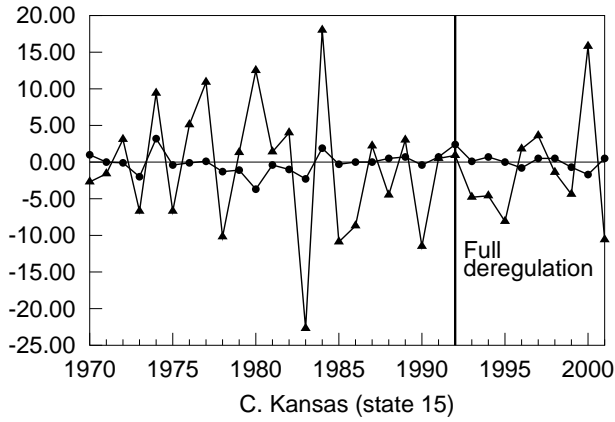
Figure 3: Average and State-Specific Growth Rates of GSP and Proprietors' Income



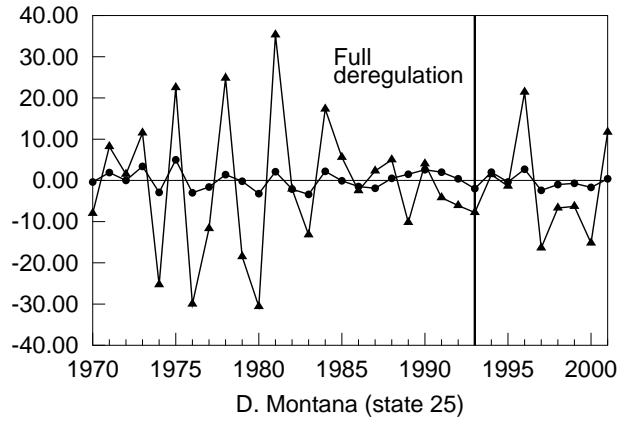
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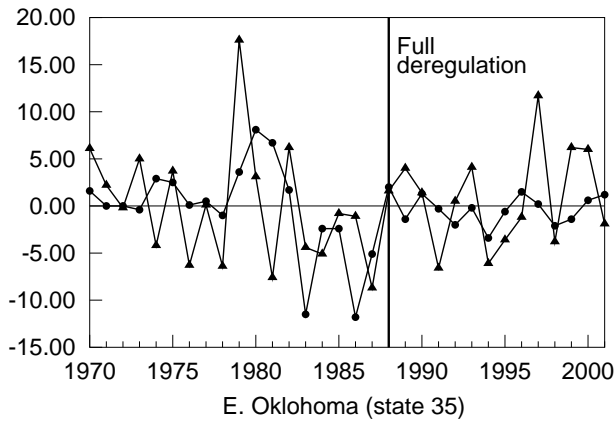
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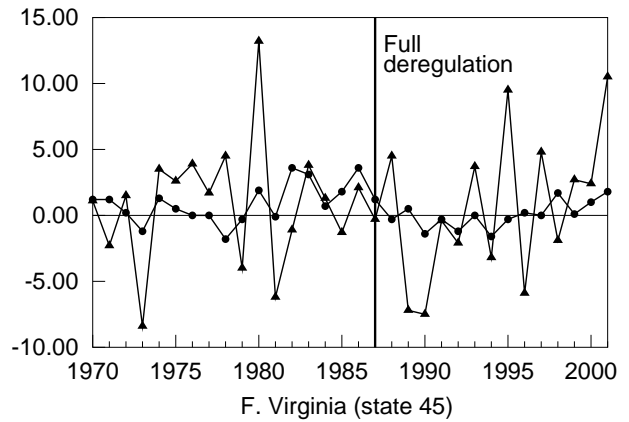
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gsp ● prop.inc. ▲

