Financial Integration and Growth: Banks' Previous Industry Exposure Matters[*]

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Abstract

We examine whether industry structure of an economy can be affected by its banks' lending policies. We use US interstate bank-entry deregulations to identify the effect of banking integration on states' manufacturing sector compositions. We find that states' under-specialized (with respect to the US) and external-finance-dependent industries grow faster upon entry of banks from states that are over-specialized in the same sectors. We observe growth for industry value added, gross operating surplus, and output per employee, but none for the number of employees, their compensation or wages. Our results are indicative of a banking channel shaping the states' industrial landscape. (100 words)

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1. Introduction

Over the past four decades states (countries) have become much more integrated financially, in many instances through out-of-state (foreign bank) entry. For example, banking deregulations in the US have led to the emergence of financial conglomerates that can now operate unhindered within the 50 states of the Union. A similar trend is also observed for the EU-member countries.[1] There is evidence suggesting that the effects of financial integration go beyond the simple provision of additional capital. For example, Morgan, Rime and Strahan (2004) find that there is synchronization of states' output fluctuations following integration through the banking sector. In fact, a number of papers point to a reallocation of capital across industries following financial integration (see Fisman and Love, 2004, for international evidence; Acharya, Imbs, and Sturgess, 2011, for the US; and Bekaert et al., 2013, for the EU). Yet, we know little about the micro mechanisms behind the macro-level evidence of the observed economic convergence that follows financial integration. The contribution of this paper is to explore the role of a particular channel in this reallocation process: industry-specific information collection and processing by financial institutions when providing capital to firms located in different markets that they enter. In other words, we examine whether financial integration can affect growth of various industries differently given the market-entrant financial institutions' previous exposure to the same industry.

More specifically, we test for a channel that works through commercial banks' exposure to over-specialized industries in their "home" state. Our conjecture is that financial integration through out-of-state banks that are more knowledgeable about an industry should lead to faster growth in that sector. We test this hypothesis using a series of quasi-natural experiments: staggered bank-entry deregulations at the state-pair level during 1980s and 1990s. We proceed as follows. First, we define the specialization of a manufacturing industry in a state as the ratio of that sector's share of manufacturing output (i.e., value added) to its share of overall US manufacturing output. An under-

[1] Evidence indicates that interregional banking integration leads to more firm formation (e.g., Cetorelli and Strahan, 2006), higher industry turnover (Kerr and Nanda, 2009), more interregional trade (Michalski and Ors, 2012), and higher industry growth (e.g., Bruno and Hauswald, 2014).

specialized (over-specialized) industry would have a ratio less (higher) than one.[2] Second, we presume that banks in a given state that is over-specialized in an industry would naturally lend more to that sector on average (compared to banks in states in which the same sector is under-specialized). Hence, prior to entering new markets these banks would have, on average, more information about the functioning and prospects of industries in which their state is over-specialized.[3] The information collected and processed by the banks in their (over-specialized) home state's more prominent industries would be reflected in their ability to screen and monitor loans in that sector (for ex., through the use proprietary credit scoring systems). Third, we conjecture that when these same banks enter a new market in another state for the first time (typically through the acquisition of a local bank in their "host" state post entry deregulation), their home-state industry exposure would give these lending institutions a natural advantage in screening loans. This informational advantage would arise, for example, through the sharing of proprietary credit scoring models with the acquired bank. We justify these steps using the related evidence from the literature (see Section 2 below). Finally, we test differential growth rates of under-specialized industries following their state's financial integration with banks from states that are over-specialized in the same sector.

To conduct our tests, we rely on the US data that have a number of clear advantages over cross-country studies. First, banking integration is shown to affect the real economy in the US (e.g., Morgan, Rime and Strahan, 2004, Cetorelli and Strahan, 2006, Kerr and Nanda, 2009, Rice and Strahan, 2010, Michalski and Ors, 2012). Moreover, during the years that we study, the banking sector forms roughly one-fifth to one-third of the US financial sector. So any effect that we observe is unlikely to be economically negligible. Second, US manufacturing firms operate in a single and fairly homogeneous economic and legal environment. As such, we do not have to worry about confounding effects (e.g., differences in legal systems as documented in La Porta, et al., 1997 and 1998, among

[2] It is standard to use such specialization indices to identify revealed-comparative advantage of regions or countries in regional economics or international trade studies. Our index adapts that of revealed comparative advantage proposed by Balassa (1965) to the context of U.S. state industrial production.

[3] Comparative advantage of local lenders is examined both theoretically and empirically in the literature. For example, in the Dell'Ariccia, Friedman, and Marquez (1999) model, asymmetric information between incumbent and entrant banks arises thanks to the information processing that is involved in granting prior loans to borrowers in the local market. Consistent with the hypothesis that local banks have lower information asymmetries, Bofondi and Gobbi (2006) find that Italian banks entering a new market have higher default rates than incumbents.

others) that cross-country studies have to deal with. Third, we concentrate our study on manufacturing industries that typically face US-wide competition, can organize their activities easily anywhere in the Union, are not subjected state-level barriers to entry, in principle have access to the same technology and inputs with similar quality, and whose output data are fairly homogenous across different sub-industries.[4] Finally, and very importantly, the use of the US data allows us to control for the endogeneity of lending institutions' entry: we can instrument banking integration thanks to the staggered interstate bank-entry deregulations that took place at different points in time for different state-pairs. Our empirical set up also controls for state- and industry-level unobservables that might vary over time, and uses the so-called system-Arellano-Bond estimator proposed by Blundell and Bond (1998) to account for the dynamic nature of our panel data.

The results are supportive of our hypothesis. We observe higher growth for under-specialized manufacturing industries in a given state when the state's banking system gets integrated with those of other states that are over-specialized in the same sectors. The observed effect is driven by the more external finance dependent manufacturing industries (as defined in Rajan and Zingales, 1998) in our sample. Moreover, our results are consistent with a better allocation of capital. The observed increase in under-specialized industries' output (value added) is due to higher return on capital and/or capital use (gross operating surplus). We also observe higher worker productivity (higher value added per employee). But we observe no statistically significant increase in the number of employees, total compensation of salaried workers, or wages per employee (as proxied by total compensation divided by the number of employees) in these sectors. Our findings exhibit reasonable magnitudes. We find, for example, that the increase of banking integration from zero to 1.2% (the average for the estimation sample) with the over-specialized states' banks leads to a 0.58% increase in the growth of value added over and above a comparable benchmark of the same under-specialized industry in the non-integrating states. We obtain similar results for the gross operating surplus (capturing the total

[4] This is not necessarily true for agriculture, mining or some service industries (e.g. electricity generation or shipping) where the natural endowment is decisive for the location choices. It is also not true for service industries (e.g. real estate, retail) where the local demand is important or various laws might limit industry growth (financial services being an example). Moreover, the capital intensity of the services sector is typically lower than that of manufacturing. Such considerations prevent conducting proper testing for the effects that we study in this paper for industries other than manufacturing.

remuneration of capital) and productivity (i.e., value added by employee). Our results are also intuitive in the sense that, in alternative tests, we find no statistically significant effect of bank integration when the banks entering a state also come from states that are under-specialized in the same industries or when we look at industries that are characterized by low external finance dependence in our sample. Moreover, these findings are robust to changes in the sample, estimation period, estimation method (OLS with IV versus Blundell-Bond with IV), and the fixed effects included in the regression.

We believe that these results are important because they provide evidence consistent with a micro-level channel for the macro-level evidence on industrial convergence provided by Kim (1995), and Dumais, Ellison and Glaeser (2002) in general, and as a result of bank branching deregulation by Acharya, Imbs, and Sturgess (2011) in particular. To the best of our knowledge, there are no papers on the sector-specific exposure of financial institutions and their industry-level impact following entry, with the exception of Bernstein et al. (2010) who provide international evidence of country-level industry growth following private equity firms' entry (we detail the differences between their paper and ours in Section 2 below).

The implications of our work go beyond academic curiosity. Our results suggest that the origins of institutions acquiring or merging with another economic region's banks can exert important influences on the industrial structure of the latter: banks, given their previous industry exposure, can play a non-trivial role in shaping industry structure of the economies that they enter. An acquirer from an economic region (state or country) that specializes in the automobile industry would have a potentially different and lasting imprint on the industrial structure (hence its future economic growth and industrial development) than an acquirer from an economic region (state or country) that specializes in the food industry.

The paper proceeds as follows. In Section 2 we review the literature important for our hypothesis. In Section 3 we detail the empirical approach and the data that we use. In Section 4 we present the main results. In Section 5 we discuss the robustness of our empirical findings and their economic relevance and consistency. Section 6 concludes.

2. Literature review

Our paper is related with different strands of the literature on financial integration and growth. First, our work is linked with the research on the growth of industries given the financial development of countries. Rajan and Zingales (1998) show that external finance dependent industries grow faster in economies with higher financial development. Wurgler (2000) finds that there is more (less) investment in growing (declining) industries in countries with more developed financial markets compared to states with a less developed financial sector. Fisman and Love (2004) find that industry growth across countries is more correlated for country-pairs with more developed financial sectors, which suggests that the financial sector, given its level of development, leads to similar shock responses across different countries. Following US interstate banking deregulations Cetorelli and Strahan (2006) find that the resulting higher banking competition is associated with the growth of small firms at the expense of large ones, whereas Kerr and Nanda (2009) document that small firm entry and exit (the so-called "churning" effect) increases. Bruno and Hauswald (2014) provide evidence that foreign bank-entry can have a positive effect on external finance dependent industries, whereas Behn et al. (2014) report that post financial liberalization industry growth depends on the interaction of domestic and foreign banks given the competitiveness of the local banking system prior to foreign bank-entry. One channel through which capital reallocation is taking place appears to be through improvements in firm productivity. Beck, Levine and Loayza (2000) find that country-level total factor productivity (TFP) growth is higher for countries that experience increases in private credit. Bertrand, Schoar, and Thesmar (2007) document that credit in France went to more productive firms following the 1985 removal of lending directives imposed on banking institutions, with deregulation leading to a change in allocations in the real economy. Using the removal of interstate *branching* deregulations of 1995, Krishnan, Nandy, and Puri (2015) find that TFP of small firms' increases following higher branching deregulation. In contrast to these papers, we show an industry's post-deregulation growth, including the growth of its productivity per worker, is affected by entrant-banks' prior exposure to that sector.

Our paper is also closely related with a smaller strand of the literature that examines the effects of financial integration across countries or states. Morgan, Rime, and Strahan (2004) find that banking integration across states helps smooth regional output fluctuations in the US while the risk of transmission of macroeconomic shocks across states increases.[5] Acharya, Imbs, and Sturgess (2011) observe that following the removal of interstate bank branching restrictions not only did the states' output volatility decreased, but that states' industrial portfolios started to converge towards a common US benchmark, with the effect being driven by sectors with a larger share of young, small and external finance dependent companies. In a similar vein, Bekaert et al. (2013) observe reductions in European intra-sector growth differentials following this economic region's financial (albeit through equity market) integration. Michalski and Ors (2012) show that integration of the real sector across regions follows financial integration: they find that the state-pairs that experience higher integration following pairwise interstate banking deregulations trade more compared to non-integrated states. The above-cited results on the reallocation of capital across sectors and regions (states or countries), suggest that banks' lending policies can affect the industrial landscape, especially so after important bank-entry deregulations. Little is known so far, however, as to the micro channels through which financial integration is affecting the industrial composition of economic areas.