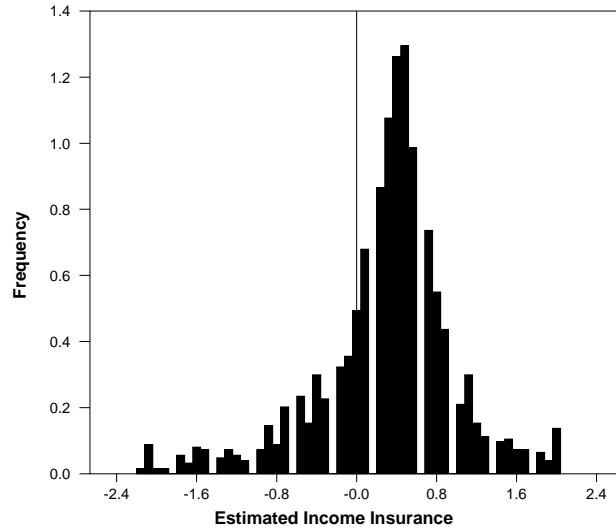


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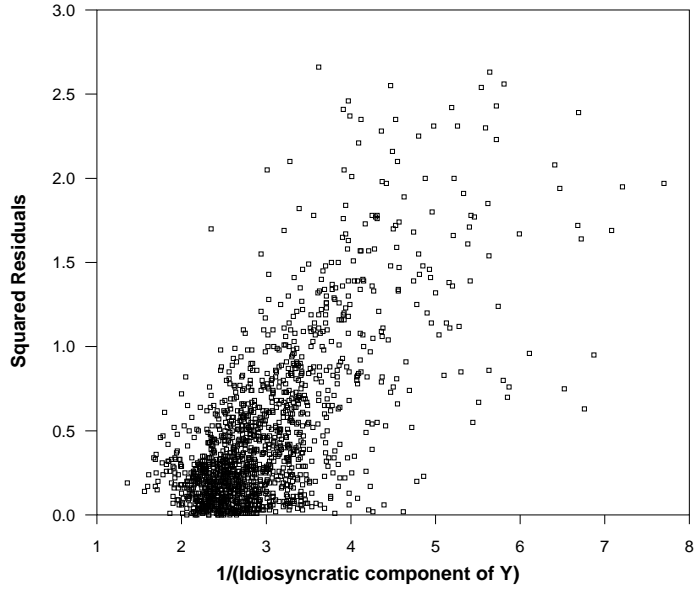
gsp ● prop.inc. ▲

Figure 4: Distribution of the Income Insurance Measure



Note: Income Insurance measures (personal) income insurance: $\text{sign}(\text{INS}_{it}) \cdot \ln(1 + |\text{INS}_{it}|)$, where $\text{INS}_{it} = 1 - \widetilde{\text{PINC}}_{it} / \widetilde{Y}_{it}$, $\widetilde{\text{PINC}}_{it} = \text{PINC}_{it} - \overline{\text{PINC}}_{.t} - \overline{\text{PINC}}_{.i}$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. PINC_{it} is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{\text{PINC}}_{.t}$ is the average of PINC across states in year t and $\overline{\text{PINC}}_{.i}$ is the average of PINC across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product.

Figure 5: Residual plot (“test” of heteroscedasticity)



Note: Residuals are taken from the following OLS regression: $INS_{it} = \alpha + \beta D_{it} + \epsilon_{it}$, where INS_{it} measures (personal) income insurance: $\text{sign}(INS_{it}) \cdot \ln(1 + |INS_{it}|)$, where $INS_{it} = 1 - \widetilde{PINC}_{it} / \widetilde{Y}_{it}$, $\widetilde{PINC}_{it} = PINC_{it} - \overline{PINC}_{.t} - \overline{PINC}_{.i}$, and $\widetilde{Y}_{it} = Y_{it} - \overline{Y}_{.t} - \overline{Y}_{.i}$. $PINC_{it}$ is (real) personal income (per capita) in state i in period t and Y_{it} is defined similarly using gross state product. $\overline{PINC}_{.t}$ is the average of $PINC$ across states in year t and $\overline{PINC}_{.i}$ is the average of $PINC$ across time in state i . $\overline{Y}_{.t}$ and $\overline{Y}_{.i}$ are defined similarly for gross state product.