One exception is Bernstein et al., (2010) who study the impact of private equity (PE) firms' entry into a country on the growth of industries the former specialize in. These authors examine growth rates of productivity, employment, and capital formation at the country-industry-level with international data covering 20 sectors in 26 large economies between 1991 and 2007. They find that following PE investment in a country, the industries in which these institutions specialize enjoy higher total production, value added, total wages and employment growth. While our results complement theirs, our paper differs from Bernstein et al. (2010) in many dimensions. First, we use the US interstate banking deregulations as a series of quasi-natural experiments to identify the industry growth effects of (potentially endogenous) financial integration through the banking sector. In our case financial integration between pairs of states could not increase before interstate banking deregulations became effective. This allows us to use a clear identification scheme that varies over time and state-pairs. In contrast, pinning down identification is much harder in an international setting

[5] Goetz and Gozzi (2013), who use finer state-pair as well as industry-level data and deregulations for identification (as in Michalski and Ors, 2012; and Goetz, Laeven and Levine, 2013), find results that are similar to Morgan, Rime and Strahan (2004) who rely on state-level deregulations.

as it is very difficult, if not impossible, to find exogenous changes that would generate strong instrumental variables. Without exogenous deregulatory events similar to ours, it is also more difficult in cross-country studies to account for the possible effects of other developments in the financial sector.[6] Second, during the period covered in our study the commercial banks' role in the US remains very important: 21.1% to 34.5% of the financial sector total assets in 1994 and 1985, respectively (Financial Accounts of the United States, 2014). Other segments of the financial industry were less influential during these years (and remain so in international settings even today). Importantly, in the US setting that we rely on, other segments of the financial sector (for example, investment banking) did not exhibit similar patterns of entry and integration for the same state-pairs during the same years. As such, we can clearly establish a causality running from banking integration to industry growth. Third, our US setting allows us to conduct counterfactual exercises by examining the growth of under-specialized sectors when banking integration takes place with states that are also under-specialized in the same industries. Such exercises allow us to rule out the possibility that our results are merely driven by statistical artifacts. Finally, we conduct a series of additional regressions and observe that our empirical results are robust. Moreover, a simple calculation exercise based on a Cobb-Douglas production model allows us to check the consistency of our various estimates with respect to each other. In the next section we review our approach for identifying the impact of banking integration on industry growth, define the empirical specification that we use, and provide information on the data and their sources.

3. Identification, empirical specifications, and the data

3.1. Identification

Before explaining the empirical strategy that we follow to test our conjecture, first we clarify the economic channels that are behind our hypothesis. We conjecture that under-specialized industries in a state would grow faster if their state experiences banking integration with other states in which the same sector is over-specialized. Our benchmark is the non-integrated states in which the same

[6] For example, Behn et al. (2014) use international data and find evidence of industry-level growth after major financial deregulations, which are typically followed by foreign bank entry. However, they do not examine whether foreign banks' pre-entry industry exposure plays a role in that sector's growth in the host country.

industry is also under-specialized. Then, we detail the potential and important problem of endogeneity that we face.

Our conjecture requires that industry-specific information (for example, in the form of proprietary credit scoring models, or transferring loan officers) be shared among banks belonging to a multi-bank holding company (MBHC):[7] i.e., that the sector-specific information flows from a member bank located in a state that is over-specialized in a particular industry, to another affiliated bank operating in a state that is under-specialized in the same industry. MBHCs play a central role in our story because following interstate banking deregulations, which we use to identify banking integration's effect, bank-entry took place through the acquisition of deregulating states' banks by out-of-state banking conglomerates.[8] In this setting, a natural way for information to flow within the expanding MBHC would be the sharing of proprietary credit scoring systems of previously separate banking entities.[9] Such information flows between banks of the same financial conglomerate are to be expected given evidence in the literature indicating that information sharing does occur across bank and non-bank subsidiaries of the same MBHC. For example, Gande, et al. (1997) show that during securities issuance, MBHCs fulfill a certification role in a way that is consistent with a flow of information from the commercial banks to investment banking (the so-called Section 20) subsidiaries of the same financial conglomerate. Similarly, examining the portfolio choices of mutual funds that are proprietary to MBHCs, Massa and Rehman (2008) find that the former significantly increase their investments in firms borrowing larger amounts from MBHC-affiliated banks, consistent with information flows from the banking subsidiary to the mutual fund subsidiary. Newer evidence on mutual funds by Luo, Manconi and Schumacher (2014) suggests that target (acquirer) funds start investing in sectors that the acquiring (targeted) fund used to invest in prior to the acquisition. More pertinently for our conjecture, Schumacher (2015) finds that when investing abroad international

[7] MBHCs were a common form of banking conglomerate in the US during the 1980s and 1990s.

[8] Banks were able to open new branches across state lines (if the host state allowed it) after the adoption of the 1994 Interstate Bank Branching and Efficiency Act (IBBEA, also known as the Riegle-Neal Act), which become effective in 1995. As the data available to us do not extend beyond 1997, we cannot exploit this legislative change, which, for example, Krishnan, Nandy, and Puri (2015) use to examine the effect of more bank finance on firms' TFP.

[9] For the role and importance of credit scoring systems in bank lending in the US refer to Frame, Srinivasan, and Woosley (2001), Akhavein, Frame, and White (2005), and Berger, Frame, and Miller (2005), among others.

mutual funds overweight the largest industry segments of their home countries (.i.e., the sectors they are more exposed to in their home country).

There is also another strand of the literature (Winton, 2000, and Stomper, 2006) that makes theoretical arguments for the sector-level specialization of banks in their lending.[10] However, the related empirical evidence to date is mixed.[11] That said, for our conjecture to go through we do not need banks coming from states that are over-specialized in certain industries to be specialized (or focused) in lending primarily to these sectors. The fact that these banks would have more information regarding these sectors (in which their state is over-specialized) *relative* to banks in their newly entered markets would suffice. In our story, the newly acquired bank would improve its lending with better screening through the additional sector-specific information provided by the acquiring-MBHC that operates in states that are overspecialized in the same sector. The information channel is especially pertinent for under-specialized industries that we focus on.[12] Next, we provide a discussion of the problem of endogeneity that we face in conducting our analysis.

Ideally, a direct test of our hypothesis would involve data on the sector composition of US banks' loan portfolios before and during the integration process: post-acquisition by MBHCs from states that are over-specialized in a sector, we should observe an increase in the segment-level lending

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[10] Winton (2000), studying the costs and benefits of lending diversification, provides theoretical arguments suggesting Modern Portfolio Theory-based lending may not be the optimal strategy if monitoring is costly and loans have important downside risk (i.e., it may pay off to specialize under certain conditions). Stomper (2006) suggests that industry-expert banks may extract rents that are proportional to the sector-specific risks that they take: this would lead to a banking market equilibrium in which certain banks specialize in lending to certain sectors, leading to a sector-level concentration in lending.

[11] Using Italian data Acharya, Iftekhar, and Saunders (2006) find that diversification of banks' industrial lending does not guarantee higher portfolio performance, suggesting that there may be benefits to specialization. Hayden, Porath, van Westernhagen (2007) find that lending to certain sectors generally increases loan portfolio performance, but not necessarily in the way anticipated by Winton (2000) or found by Acharya, Iftehar and Saunders (2006). More recently, Tabak, Fazio and Cajuerio (2011) use Italian data and find that industry-specialization leads to higher portfolio returns and lower risk. In a similar vein, Böve, Düllmann, and Pfingsten (2010) observe that specialization leads to better monitoring by German banks, whereas Jahn, Memmel, and Pfingsten (2013) find that these institutions' specialization reduces loan write-offs. In contrast, Beck and De Jonghe (2013) examine an international sample of large banks and find that sector-level specialization generates higher volatility and lower returns.

[12] We do not examine what happens to over-specialized industries when the banks entering the state after deregulation also come from states in which the same industry is over-specialized. Such integration is likely to have different industry effects. One can argue that the over-specialized banks' lending portfolio rebalancing and diversification motives could lead to less capital now being available to these over-specialized sectors. If so, these industries' growth can slow down. Dincbas and Ors (2015) provide preliminary evidence of more corporate M&As and divestitures following state-pair banking integration. It could well be that such industry reorganization would speed up following the integration of two states that are over-specialized in the same sector.

by the (acquired) banks in the state that is under-specialized in the same industry.[13] Unfortunately, such industry-level decomposition of bank lending is not available in the financial statements (the, so-called, Call Reports) that all the US commercial banks have to file with the federal regulators. Instead, we rely on state-industry-year level data and regress the annual growth rates of under-specialized industries on, among other variables, a test variable that captures state-and-industry-specific bank-integration with over-specialized states (more detail is provided in Section 3.2). However, such regressions would be biased and inconsistent if bank-integration would be endogenous to industry structure in general and industry growth potential in particular.

From one point of view, endogeneity is not likely to be a major concern: existing evidence on the political economy of interstate banking deregulation does not attribute a role to lobbying by non-financial industries (Kane, 1996 or Kroszner and Strahan, 1999). Even if non-financial industries were to play a role in interstate banking deregulations, it is improbable that the states' under-specialized (i.e., smaller) manufacturing sectors that we focus on would be the driving lobbying force for interstate bank-entry deregulation at the state legislature. Nevertheless, even if the deregulation process is not likely to be endogenous to the growth of under-specialized industry segments, some banks' entry decisions might be endogenous: at least some MBHCs' entry may have been driven by opportunities in lending growth. If so, our banking integration might be endogenous to the growth of industry segments.

This is where the staggered series of interstate banking deregulations provide us with a powerful identification tool at the state-industry-level through the use of instrumental variables approach similar to Morgan, Rime and Strahan (2004), Michalski and Ors (2012), and Goetz, Laeven, and Levine (2013). Because both our bank integration variable and the IVs vary at the state-industry-year-level, we can identify the impact of integration of a state's banking system with those located in states that are over-specialized in an industry.

[13] We know of no evidence to date on post bank-acquisition portfolio convergence for commercial and industrial loans at the industry level. That said, there is limited anecdotal (e.g., Wall Street Journal, 1996) and empirical (e.g., Zarutskie, 2013) evidence of portfolio harmonization across loan categories for banks (i.e., business loans, real-estate loans, personal loans, etc.).

Finally, interstate banking deregulations also allow us to come up with the proper counterfactuals to rule out the possibility that our regressions are merely picking up spurious correlations. If the information channel we have in mind would hold true, then we should observe *no* effect when a state that is under-specialized in certain industry segments would find its banking system integrated with banks of other states that are also under-specialized in the same industry. This is exactly what we find: if a state ends up with more banking links with states that are under-specialized in a given industry, that sector does not experience higher growth. Put differently, such integration provides no additional benefits in terms of information flows, loan screening and monitoring for the concerned industry.

3.2. Empirical specifications

Before describing the empirical challenges that we face, and introduce our regression specification, we describe the dependent and test variables that we use. To construct our dependent variables, we first classify the 19 two-digit SIC manufacturing industries in each state, for which we have data available, into two groups: under- versus over-specialized sectors.[14] We focus on the growth of output-related variables for the under-specialized industries in each of the 48 contiguous states.[15] Additionally, we also (but separately) classify sectors based on whether they consistently (i.e., for all the years in our sample) rank among the most- (or least-) specialized three industries in each state. This gives us two set of states (most- and least- specialized) for each industry. This second classification scheme is used in the process of creating state-industry-year level banking integration variables to identify the effect banking integration with the set of states that are the most specialized in that industry.

To construct our test variable, which is banking integration between a state and a group of other states, we use the following procedure. First, in each year we calculate the state-pair banking

[14] As explained in Section 3.3 below, the number of manufacturing industries (19) with which we can work is imposed on us by the publicly available version of the Census data as provided by the Bureau of Economic Analysis (BEA).
[15] We exclude Alaska, the District of Columbia, and Hawaii from our sample: The District of Columbia and Hawaii have very small manufacturing sectors whereas Alaska's manufacturing sector is mostly endowment (energy) driven (by oil and natural gas).

integration as the sum of common banking assets belonging to MBHCs headquartered in either of the two states divided by the total of all banking assets in both states (banking assets of either state's MBHCs that are located in other states are not taken into account in this calculation). In a second step, for each under-specialized industry in a given state, we sum that state's banking integration with the states where the same industry ranks consistently among the top three most specialized industries throughout the 1982-1995 period.[16] This variable (*INTEG_WITH_3_MOST*) captures, for a given state and industry and on an annual basis, the potential information advantage that integration with banks located in states that are over-specialized in that industry provides.[17] Similar to *INTEG_WITH_3_MOST* described above, we also construct a banking integration variable that captures integration with banks that would potentially be the least exposed to an industry by summing the state's banking integration with the states where the same industry ranks consistently among the bottom three least specialized sectors (*INTEG_WITH_3_LEAST*). Given the way we construct these two variables, any two states, for example California and Michigan, will have different banking integration measures for each of the manufacturing sectors. For the "Motor vehicles and equipment" industry, the resulting banking integration of California with Michigan will be important because this is the industry in which Michigan is the most specialized state in the period we are interested in. For California's "Chemicals and allied products" industry, however, banking integration with Michigan will take into account the fact that this sector is consistently among the least specialized industries in Michigan. Consequently, we expect the California's banking integration with Michigan to have a beneficial impact on the automotive industry but not for the chemical industry in California. Such

[16] We choose number of three for the most- and least- specialized industries for the following reasons. We would like an industry to be consistently among the top specialized ones throughout the sample period. If we restrict our attention to only one industry per state we would miss many states as (and especially for large, diversified states) the most-specialized industry changes over the years. If instead we were to be say ten industries (out of the available 19) per state, then our banking integration would include at least some states that are in fact under-specialized in the same sector in some of the years given the limited number (19) of two-digit SIC manufacturing segments available to us in the publicly available Census data. As a robustness check, we also present our results when we select five most-specialized states in Table 8.

[17] An alternative formulation based, for example, on the ranking of the specialization of states in each industry and selecting top three states most-specialized according to that ranking, suffers from the following flaw: the states with the highest specialization rankings are typically small states with small banking industries. For example, the highest specialization index (23.37) in our sample was for the leather and leather products manufacturing in Maine. We do not want such special cases to be the drivers of our empirical testing. In a robustness check, we repeat our analysis after dropping the five smallest states by gross state product.

variations in state-pair banking integration across different sectors of a given state are at the heart of our identification scheme.

For a better understanding of the source of variation of our test variable at the state-industry-level, Fig. 1 provides a series of graphs that depict the number of deregulating state-pairs across the years and given different industries. In the uppermost left-hand-side graph, we provide the overall number of effective state-pair deregulations that took place across the years between 1982 and 1995.[18] In the other cells, for each industry, we chart the number of effective state-pair deregulations provided that the given sector was under-specialized in one of the states and was among the top-three over-specialized segments in the other. Looking at these 19 graphs, it is easy to see that the effective banking deregulations across state-pairs show a lot of variation across industries. Our state-pair banking integration variable follows a similar pattern at the industry level.

As explained above, because bank entry (hence banking integration) is considered to be endogenous to the growth potential of industries (because it provides better lending opportunities for, at least, some banks) we resort to IV-estimation. For *INTEG_WITH_3_MOST* (or *INTEG_WITH_3_LEAST*) we use as instruments the sum of average years passed since the *effective* deregulation of the host state with each of the most- (least-) specialized states -- *YEARS_DEREG_3_MOST* (*YEARS_DEREG_3_LEAST*) -- and the square root of years passed since the beginning of integration with most- (least-) specialized states -- *FIRST_DEREG_3_MOST* (*FIRST_DEREG_3_LEAST*).

Besides endogeneity, we face two additional and related empirical challenges. One potential concern is mean-reversion in our dependent (state-industry growth) variable. Relatively smaller industries in a state (i.e., the ones in which the state is under-specialized) are likely to grow faster than the larger ones (i.e., sectors in which the state is over-specialized). More established industries might

[18] Effective deregulation date refers to the first year in which actual entry can occur. A state's interstate bank-entry deregulation is typically a necessary but not sufficient condition for actual entry. Interstate banking deregulation could occur on a reciprocal or non-reciprocal basis. Initially, most interstate banking deregulations were on a reciprocal basis, meaning that the initially deregulating state would nevertheless require that the counterparty state also allows the former's banks to enter the latter's market. Eventually, states started to deregulate on a non-reciprocal basis, either regionally or nationally. Our initial deregulation date for a state is the very first of all possible effective deregulation years. We measure under- or over-specialization as of this date and it remains constant for the rest of the sample period for a given state.

eventually stagnate and experience slower or even negative growth. Moreover, state or US-wide business cycles could exacerbate such effects. One way to account for the potential mean-reversion, which is mainly associated with the growth cycle of the industry, is to use another (contemporaneous or lagged) variable that is indicative of the segment's size in the state's economy, such as the value added share of the industry (as in Cetorelli and Gambera, 2001, or Cetorelli, 2004) or its labor share (as in Cetorelli and Strahan, 2006). However, in our case the dependent variable is state-industry-level growth, which is likely to be affected by the value added or labor share of the sector.[19] Put differently, industry value added or labor share are likely to be endogenous to the growth of that segment. The second concern that we face is persistence in the variables. For example, introducing lagged labor share of the segment as a control variable to handle mean reversion would provide little relief if the sector-level growth measures are persistent. In other words, we face concerns that are due to the dynamic panel nature of our study. As a result, we use the lags of our dependent variables to control for mean-reversion and persistence.

The final issue that we need to take into consideration in this dynamic panel setting is the fact that we would also like to control for the unobservables with industry-time and state-time fixed effects. The problems cited in the previous paragraph would be exacerbated by the fact that including a large number of fixed effects in dynamic panel models can lead to biased and inconsistent estimators, especially for "small *T*, large *N*" panels (Nickell, 1981). Judson and Owen (1999) state that the bias is inversely related to panel length *T*, since the effect of idiosyncratic shocks will decay overtime. Given that our data panel has moderately few time periods (T=16) but large *N* (with a maximum of 912 observations in each year for 19 manufacturing industries in 48 states) our regressions are potentially prone to "dynamic panel bias".

Under such conditions, the Arellano-Bond (AB) estimator (following Arellano and Bover, 1995, and Blundell and Bond, 1998), which relies on the generalized method of moments (GMM), provides a solution for the efficient estimation of dynamic panels. This estimator corrects for the

[19] This issue is not a primary concern for the cited papers. The empirical analysis in Cetorelli and Gambera (2001) is cross-sectional (and does not have a time-series component). In Cetorelli (2004) and Cetorelli and Strahan (2006) the dependent variable is the (level of) number of firms or average firm size in an industry: it is not obvious that a (relative to the rest of the economy) stagnating industry's number of firms or average firm size would shrink as the overall economy continues to expand on average.

endogeneity of the lagged dependent variable (which is introduced to control for its persistence or mean-reversion) and provides consistent parameter estimates even in the presence of endogenous right-hand-side variables (in our case, the bank-integration variable). It also allows for fixed effects, heteroskedasticity and autoregressive (AR) error terms. Since our dynamic panel exhibits all of these characteristics we use the Blundell and Bond (1998) system-GMM (BB) estimator for dynamic panel data. We do this because system version of the AB estimator involves first-differencing of the regression equation of interest and building a system of two equations -- the original equation and the transformed one -- an approach that provides more suitable instruments (e.g., Roodman, 2009) for our lagged dependent (growth) variables.[20, 21]

Consequently, we estimate the following dynamic panel model of state-industry level growth:

$$\Delta \ln\left(Y_{i,s,t}\right) = INTEG\_WITH\_3\_MOST_{i,s,t} + \sum_{j=1}^{J} L(j).\Delta \ln\left(Y_{i,s,t}\right) + \gamma_t + \gamma_{i,t} + \gamma_{s,t} + e_{i,s,t} \qquad (1)$$

where, Y is the industry-state output variable; $\Delta ln(Y_{i,s,t})$ is the growth of Y defined as $ln(Y_{i,s,t}) - ln(Y_{i,s,t-1})$; i,s,t refer to industry i in state s in year t, respectively; $INTEG\_WITH\_3\_MOST_{i,s,t}$ is the banking integration of state s that is under-specialized in industry i with other states where the same industry ranks consistently among the top three most specialized industries throughout the sample period; $L(j)$ is the j[th] lag of the dependent variable; γ_t, $\gamma_{i,t}$, and $\gamma_{s,t}$ are year, industry-year, and state-year fixed effects, respectively; and $e_{i,s,t}$ denotes the error term.

When using the system-AB estimator, we need to (i) select the autoregressive lag structure J and (ii) decide on the number of instruments to use for the lagged dependent variable. Regarding the first problem, we cannot rely on the same lag structure for all of our regressions due to a number of reasons. First, we have six different dependent variables of state-industry-level growth based on the publicly data available through BEA (please refer to section 2.3 below for more details). These six dependent variables exhibit empirically different autoregressive (AR) patterns. Second, these growth rates' dependence on past realizations vary, for example, due to dependence on external finance or

[20] For a similar application of system-GMM proposed by Blundell and Bond (1998) to country-level growth rates see Beck, Levine and Loayza (2000) as well as Levine, Loayza and Beck (2000), and to (external finance dependent) industries' growth rates see Bruno and Hauswald (2014).
[21] In a horse race of methods used in estimating dynamic panel models used in corporate finance research with panel data, Flannery and Hankins (2013) recommend for practical applications a system-GMM over alternative estimators.

these sectors' specializations in a given state. As a result, assigning the same default number of lags *J* to all of our regressions would be problematic: putting too few lags may lead to AR errors that render the regression not be properly specified leading to inconsistent estimates. Hence, we look for a specification that fits the AR pattern of each dependent variable in the most parsimonious way possible. We achieve this by making use of the Arellano-Bond serial autocorrelation tests applied to the residuals in the differenced equations. As a rule, in our baseline model we use the specification with the minimum number of lags and with AB-autocorrelation test p-values that do not reject the null hypothesis of no serial correlation at least at the 10%-level for up to third-order serial correlation.

Regarding the second choice, we need to determine the number of instruments that are used for the lagged dependent (growth) variable bearing in mind that the system-GMM estimator can generate a large number of moment conditions that need to be satisfied. As a result, the instrument count is quadratic in the time dimension *T*. One consequence is that the variance-covariance matrix, if it were to consist of large number of resulting moments, would not be well estimated by a finite sample of the data. Additionally, a large number of instruments may over-fit endogenous variables and weaken the power of Hansen test for over-identification (e.g., Roodman, 2009).[22] Unfortunately, there is no guidance from the literature as to how many instruments is "too many" (e.g., Roodman, 2009). We use up to five lags of the dependent variable, which is the difference of the logarithm of output and its lag, as instruments for itself. Unfortunately, our specification suffers from too many instruments problem, not through the instruments of lagged dependent variables, but through the instruments of the large set of fixed effects we employ to absorb time varying state- and industry-level unobservables. Therefore, as a robustness check we run the specification with fewer fixed effects (where we keep year- and industry-year fixed effects, but replace 672 [=48×14] state-year fixed effects with 48 state fixed effects) and collapsing the instrument set to a single column. Reassuringly, our results hold in these regressions where we typically obtain reasonable statistics for the Hansen test of over-identification (which is a test on the validity of the instruments).

[22] With too many instruments the Hansen test generates a perfect test statistic of 1.

3.3. The Data

To construct our database we rely on two separate sources. First, we use annual Bureau of Economic Analysis (BEA) estimates of state-and-industry output variables. The benefit of the BEA data is that they help us assess the overall economic impact of banking integration on 19 industrial segments (as opposed to the overall state-level output growth).[23] The downside is that state-industry-level value added, which is equal to state-industry level Gross State Product (GSP), is a BEA estimate based on industry-level US Census Bureau data.[24] Nevertheless, we use BEA's manufacturing segment-level aggregate data, as they are the only publicly available state-industry-year level data that can be obtained. Second, we use BHC and commercial bank financial statements to calculate the banking integration variable across state-pairs. These data come from the financial statements (the so-called Call Reports and Y-9 forms) that all US banks and BHCs have to file with their federal regulators.[25]

We use 1963-1995 BEA data to provide Eq. (1) estimates for 1982-1995 (the difference is due to the lag structure we choose for the system-AB estimator). We start in 1982 for two reasons. First, we do not have BHC structure (i.e., membership) data prior to 1981.[26] Second, even though Maine was the first state to deregulate bank-entry into its market in 1978, its actual (effective) deregulation did not start until 1982 when New York reciprocated. We end our estimation in 1995 because the IBBEA, which took effect in September of that year, leveled the playing field in interstate banking at the federal level (i.e., for all states) by allowing banks to consolidate their activities into a single corporate charter and allowing them to enter new markets by opening new branches (if the states allowed such branching entry). This federal deregulation weakens using our state-pair based

[23] An alternative source of data, available from the Annual Survey of Manufacturing (ASM), and containing the more data, proved to be unsuitable for our investigation. First, the publicly available version of ASM contains too many zeros (due to non-disclosure rules that require that data be suppressed if it were to reveal or hint at the identity of the participating firms) introducing gaps in a panel setting, something that severely limits the sample size that we could investigate. Second, the ASM data start in 1982 (in contrast to BEA data that start in 1963). These two features matter crucially when the estimation requires dynamic panel techniques with lagged variables as instruments.

[24] GSP is the state-level equivalent of the country-level Gross Domestic Product (GDP).

[25] These are the Federal Reserve System, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation.

[26] Even though the individual bank financial (the so-called Call Report) data are publicly available since 1978, the BHC (Y-9) data are publicly available starting with 1986 only. We supplement the latter with the so-called BHC structure (membership) data for 1981-1985 that we obtained from the Federal Reserve Board of Governors. We could not find BHC structure data for years prior to 1981.

identification strategy when extending the estimation period beyond 1995. Nevertheless, we also estimate Eq. (1) for the 1982-1997 period (using 1978-1997 data) as a robustness check. But this exercise cannot go beyond 1997 because of changes in the industry classification standards.[27]

In Table 1, we provide information on the manufacturing industries, their external finance dependence status, and their distribution as under- and over-specialized sectors of activity across states. The first three columns of Table 1 list the names of the 19 manufacturing industries covered in the study, their BEA identifiers as well as the corresponding two- or three-digit SICs. In the fourth column of Table 1 we indicate the nine industries that we classify as more external finance dependent as they are the median of the measure proposed by Rajan and Zingales (1998).[28] In column five (seven) of Table 1, we observe that an industry is classified as under-specialized (over-specialized), i.e., with a specialization index below (above) one, in 31.1 (16.7) states on average. There is variation on this dimension across industries: an industry can be under-specialized (over-specialized) in 24 to 40 (8 to 24) states. The number of states in which an industry ranks consistently among the top (bottom) three most (least) specialized sectors is equal to 4.7 (4.1) on average, ranging from 2 to 10 (0 to 21) states per sector.

Table 2 provides the summary statistics for the variables that we use, based on the publicly available data that we have at our disposal. We have six dependent variables as measures of state-industry-level growth. Value added (*VA*) is equivalent to state-industry-level GSP. Gross Operating Surplus (*GOS*) is the return to the capital employed in the industry at the state level. Compensation of employees (*COMP*) is the total of disbursements to industry's employees (including wages plus retirement and similar contributions made by the employers). It should be noted that *GOS* and *COMP* are the two main components of *VA*. The number of employees (*EMP*) at the state-industry level includes both full- and part-time employees (without a full-time equivalent adjustment unfortunately).

[27] In 1997 the US Census Bureau (and hence the BEA) have switched from the Standard Industry Classification (SIC) to the North American Industrial Classification System (NAICS). Even though there is a concordance table between the two systems at the four-digit level, there is no way to match these two classifications at the two-digit level, which is the detail level for the publicly available version of the BEA data that we use.

[28] To do this, we use firm-level variables in COMPUSTAT universe and compute the average value of each firm's external financing needs for 1982-1995, which is calculated by subtracting cash flows from operations from total capital expenditures and then dividing it by total capital expenditures. Next, we aggregate the firm-level ratios of external financial dependence using the median value for all firms in each BEA industrial classification category.

Productivity (*PROD*) is measured as value added per employee at the state-industry level. Similarly, wages (*WAGE*) is gross compensation per employee at the state-industry level. In Section 5.2, we provide a simple Cobb-Douglas production model and show how these six variables are linked with each other.

In Table 2, we observe that for industries that are classified as under-specialized at the state-level the annual growth of *VA* is 5.5% on average, that of *GOS* 6.2%, *COMP* 4.9%, *EMP* 0.9%, *PROD* 4.5%, and *WAGE* 4.0%. The somewhat sizeable standard deviations observed in Table 1 for some of these growth rates are due to the fact that we are dealing with relatively small industries (which are under-specialized) whose growth can change by large values year-to-year if (relatively) few establishments are launched or closed. The average banking integration of states in which industries are classified as under-specialized with those states in which the same industries are consistently classified among the top-three most-specialized industries during the sample period (*INTEG_WITH_3_MOST*) is equal to 1.2% of common banking total assets. The average banking integration of states in which industries are classified as under-specialized with those states in which the same industries are consistently classified among the bottom-three most-specialized industries during the sample period (*INTEG_WITH_3_LEAST*) is equal to 2.2% common banking total assets. Importantly, we do not observe discrepancies in either banking integration or our instruments for integration with the most- and least-specialized states; *a priori* there is no difference in the timing or depth of integration with these two sets of states. The state level industry specialization index for the top-three most-specialized industries (*SPEC_3_MOST*) has an average of 3.69, whereas that for bottom-three least-specialized industries (*SPEC_3_LEAST*) has an average of 0.13. The number of states that are identified as most-specialized for a particular industry (*NUMBER_3_MOST*) has a mean of 5.49 states, and ranges between 2 to 10 states. This suggests that for a state-industry-year observation there are anywhere between 2 to 10 states that have the same industry consistently in the top-three most-specialized industries throughout the sample. In contrast, the number of states that are identified as least-specialized for a particular industry (*NUMBER_3_LEAST*) has a mean of 2.35 states ranging between 0 to 21 states. This suggests that for a state-industry-year observation there may not be any state that has the same industry among its bottom-three least-specialized industries throughout the sample, though another industry may be in that category for up to 21 states.

4. Main results

Our main results are provided in Tables 3 through 6. Note that our empirical models capture short-run adjustments, i.e., transitory changes in growth rates in the year following integration, with hiring and wage-setting decisions that can be further spread over time.

In Table 3, we provide the estimates of Eq. (1) using variables for banking integration of state *s* that is under-specialized in industry *i* with the states that have the same industry *i* among their top-three (bottom-three) most-specialized (least-specialized) industries throughout the sample period. In column 1 of Table 3, we look at the growth of state-industry-level *VA*. The coefficient estimate of *L1.INTEG_WITH_3_MOST* is equal to 0.3170, which is statistically significant at the 10%-level. If the banking integration (with states in which one industry would rank among the three most specialized) would increase by one standard deviation (which is equal to 0.024, that is, 2.4%), the growth of the sector would increase by 0.76% (=0.3170×0.024) over-and-above comparable industries in states whose banking systems were not integrated. In the next three columns, the coefficient estimates of *L1.INTEG_WITH_3_MOST* for *GOS*, *COMP* and *EMP* are all positive but statistically insignificant: industry-level growth of *GOS*, *COMP* and *EMP* do not appear to be affected by their state's integration with those that are over-specialized in the same sector. In the before-last column for growth of *PROD* the coefficient estimate of *L1.INTEG_WITH_3_MOST* is equal to 0.3201, which is statistically significant at the 10%-level. A one standard deviation increase in banking integration (with the states in which the same industry is among the top-three most specialized) leads to a 0.77% (=0.3201×0.024) additional increase in productivity growth. Similarly, in the last column for growth of *WAGE*, the coefficient estimate of *L1.INTEG_WITH_3_MOST* is equal to 0.1433, which is statistically significant at the 5%-level. A one standard deviation increase in banking integration is associated with a 0.34% (=0.1433×0.024) growth in wages per employee. These first results suggest that manufacturing industries, which are under-specialized in a particular state, enjoy higher growth in value added, productivity (value added per employee), and wages (compensation per employee) if that state's banking sector becomes integrated with those of other regions that are over-specialized in the same sectors.

However, there may be differences across industries that we do not account for when we pool all 19 industries together. Given Rajan and Zingales (1998) findings, it is natural to think that industries with higher external finance dependence (EFD) might benefit more from the industry-specific information flow induced by the banking integration across state borders. Put differently, if our conjecture is true, we should observe stronger results for high-EFD manufacturing industries and weaker results for low-EFD industries. To test for these possibilities, we use the industry-level measure of external finance needs developed in Rajan and Zingales (1998) and divide our sample into two mutually exclusive subsets. The first subset contains nine industries that exhibit higher EFD in our sample, while the latter contains ten industries that have relatively low EFD in our dataset.

In Table 4, we estimate Eq. (1) separately for the nine high EFD sectors and present the results in the same format as Table 3. In column 1 of Table 4, in which the dependent variable is the growth of industry-level VA, the coefficient estimate of *L1.INTEG_WITH_3_MOST* is equal to 0.6978, which is statistically significant at the 5%-level. This finding suggests that if banking integration of a state in which a particular high-EFD industry is under-specialized were to increase by one standard deviation (which is equal to 0.021, or 2.1%, in this subsample), the growth of the industry would increase by an additional 1.47% (=0.6978×0.021) per year (compared to the growth of the same under-specialized segment in states that experience no such integration). This finding suggests that the average growth in the sample (which is 5.5% per year) would increase by almost one-fourth. Moreover, this observed increase for under-specialized high-EFD industries appears to be driven by the growth of *GOS* (remuneration of capital) and not *COMP* (compensation of employees). For *GOS*, the coefficient estimate of *L1.INTEG_WITH_3_MOST* is equal to 3.1458, which is statistically significant at the 5%-level: a one standard deviation increase in banking integration (as defined above) would lead to an additional growth of 6.61% (=3.1458×0.021). For *PROD*, the coefficient estimate of *L1.INTEG_WITH_3_MOST* is equal to 0.9107, which is statistically significant at the 5%-level: a one standard deviation increase in banking integration (as defined above) would lead to an additional growth of 1.91% (=0.9107×0.021). The coefficient estimates of

L1.INTEG_WITH_3_MOST in the *COMP*, *EMP* and *WAGE* regressions are not statistically significant in Table 4.

In Table 5, we conduct the same exercise for the ten low-EFD under-specialized industries in our sample. All of the *L1.INTEG_WITH_3_MOST* coefficient estimates (with the exception of *GOS*) are positive, but none of them (including the one for *GOS*) are statistically significant. In Table 6, we examine the growth of high-EFD under-specialized sectors in a given state if the banking integration takes place with other states in which the same industries are among the bottom three least specialized sectors in that state. None of the coefficient estimates for *L1.INTEG_WITH_3_LEAST* are statistically significant in Table 6. We conclude that the results of Table 3 are driven by the high-EFD under-specialized sectors in states whose banking systems are integrated with those of states that are over-specialized in the same manufacturing segments. Consequently, we conduct the rest of our analysis with this sample of high-EFD industries that are located in states in which they are under-specialized.

The interpretation of the results in Table 3 through 6 is straightforward. Industries that are high-EFD and which are classified as under-specialized as of their state's initial deregulation date grow faster after the integration of state's banks with institutions from other states that are over-specialized in the same manufacturing segments. These results are obtained after taking into account (i) potential mean-reversion in sector-level growth, (ii) autocorrelation (and persistence) of growth measures, (iii) any industry-year specific effects (like productivity shocks or U.S.-wide demand shocks), (iv) any state-year effects (such as changes in state economic conditions), and (v) potential endogeneity of the banking integration. Furthermore, the results of Table 4 indicate that the observed growth for value added is driven by a higher remuneration of capital (*GOS*) as opposed to growth in sector-level compensation (*COMP*) -- driven by changes in employment or wages. These findings suggest, in broad macroeconomic terms, either that the productivity of capital increases (for example, because of better capital allocation within the industry), or more of it is productively employed (through more investment), or that production becomes more capital intensive (capital substitutes labor), or capital is more rewarded, or all of the above. Unfortunately, the data from the publicly available sources that are at our disposal do not allow us to discern between the sources of the observed growth because they are not at a finer (for example, at the firm) level. In the next section first we check the robustness of the empirical results above. Then we evaluate the sizes of our coefficient estimates with respect to each other through the lens of a calculation exercise that is based on a Cobb-Douglas production function.

5. Checks on the consistence and robustness of the results

5.1. Checks on the robustness of the empirical estimates

In tables 7 through 10, we conduct a series of additional estimations to verify the robustness of the results we observe in Table 4. First, we check whether expanding the estimation window from 1982-1995 to 1982-1997, in order to include two additional years of data beyond the implementation of IBBEA, yields similar results. The results in Table 7 suggest that this is the case. The coefficient estimate of *L1.INTEG_WITH_3_MOST* is equal to 0.6961 for *VA* (statistically significant at the 5%-level), 2.4626 for *GOS* (statistically significant at the 10%-level), 0.6756 for *COMP* (statistically significant at the 10%-level), 0.2810 for *EMP* (statistically insignificant), 1.0761 for *PROD* (statistically significant at the 5%-level), and 0.1756 for *WAGE* (statistically insignificant). In other words, our results remain when we take into account the federal bank-entry deregulation that took place beyond 1995 (when all states deregulated inter-state bank entry, something which weakens the variation in our instruments). We cannot expand the sample beyond 1997 as data by SIC categories are no longer produced by the Census Bureau (and hence the BEA) past that year.

Next, we check whether our results may be driven by smaller states that tend to have more specialized economies and hence more under-specialized industries. In Table 8, we repeat Table 4 regressions after dropping the five smallest states (which are Montana, Nevada, North Dakota, South Dakota and Wyoming) in terms of manufacturing GSP in 1982. The coefficient estimates for *L1.INTEG_WITH_3_MOST* for the six dependent variables are very similar in terms of size and statistical significance to those observed in Table 4: 0.7237 for *VA* (statistically significant at the 5%-level), 3.2323 for *GOS* (statistically significant at the 5%-level), 0.2011 for *COMP* (statistically insignificant), 0.0101 for *EMP* (statistically insignificant), 0.9147 for *PROD* (statistically significant at the 5%-level), and 0.0663 for *WAGE* (statistically insignificant).

In Table 9, we expand the set of industries in which a state can be over-specialized from three to five. In other words, we examine the impact of integration of a state's banks on the growth of its under-specialized sectors when the banks entering the state after deregulation come from states in which the same industries are among the top-five most specialized.[29] The coefficient estimates of *L1.INTEG_WITH_3_MOST* for *VA* (0.5938), *GOS* (1.997), and *PROD* (0.7908) are very similar to those in Table 4 in terms of size but also statistical significance (all three have p-values below the 5%-level). The coefficient estimates of *L1.INTEG_WITH_3_MOST* for COMP and *EMP* are also similar in the sense that they are statistically insignificant from zero. The only difference is the coefficient estimate for *WAGE*, which is now equal to 0.2501 and statistically significant at the 10%-level. A one standard deviation increase in banking integration (with states in which the same industry is among the top-five most specialized) leads to an additional growth of 0.53% (=0.2501×0.021) in wages per employee.

In Table 10, we re-run the regressions in Table 4, but we limit ourselves to 48 state fixed effects (rather than 672 state-year fixed effects as in Table 3) while maintaining industry-year and year fixed effects. We do this in order to check on the validity of our instruments through the Hansen test: the joint-null hypothesis underlying this over-identification test is that (i) the exogenous instruments are valid and (ii) the imposed exclusion restrictions for the instruments are correct. With too-many instruments the Hansen test of over-identification cannot be rejected in practice, yielding a perfect p-value of 1. In the regressions presented in Table 10 the coefficient estimates of *L1.INTEG_WITH_3_MOST* for *VA*, *GOS* and *PROD* (0.8533, 3.7534, and 0.7751, respectively) are similar to those presented in Table 4, albeit only statistically significant at the 10%-level. In Table 10 coefficient estimates for *COMP*, *EMP* and *WAGE* are statistically insignificant, as in Table 4. Importantly, the Hansen test (for which the null hypothesis is that all over-identified instruments are exogenous) cannot be rejected in any of the columns of Table 10: this suggests that we have valid set of instruments for our dynamic panel IV setting that relies on the BB estimator.

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[29] We do not look at higher number of most-specialized industries (say, seven or eight most specialized). This is due to the limited number of two-digit SIC industries for which we have available data: with 19 industries at our disposal, as the number of most specialized industries increases, certain segments fail to meet our requirement that their specialization indexes should be consistently above one throughout the sample period.

In additional appendix tables, we use pooled-OLS and panel fixed effects (Within) estimators without and with IV in order to compare them with the results we presented in Table 4 with the BB estimator. Such comparisons are typically done to check the validity of the AB estimates for the *lagged dependent variables* (which are *not* the focus of our analysis). This is because the fixed effects estimators provide downward biased coefficient estimates whereas those of OLS are upward biased, with the correct AB estimates for the *lagged dependent variables* lying somewhere in between. In Appendix tables A1 (Within estimator) and A2 (GMM-2S-IV estimator) the lagged dependent variable's coefficient estimates are typically smaller than the corresponding estimates of Table 4. As an example, in Table 4, *L1.VA* coefficient estimate is equal to -0.0069 (statistically insignificant). The corresponding *L1.VA* estimates are respectively -0.0835 and -0.0839 in tables A1 and A2, respectively (both of which are statistically significant at the 1%-level). In Appendix tables A3 (pooled-OLS) and A4 (pooled-OLS with IV), the lagged dependent variable's coefficient estimates are typically larger than the corresponding estimates of Table 4. In tables A3 and A4, the coefficient estimates for *L1.VA* are respectively -0.0376 (statistically insignificant) and -0.0400 (statistically significant at the 10%-level). So the BB estimates for the lagged dependent variable *L1.VA* are bound from below (when using Within regressions) and from above (when using OLS), as they should be. The observed lower bounds for the fixed effects regressions expand to all the other regressions with the other dependent variables. In Appendix tables A3 and A4 higher bounds for the estimates of the lagged dependent variable also hold for *COMP*, *EMP*, and *WAGE*. The coefficient estimates are also are very close to but slightly *below* (rather than above) the Table 4 estimates for *GOS* and *PROD*, which may be due to the fact that the presence of the endogenous test variable, *INTEG_WITH_3_MOST*, also biases all coefficient estimates (more on this in the next paragraph). Overall, these results validate our BB estimates above.

Now, we turn our attention on the endogenous test variable's coefficient estimates in Appendix tables A1 through A4 and focus on *VA*, *GOS* and *PROD* regressions (for which we had statistically significant results in Table 4). As a reminder, in Table 4 the coefficient estimates of *L1.INTEG_WITH_3_MOST* for *VA*, *GOS* and *COMP* are equal to 0.6978, 3.1458, and 0.9107, respectively (all statistically significant at the 5%-level). First, we note that the estimates of

L1.INTEG_WITH_3_MOST would be downward biased when IV is *not* used (as in Appendix tables A1 and A3). In Appendix Table A1 where we estimate Eq. (1) with the Within estimator the coefficient estimates of *L1.INTEG_WITH_3_MOST* for *VA*, *GOS* and *COMP* are equal to 0.3896, 1.0639, and 0.2647, respectively, but statistically insignificant. These results are not surprising given the endogenous nature of our test variable. In Table A3 we show the OLS estimates: these suggest that the coefficient estimates for *VA*, *GOS* and *PROD* are downward biased as well (they are equal to 0.3199, 0.5001 and 0.2281, respectively, only the first and last ones being statistically significant at the 5%-level). The non-IV estimates for the endogenous test variable are downward biased as expected.

In contrast, the regressions in which the endogenous banking integration is instrumented provide estimates that are much closer to the system-AB framework. In Appendix Table A2 (GMM-2S with IV) the coefficient estimate of *L1.INTEG_WITH_3_MOST* for *VA* and *GOS* are equal to 0.5706 and 3.6409 but statistically insignificant, whereas that for *PROD* is equal to 0.5329 and statistically significant at the 5% level. In Table A4 (pooled-OLS with IV) the coefficient estimates for *VA, GOS* and *PROD* are equal to 0.8857, 3.2245 and 0.8669, respectively (all of which are statistically significant at the 1%-level). So the estimates that we obtain when test variable is instrumented are in the same order of magnitude across different estimators. These observations comfort us in the choice of the BB estimator.

5.2. Consistence check through a simple calibration exercise

Finally, to frame the findings of Sections 4 and 5.1, we conduct a simple, partial equilibrium, calculation exercise relying on a representative production function. The model is kept purposefully simple. Our goal is not to conduct a detailed output decomposition, but to have an intuitive benchmark with which we can assess the relative sizes of our coefficient estimates with respect to each other. With this objective in mind, we define the following constant-returns-to-scale Cobb-Douglas function with capital and labor as the only factors of production:

$$Y = A(K)^{\alpha}(L)^{1-\alpha} \tag{2}$$

where, Y is the output (i.e., value added), A is TFP, is K the capital stock, α is the capital intensity (share) parameter, and L is the labor employed. Imposing equilibrium conditions that marginal products of capital and labor are going to be equal with the return on capital (r) and wages (w), respectively, we can rewrite Eq. (2) as:[30]

$$Y = rK + wL \tag{3}$$

Substituting value added for Y, gross operating surplus (i.e., remuneration of capital) for rK, and compensation of labor for wL, Eq. (3) becomes:

$$VA = GOS + COMP \tag{4}$$

with direct links to our dependent variables. We further note that w = *WAGE*, L = *EMP*, and Y/L = *PROD*. Now, assuming that we start from some equilibrium and treating banking integration as an exogenous shock, we can frame and interpret the coefficient estimates that correspond to our dependent variables given the structure that equations (3) and (4) impose on them.

In our empirical work, we observe that the coefficient estimates for *INTEG_WITH_3_MOST* is statistically insignificant in the regressions where the dependent variable is the growth of *COMP* (γ_{COMP}), growth of *WAGE* (γ_{WAGE}) or the growth of *EMP* (γ_{EMP}). Eq. (3) suggests that not being able to distinguish *COMP* related estimates from zero makes sense given that *WAGE* (i.e., w) and *EMP* (i.e., L) related coefficient estimates are also empirically equivalent to zero.[31] In contrast, the coefficient estimates are positive and statistically significant for the growth of *VA* (γ_{VA}), *GOS* (γ_{GOS}), and *PROD* (γ_{PROD}). Eq. (4) suggests that the observed statistically significant increase in γ_{VA} as banking integration increases is due to γ_{GOS} rather than the growth of γ_{COMP}.

The Cobb-Douglas production framework in equations (2) through (4) suggests that an increase in *GOS* could have four sources. *GOS* could go up due (i) an increase in capital employed K, (ii) an increase in r, the demanded return on physical capital, (iii) an increase in A, i.e., TFP, or (iv) an increase in α, the capital intensity (or share) of the production process. Put differently, the observed increase in γ_{GOS} is due to an increase either in capital, its return, its productivity or intensity, or a

[30] Under the constant-returns-to-scale Cobb-Douglas production function, in equilibrium $r = \partial Y/\partial K = \alpha\, Y/K$ and $w = \partial Y/\partial L = (1-\alpha)\, Y/L$.

[31] We find, however a positive impact of banking integration on wage when we consider all industries (Table 3) or allow states to be defined as most-specialized in 5 and not 3 industries as in Table 9.

combination thereof. In our context of increasing banking integration, changes in all of these are plausible. Unfortunately, the macro data at our disposal do not allow us to discern which component is more likely to be the source of higher γ_{GOS} given the increases in banking integration.[32] That said, some of the findings in the literature are supportive of at least some of these possibilities. For example, Krishnan, Nandy, and Puri (2015) find that the TFP of small firms increases following interstate bank branching deregulations. Correa (2008) finds that the internal cash flow sensitivity of investments decreases for debt financing dependent firms following US banking deregulations. Rice and Strahan (2010) use the Survey of Small Business Finance data and find that in 1993 (in a cross-sectional regression which forms a counterfactual as they focus on interstate branching deregulations) borrowing costs go down by 23 basis points for firms with higher return on assets but also by the same amount for larger small firms.[33] However, none of these studies examine the industry dimension of banking integration as we do here.

Importantly, the simple Cobb-Douglas framework above allows us to frame our estimates (given an increase in banking integration) for γ_{GOS} and γ_{PROD} with respect to γ_{VA} given that γ_{COMP} does not change. For this exercise, first we fix the capital intensity parameter α equal to 0.3 as it is standard in the growth accounting literature (e.g., Barro and Sala-i-Martin, 2003) and we recall that $GOS = rK$. If γ_{GOS} is mainly driven by the growth of K (γ_K), because in the real world banks would equate returns on capital across different manufacturing and service sectors given the risk involved, then the Cobb-Douglas framework suggests that $\gamma_{VA} = \alpha\gamma_K = 0.3\gamma_K$.[34] Moreover, as employment ($EMP = L$) does not change, the growth in productivity per worker (γ_{PROD}) would equal that of VA (γ_{VA}), since $PROD = VA/L$. In fact, our coefficient estimates follow these orders of magnitude: following higher banking integration, the growth of *GOS* is roughly 2.5 to 3.5 times of *VA* and *PROD*, with the coefficient

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[32] Data on capital stock are publicly available either at the sectoral level for the entire US or for each state but only at for all manufacturing industries combined. Even if there would be state-industry level statistics available for *K*, separating out new investments, existing capital stock and depreciation from each other would not be trivial.

[33] In the Cobb-Douglas framework this would be consistent, in equilibrium, with a lower marginal product of capital and higher capital employed by firms (holding TFP constant). More banking competition that would lower lending margins could therefore lead to an increase in investment.

[34] To see this it suffices to look at the elasticity of *VA* with respect to *K* within the Cobb-Douglas framework: $\partial VA / \partial K \times K/Y = \alpha$.

estimates of the latter two being in the similar orders of magnitude. These observations are not only true for the coefficient estimates in Table 4 (base results for external finance dependent industries), as well as those in tables 7-10 (in various robustness checks), but also with the statistically weaker estimates of Table 3 when we combine all under-specialized industries irrespective of their external finance dependence. Our results are therefore internally consistent with banking integration causing an increase in investment in high-EFD under-specialized industries that drives the observed increases in value added and productivity per worker.

Our results suggest that the estimate for the growth of *WAGE* (i.e., w) although positive, is not significantly different from zero while the estimate for the growth of *EMP* (i.e., L) is close to zero and not statistically significant. Given these results, our simple Cobb-Douglas framework suggests no change in the overall under-specialized industry compensation *COMP* (= wL), which is indeed what we find as noted above. However, we also find that the growth of *PROD* (measuring productivity per worker) increases. So, in principle, firms could be interested in adding workers. How can we reconcile the fact that the coefficient estimates for our test variable are positive and statistically significant for *PROD*, but not statistically significant for *COMP*, *EMP* and *WAGE*? One possibility for under-specialized industries that we study is that there are many other sectors in the (local) economy that equalize the return to labor so there would be no change in wage. Another possibility is that at the same time as investment in capital, the capital usage intensity α increases (as discussed above), which automatically lowers the marginal product of labor, keeps wages unchanged, does not affect employment but can increase productivity per worker. Perhaps the reason may be also due to the short-run nature of our study: we capture immediate effects of banking integration (within a year) on the variables of interest.[35] Wage increases may be gradual after bargaining between workers and the management; similarly the employment decisions may be staggered over time after increases in

[35] Demyanyk, Ostergaard and Sørensen (2007) find that the personal income insurance (the ability of personal income to absorb state-level shocks) increases over the years post-interstate banking deregulations whereas Demyanyk (2008) finds that self-employed income increased over the years after interstate branching deregulations. Both studies relate their findings to the availability of more small business finance post-deregulation, but neither of them has an industry dimension.

capital.[36] In other words, the effects of banking integration on wages and employment could be delayed in time and of second-order.

6. Conclusion

We examine whether interregional banking integration could affect industry structure. Identifying banking's effect on the real sector at the industry level is difficult empirically for a number of reasons. First, endogeneity is a major challenge, as financial institutions entry decisions in new markets need not be separated from their growth opportunities. The staggered state-pair interstate banking deregulations allow us to identify the effects of banking integration, as they permit instrumenting for our test variable. Second, dynamic panel bias may be of a concern, so we follow the practice in the finance-growth literature to rely on the system-AB estimator to deal with the potential persistence and mean-reversion of the dependent variables that are industry-state-level growth measures (as in Beck, Levine and Loayza, 2000, Levine, Loayza and Beck, 2000, and Bruno and Hauswald, 2014). Third, because it is impossible to measure directly banks' industry expertise in lending with the macro-level data that are available; we proxy for industry knowledge by the banks' higher exposure to certain industries in their home markets.

We find evidence consistent with our conjecture that banking integration affects states' industry structures: following interstate bank-entry deregulation, as MBHCs (that were over-exposed to certain industries in which their home state is over-specialized) acquired banks in other states for the first time, the resulting integration among banks led to an increase in the growth of under-specialized sectors of activity over-and-above the growth of the same sector in non-integrated states in which it is also under-specialized. This effect is clearly present in industries that are more external finance dependent, which are the focus of our study.

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[36] We could not rule out that there would be a positive effect on employment in the longer run: if capital per worker increases, then the marginal product of labor would increase, and this could induce firms to hire more. In Table 4 the effect of banking integration on the compensation *COMP* = *wL* is positive (with a p-value that it is not statistically different from zero at the 16%-level). See also the results in Table 7 (1982-1997 sample) where there is a positive and statistically significant effect of banking integration on compensation *COMP* but the changes in its components (changes in *WAGE* and *EMP*) are not statistically different from zero even if positive.

Our results, which are robust in the series of checks that we conduct, indicate a channel through which the industrial landscape is shaped by banks' lending choices. As banking organizations make use of the information that they have accumulated in their home market when they enter the new markets (states) for the first time, the industries that were under-developed in the latter markets benefit. We do not know whether this effect is due to higher amount of sector-specific lending, or better pricing, as our data do not contain such refined information. The policy dilemma is obvious: banking regulators' decision for foreign bank entry can have implications beyond the stability of the financial system: new banks can affect industrial structure in a way that depends on their country of origin and as a result can affect sector-specific development.

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Table 1
Under- and over-specialized industries

Industry Name	BEA ID	2-Digit SIC Correspondence	High EFD	Number of States in which the industry is among the under-specialized sectors	Number of states in which the industry is among bottom-3 under-specialized sectors	Number of states in which the industry is among the over-specialized sectors	Number of states in which the industry is among top-3 over-specialized sectors	Name of states in which the industry is among top-3 over-specialized sectors
Lumber and wood products	14	24	0	24	3	24	10	AR, ID, ME, MS, MT, OR, VA, VT, WA, WY
Furniture and fixtures	15	25	0	33	1	15	4	MI, MS, NC, VA
Stone, clay, and glass products	16	32	1	24	0	24	4	NV, PA, OK, WV
Primary metal industries	17	33	0	32	1	16	5	IN, MD, OH, PA, WV
Fabricated metal products	18	34	0	36	0	12	3	CT, IL, MI
Industrial machinery and equipment	19	35	1	30	0	18	3	IA, NH, WI
Motor vehicles and equipment	21	371	0	40	12	8	5	DE, IN, KY, MI, OH
Other transportation equipment	22	372-379	0	34	10	14	6	AZ, CT, FL, KS, MO, WA
Miscellaneous manufacturing	24	39	1	31	0	17	5	MA, NJ, NV, RI, SD
Food and kindred products	26	20	0	25	0	23	4	IA, ID, ND, NE
Textile mill products	28	22	1	40	21	8	6	AL, GA, NC, RI, SC, VA
Apparel and other textile products	29	23	0	32	3	16	2	NC, NY
Paper and allied products	30	26	0	30	1	18	7	AL, GA, ME, MN, OR, WA, WI
Printing and publishing	31	27	0	29	1	19	3	FL, NV, NY
Chemicals and allied products	32	28	1	33	2	15	4	DE, LA, NJ, WV
Petroleum and coal products	33	29	1	33	14	15	6	LA, MS, MT, OK, TX, WY
Rubber and misc. plastics products	34	30	1	26	0	22	2	IA, OK
Leather and leather products	35	31	1	30	8	18	7	CO, MA, ME, MO, NH, RI, WI
Electronic equip. and instruments	76	36 & 38	1	33	0	15	3	AZ, CA, VT
Average				31.3	4.1	16.7	4.7	

Table 2
Descriptive Statistics

Panel A presents the summary statistics for the variables used in the analysis. The dependent variables come from the Bureau of Economic Analysis (BEA) Regional Economic Accounts data between 1982 and 1995. It consists of 48 contiguous US states (Alaska, Hawaii, and the District of Columbia are excluded) and 19 manufacturing industries at two-digit SIC level (tobacco industry is excluded). The dependent variable is the growth of industry-level measure Y, which is defined as $\Delta\, ln(Y) = ln\,(Y_t) - ln\,(Y_{t-1})$. The industry-level measures are Value Added (VA), Gross Operating Surplus (GOS), Compensation of Employees (COMP), employment (EMP), productivity (PROD) and worker remuneration (WAGE). VA is the contribution of an industry to gross state product. GOS is the surplus accrued to capital from production. COMP consists of wages, salaries and social benefits paid to employees. EMP is the wage and salary employment in the industry. PROD is a measure of productivity calculated as VA/EMP. WAGE is a measure of compensation per worker COMP/EMP. Our sample contains industry-year observations of the deregulating states ("host states" hereafter) that have an industry-specialization level that is below one at the time of deregulation. The suffix *_3_MOST* refers to the states in which a given industry consistently ranks among the top 3 industries in terms of specialization during the deregulation period ("most-specialized" states). The suffix *_3_LEAST* refers to the states in which the industry consistently ranks among the bottom 3 industries in terms of specialization during the deregulation period ("least-specialized" states). The following definitions are given for variables ending with *_3_MOST* for parsimony; similar definitions apply to variables ending with *_3_LEAST*. The endogenous variable *INTEG_WITH_3_MOST* is the sum of banking integration of the host state with each most-specialized state. Banking integration is measured as the banking assets owned by the most-specialized state's banks in the host state plus the banking assets owned by the host state's banks in most-specialized state, divided by the sum of the banking assets of the two states. The instrumental variable *YEARS_DEREG_3_MOST* is the sum of average years passed since integration of host state with each most-specialized state. *FIRST_DEREG_3_MOST* is the square root of years passed since the beginning of integration with most-specialized states. *DATE_DEREG_3_MOST* is the date that the host state opened up its banking sector to most-specialized states. *SPEC_DEREG_3_MOST* is the industry specialization level of the host state at the time of opening towards most-specialized states. *SPEC_3_MOST* is the specialization level of most-specialized states and *NUMBER_3_MOST* is the number of states that are identified as most-specialized for a particular industry. *D_LOW_EFD* takes value 1, if the industry is below median in external finance dependency computed by the method in Rajan and Zingales (1998), and 0 otherwise. Panel B displays the summary statistics of the dependent, endogenous and instrumental variables for high external finance dependent industries.

Panel A: All industries

Variable	Number of obs.	Mean	Std. Dev.	Min	Max
Dependent Variables					
Δln(VA)	8177	0.055	0.194	-1.54	1.784
Δln(GOS)	7043	0.062	0.584	-4.812	5.242
Δln(COMP)	7756	0.049	0.128	-1.609	1.099
Δln(EMP)	7827	0.009	0.121	-2.108	1.742
Δln(PROD)	7799	0.045	0.16	-1.647	2.108
Δln(WAGE)	7756	0.040	0.076	-0.725	0.788
Endogenous (Instrumented) Variables					
INTEGRATION_3_MOST	8330	0.007	0.024	0	0.317
INTEGRATION_3_LEAST	8232	0.010	0.033	0	0.443
Instrumental Variables (IVs)					
YEARS_DEREG_3_MOST	8330	4.763	8.015	0	67.241
YEARS_DEREG_3_LEAST	8232	4.647	12.746	0	127.759
FIRST_DEREG_3_MOST	8330	1.032	1.096	0	3.501
FIRST_DEREG_3_LEAST	8232	0.622	0.985	0	3.501

Panel B: External finance dependent industries

Variable	Number of obs.	Mean	Std. Dev.	Min	Max
Dependent Variables					
Δln(VA)	3811	0.051	0.201	-1.447	1.784
Δln(GOS)	3292	0.060	0.564	-4.812	5.242
Δln(COMP)	3536	0.046	0.138	-1.609	1.099
Δln(EMP)	3600	0.006	0.131	-2.108	1.085
Δln(PROD)	3577	0.045	0.166	-1.647	2.108
Δln(WAGE)	3536	0.041	0.085	-0.725	0.709
Endogenous (Instrumented) Variables					
INTEGRATION_3_MOST	3920	0.005	0.021	0	0.317
INTEGRATION_3_LEAST	3948	0.013	0.039	0	0.443
Instrumental Variables (IVs)					
YEARS_DEREG_3_MOST	3920	4.615	7.815	0	49.422
YEARS_DEREG_3_LEAST	3948	5.634	15.249	0	127.759
FIRST_DEREG_3_MOST	3920	1.274	1.126	0	3.501
FIRST_DEREG_3_LEAST	3948	0.552	0.948	0	3.271

Table 3

State-level industry growth: banking integration with states in which the sector is among the three most specialized

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1995 and contain manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test corresponds to the joint significance of all variables in the specification. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-Stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (Y=)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.3170	*	0.7620		0.0966		0.0127		0.3201	**	0.1433	*
	(1.78)		(1.29)		(0.78)		(0.12)		(2.10)		(1.88)	
L1.Δln(Y)	0.0165		-0.3199	***	0.1141	***	0.1627	***	-0.1559	***	-0.2281	***
	(0.89)		(10.20)		(4.71)		(7.61)		(7.36)		(6.41)	
L2.Δln(Y)			-0.1501	***					-0.0867	***	-0.1014	***
			(5.76)						(3.64)		(3.22)	
L3.Δln(Y)			-0.0524	**					-0.0206		-0.0215	
			(2.42)						(1.17)		(0.65)	
Number of observations	8161		6296		7652		7722		7535		7494	
Number of clusters	591		557		583		588		582		580	
Number of exogenous instruments	1010		1010		1010		1010		1010		1010	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.8511		0.2645		0.2431		0.1201		0.3185		0.3765	
AR3 test's p-value	0.9456		0.4868		0.4767		0.5128		0.1140		0.6090	

Table 4
State-level external finance dependent industries' growth: banking integration with states in which the sector is among the three most specialized

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1995 and contain high (above median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test is for the joint significance of all variables in the regression. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y*=)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.6978	**	3.1458	**	0.3934		-0.0013		0.9107	**	0.1462	
	(2.29)		(2.20)		(1.43)		(0.01)		(2.27)		(0.92)	
L1.Δln(Y)	-0.0069		-0.3190	***	0.0669	*	0.1394	***	-0.1663	***	-0.2766	***
	(0.30)		(7.88)		(1.95)		(4.44)		(7.58)		(6.13)	
L2.Δln(Y)			-0.1129	***	-0.0624						-0.1122	***
			(3.38)		(1.55)						(3.16)	
L3.Δln(Y)					0.0092						0.0327	
					(0.23)						(1.00)	
Number of observations	3797		3056		3373		3534		3511		3373	
Number of clusters	278		263		267		275		273		267	
Number of exogenous instruments	870		870		870		870		870		870	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.9478		0.4108		0.7952		0.8336		0.1130		0.7368	
AR3 test's p-value	0.8458		0.2081		0.3541		0.7518		0.2817		0.5350	

Table 5
State-level non-external finance dependent industries' growth: banking integration with states in which the sector is among the three most specialized

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, industry-year, and state-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test is for the joint significance of all variables in the regression. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y*=)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.0383		-0.4130		0.0421		0.0327		0.0919		0.0228	
	(0.21)		(0.60)		(0.36)		(0.29)		(0.66)		(0.34)	
L1.Δln(Y)	0.0384		-0.3464	***	0.1305	***	0.1845	***	-0.1003	***	-0.1736	***
	(1.37)		(7.51)		(3.45)		(6.56)		(4.38)		(4.08)	
L2.Δln(Y)			-0.2045	***			-0.1201	***				
			(5.85)				(2.60)					
L3.Δln(Y)			-0.1422	***								
			(4.45)									
L4.Δln(Y)			0.0135									
			(0.65)									
Number of observations	4364		3248		4182		4159		4184		4182	
Number of clusters	313		292		313		313		313		313	
Num. of exogenous instruments	884		884		884		884		884		884	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.6316		0.3255		0.9450		0.3204		0.2219		0.4574	
AR3 test's p-value	0.6408		0.3423		0.6722		0.2473		0.1703		0.8762	

Table 6
State-level external finance dependent industries' growth: banking integration with states in which the sector is among the three least specialized

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1995 and contain high (above median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_LEAST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three least-specialized sectors throughout 1982-1995. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_LEAST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test is for the joint significance of all variables in the regression. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y*=)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_LEAST	-0.0408		0.3667		0.0862		-0.4050		-0.0430		-0.1413	
	(0.11)		(0.36)		(0.37)		(1.64)		(0.15)		(1.20)	
L1.Δln(Y)	-0.0050		-0.2923	***	0.0786	**	0.1447	***	-0.1625	***	-0.2644	***
	(0.21)		(9.16)		(2.32)		(4.58)		(6.73)		(5.62)	
L2.Δln(Y)			-0.0874	***	-0.0587						-0.1000	***
			(3.36)		(1.50)						(2.70)	
L3.Δln(Y)					0.0194						0.0415	
					(0.50)						(1.28)	
Number of observations	3825		3074		3386		3550		3527		3386	
Number of clusters	280		265		269		277		275		269	
Num. of exogenous instruments	870		870		870		870		870		870	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.8027		0.6072		0.9184		0.8389		0.1639		0.6591	
AR3 test's p-value	0.8306		0.6601		0.3603		0.6843		0.3153		0.6034	

Table 7
State-level external finance dependent industries' growth: banking integration with states in which the sector is among the three most specialized – 1982-1997 sample

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1997 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test is for the joint significance of all variables in the regression. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y*=)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.6961	**	2.4626	*	0.6756	*	0.2810		1.0761	**	0.1756	
	(2.26)		(1.90)		(1.84)		(1.34)		(2.50)		(1.33)	
L1.Δln(Y)	-0.0197		-0.3060	***	0.0414		0.1233	***	-0.1930	***	-0.3083	***
	(0.93)		(8.27)		(1.14)		(4.58)		(7.66)		(8.05)	
L2.Δln(Y)			-0.1197	***	-0.0721	*			-0.0727	***	-0.1407	***
			(3.98)		(1.91)				(3.17)		(3.75)	
L3.Δln(Y)					0.0369							
					(0.84)							
Number of observations	4352		3519		3861		4041		3956		3911	
Number of clusters	279		266		268		277		272		270	
Num. of exogenous instruments	994		994		994		994		994		994	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.7095		0.4319		0.4432		0.2611		0.7298		0.1076	
AR3 test's p-value	0.6377		0.3282		0.2612		0.3231		0.4794		0.3699	

Table 8
State-level high external finance dependent industries' growth: banking integration with states in which the sector is among the three most specialized – after dropping the five smallest states

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test is for the joint significance of all variables in the regression. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y*=)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.7237	**	3.2323	**	0.2011		0.0101		0.9147	**	0.0663	
	(2.36)		(2.24)		(0.85)		(0.05)		(2.27)		(0.48)	
L1.Δln(Y)	-0.0242		-0.3243	***	0.0818	**	0.1405	***	-0.1791	***	-0.2190	***
	(0.95)		(7.86)		(2.23)		(3.68)		(7.98)		(5.16)	
L2.Δln(Y)			-0.1214	***	-0.0431						-0.0858	***
			(3.63)		(0.93)						(2.78)	
L3.Δln(Y)					0.0096						0.0580	*
					(0.23)						(1.78)	
Number of observations	3514		2887		3142		3262		3259		3142	
Number of clusters	253		245		248		251		251		248	
Num. of exogenous instruments	800		800		800		800		800		800	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.6451		0.4029		0.8987		0.9728		0.1321		0.3665	
AR3 test's p-value	0.8068		0.2896		0.7702		0.1274		0.3313		0.9710	

Table 9
State-level external finance dependent industries' growth: banking integration with states in which the sector is among the five most specialized

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test is for the joint significance of all variables in the regression. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y* =)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.5938	**	1.9997	**	0.1769		-0.2136		0.7908	**	0.2501	*
	(2.14)		(2.14)		(0.88)		(1.05)		(2.49)		(1.81)	
L1.Δln(Y)	-0.0034		-0.2907	***	0.0684	**	0.1404	***	-0.1650	***	-0.2677	***
	(0.15)		(8.59)		(2.05)		(4.47)		(7.29)		(6.21)	
L2.Δln(Y)			-0.0825	***	-0.0627						-0.1032	***
			(3.02)		(1.61)						(3.08)	
L3.Δln(Y)					0.0084						0.0391	
					(0.21)						(1.18)	
Number of observations	3783		3033		3349		3513		3490		3349	
Number of clusters	277		262		266		274		272		266	
Num. of exogenous instruments	870		870		870		870		870		870	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.9931		0.4968		0.7719		0.7117		0.1357		0.7516	
AR3 test's p-value	0.9651		0.6088		0.2305		0.6447		0.3319		0.6130	

Table 10
State-level external finance dependent industries' growth: banking integration with states in which the sector is among the three most specialized – Hansen test for the validity of the IVs

This table presents dynamic panel regressions with instrumental variables (IV) using Blundell and Bond's (1998) system-GMM estimator. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH_3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The Wald test is for the joint significance of all variables in the regression. Reported ARn p-values correspond to Arellano-Bond test of n^{th}-order autocorrelation in the error terms, with the null hypothesis being no autocorrelation (AR1 appears by construction of the Arellano-Bond model and is fully consistent with the specification). *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y* =)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.8533	*	3.7534	*	0.1247		0.2189		0.7751	*	-0.0180	
	(1.68)		(1.85)		(0.36)		(0.70)		(1.83)		(0.10)	
L1.Δln(Y)	-0.0021		-0.3975	***	0.0786		0.1244	*	-0.1055	**	-0.1942	***
	(0.07)		(5.27)		(1.13)		(1.89)		(2.47)		(4.33)	
L2.Δln(Y)			-0.2136	***	-0.0409							
			(2.75)		(0.67)							
Number of observations	3797		3056		3419		3534		3511		3470	
Number of clusters	278		263		269		275		273		270	
Num. of exogenous instruments	206		206		206		200		200		200	
Wald test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Hansen test's p-value	0.3853		0.2421		0.2877		0.2033		0.9208		0.1987	
AR1 test's p-value	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
AR2 test's p-value	0.5777		0.4831		0.3208		0.7792		0.3388		0.1585	

Appendix Table A1

State-level external finance dependent industries' growth: banking integration with states in which the sector is among three most specialized – panel fixed effects (Within) regressions

This table presents panel fixed effects (within) regressions. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^th lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. All empirical models contain year, state-industry, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The F-test is for the joint significance of all variables in the regression. *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y* =)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.3896		1.0639		-0.2826		-0.1457		0.2647		-0.2107	
	(1.32)		(0.96)		(0.73)		(0.60)		(0.97)		(1.08)	
L1.Δln(Y)	-0.0835	***	-0.3944	***	0.0057		0.0679	**	-0.2518	***	-0.3598	***
	(3.11)		(10.63)		(0.17)		(2.48)		(10.62)		(8.42)	
L2.Δln(Y)			-0.1754	***	-0.1061	***					-0.1836	***
			(5.71)		(2.66)						(5.00)	
L3.Δln(Y)					-0.0354						-0.0143	
					(0.88)						(0.40)	
Number of observations	3797		3056		3373		3534		3511		3373	
Number of clusters	278		263		267		275		273		267	
R^2	0.3038		0.4428		0.3074		0.3072		0.3910		0.4471	

Appendix Table A2
State-level external finance dependent industries' growth: banking integration with states in which the sector is among three most specialized – GMM two-stage IV regressions

This table presents panel LIML two-stage IV Within regression results. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t[th] lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH _3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, industry-year, and state-year fixed-effects. Robust standard errors are provided in parentheses below coefficient estimates. The F-test is for the joint significance of all variables in the regression. *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively. †, ††, ††† indicate a rejection of the weak-instruments test at the 10%, 15% and 20% levels, respectively.

Dependent variable (*Y* =)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	.5722		3.8613		0.0807		-0.5251		1.5935	*	-0.0372	
	(1.22)		(1.36)		(0.10)		(0.98)		(1.83)		(0.09)	
L1.Δln(Y)	-0.0840	***	-0.3957	***	0.0056		0.0684	***	-0.2536	***	-0.3591	***
	(3.46)		(12.24)		(0.19)		(2.82)		(12.15)		(9.50)	
L2.Δln(Y)			-0.1765	***	-0.1068	***					-0.1831	***
			(6.60)		(3.02)						(5.63)	
L3.Δln(Y)					-0.0354						-0.0136	
					(1.00)						(0.44)	
Number of observations	3796		3053		3370		3533		3510		3370	
Number of clusters	277		260		264		274		272		264	
F-test statistic	4.96	***	38.17	***	1.86		4.23	**	59.12	***	18.73	***
Within-R^2	0.0072		0.1256		0.0125		0.0042		0.0527		0.1255	
Under-identification test	10.33	***	19.88	***	19.13	***	19.77	***	19.78	***	19.31	***
Weak instruments test (Kleibergen-Paap rk Wald F statistic)	6.28	††	6.44	††	6.89	††	7.93	††	7.94	††	6.93	††
Over-identification test (Hansen's J-statistic)	0.02		0.49		2.43		4.50	**	0.46		0.37	

Appendix Table A3
State-level external finance dependent industries' growth: banking integration with states in which the sector is among three most specialized – pooled-OLS regressions

This table presents pooled-OLS regressions. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH_3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. All empirical models contain year, state-year, and industry-year fixed-effects. The standard errors are clustered at the host state-industry level. The F-test is for the joint significance of all variables in the regression. *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable (*Y* =)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.3199	**	0.5001		0.0509		0.0307		0.2281	**	0.0106	
	(1.98)		(1.09)		(0.35)		(0.27)		(2.13)		(0.14)	
L1.Δln(Y)	-0.0376		-0.3246	***	0.0862	***	0.1288	***	-0.2060	***	-0.2739	***
	(1.37)		(8.21)		(2.65)		(4.37)		(7.65)		(6.33)	
L2.Δln(Y)			-0.1181	***	-0.0409						-0.1101	***
			(3.76)		(1.16)						(2.87)	
L3.Δln(Y)					0.0033						0.0245	
					(0.11)						(0.68)	
Number of observations	3797		3056		3373		3534		3511		3373	
Number of clusters	278		263		267		275		273		267	
R^2	0.3006		0.4160		0.3196		0.3294		0.3777		0.4138	

Appendix Table A4

State-level high external finance dependent industries' growth: banking integration with states in which the sector is among three most specialized – pooled-OLS with IV regressions

This table presents pooled-IV regressions. Data cover 1982-1995 and contain low (below median) external finance dependent manufacturing sectors with a specialization index below one as of the host-state's year of first bank-entry deregulation. The dependent variable [*Δln(Y)*] is state-industry-year-level growth of manufacturing sectors in the host state. *Y* is either Value Added (*VA*), Gross Operating Surplus (*GOS*), compensation of employees (*COMP*), number of employees (*EMP*), productivity as measured by output per employee (*PROD*), or wage measured as compensation per employee (*WAGE*). *Lt* represents the t^{th} lag. The endogenous test variable *INTEG_WITH _3_MOST* is defined as the sum of banking integration of the host state with each state in which a given industry consistently ranks among its three most-specialized sectors throughout the sample. For each state-pair banking integration is measured as the sum of the across-state total assets owned by the banks of the two states within the pair, divided by the sum of the banking total assets of the two states. *INTEG_WITH _3_MOST* is instrumented with (i) the sum of average years passed since integration of the host state with each of the most-specialized states and (ii) the square root of years passed since the beginning of integration with most-specialized states. All empirical models contain year, industry-year, and state-year fixed-effects. Robust standard errors are provided in parentheses below coefficient estimates. The F-test is for the joint significance of all variables in the regression. *t*-stats are reported below coefficient estimates. *, **, *** denote statistical significance at 10%, 5%, and 1% levels, respectively. †, ††, ††† indicate a rejection of the weak-instruments test at the 10%, 15% and 20% levels, respectively.

Dependent variable (*Y* =)	*VA*		*GOS*		*COMP*		*EMP*		*PROD*		*WAGE*	
L1.INTEG_WITH_3_MOST	0.8870	***	3.2263	**	0.2662		0.0960		0.8672	**	-0.0675	
	(2.64)		(2.22)		(1.36)		(0.55)		(2.33)		(0.55)	
L1.Δln(Y)	-0.0400		-0.3264	***	0.0853	***	0.1287	***	-0.2083	***	-0.2734	***
	(1.63)		(9.55)		(2.97)		(4.97)		(8.81)		(7.23)	
L2.Δln(Y)			-0.1204	***	-0.0423						-0.1093	***
			(4.45)		(1.37)						(3.26)	
L3.Δln(Y)					0.0023						0.0249	
					(0.08)						(0.79)	
Number of observations	3797		3056		3373		3534		3511		3373	
Number of clusters	278		263		267		275		273		267	
F-test statistic	3.34	**	24.42	***	2.79	**	9.58	***	30.72	***	10.95	***
R^2	-0.0012		0.0783		0.0073		0.0181		0.0342		0.0748	
Under-identification test	10.42	***	8.78	**	9.21	**	8.07	**	8.12	**	9.19	**
Weak instruments test (Kleibergen-Paap rk Wald F statistic)	6.99	††	4.92	†	5.73	††	4.90	†	4.92	†	5.75	††
Over-identification test (Hansen's J-statistic)	2.02		0.43		0.30		0.05		0.50		0.00	

Fig. 1.

The number of effective state-pair deregulations for states in which two-digit SIC level industries are under-specialized