Contract-Intensive Industries: Does Finance Matter?

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Abstract

We show that contract-intensive industries particularly thrive both in countries with high initial level of financial development and in the US states that deregulated their banking sector. These industries use high share of relationship-specific inputs that can be purchased only via specific contracts with the suppliers. Accordingly, both firms in those industries and their suppliers face above-average levels of risk and transaction costs. Our empirical results thus confirm the theoretical claim that finance promotes real economy via managing risk and decreasing transaction costs. Furthermore, the pro-growth effect of finance seems to come from financial intermediaries like banks rather than from stock markets. This suggests that the intrinsic functions of relationship-banking (long-term commitment, increase in reputation and planning horizon of the borrowers) are especially important for the contract-intensive industries.

Keywords: financial development, growth, industry level data, instrumental variable regression.

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1 Introduction

This paper examines a possible channel through which finance might affect the real economy and promote the long-run growth. Specifically, we examine whether the contract-intensive industries particularly benefit from the financial development and the efficient banking system. The notion of contract-intensive sectors was introduced in the recent trade literature on incomplete contracts and comparative advantage (Levchenko 2007, Nunn 2007). Following Nunn (2007), we define contract-intensive industries as sectors using high share of intermediate inputs that neither can be sold on organized exchange, nor are reference-priced. This characteristic has two important implications. First, the firms active in such industries have to rely on specific contracts with their suppliers, which increase the transaction costs of the production. Second, those suppliers have to undertake relationship-specific investment before selling their intermediate products. As the value of such specific inputs is higher inside the buyer-seller relationship than outside it, the seller has to be sure that the buyer will fulfill its commitments. If the seller faces an uncertainty in this regard, there will be under-investment resulting from such relations-specific contracts. To sum up, the relationship-specific contracts increase risk and transaction costs for both suppliers and buyers in the contract-intensive industries.

The financial development might therefore play a vital role in promotion of contract-intensive industries. After all, the management of risk and decreasing of transaction costs belong to the main functions of finance (see e.g. Levine 2005). Furthermore, we argue that it is not just the overall level of financial development that matters. There are several reasons to expect a pre-eminent role of banking sector (as opposed to the stock market) in the promotion of contract-intensive industries. Conceptually, the bank loans are themselves contracts that include (explicitly or implicitly) relationship-specific investment and long-term commitment between the bank and client (Boot 2000, Ongena-Smith 1998). The banks often invest in acquiring deep knowledge about specific industry in order to better fine-tune its services (Boot-Thakor 2000). This makes sense, especially as banks usually offer other financial products (e.g. insurance) alongside the credits. This approach might be especially helpful for industries that are characterized by high degree of relationship-specific contracts with their suppliers. Furthermore, the bank credits increase reputation (Fama 1985) and planning horizon (von Thadden 1995) of the borrowers and due to long-term commitment provide also better protection against adverse economic shocks. Those functions of relationship-banking should matter especially in the case of contract-intensive industries. The suppliers will be arguably more willing to undertake high levels of relationship-specific instruments, if the buyer possess good reputation, long-term planning horizon and funding that comes from a long-term committed lender. The existing theories thus suggest that contract-intensive industries should especially thrive in economic environment characterized by a good financial system in general and a well-developed banking sector in particular. We test this hypothesis in two ways.

First, we look at the international data and show that contract-intensive industries grow faster in countries with high initial level of financial development. We also provide evidence that this effect comes from banking sector rather than from stock market. From the methodological point of view, our paper here continues in the tradition that started with the work of Rajan and Zingales (1998). In their seminal contribution, Rajan and Zingales handle the endogeneity issue that is at the core of the finance-growth nexus and couldn't be solved in a satisfactory way by the previous cross-country growth studies. In the first step they focus on a specific theoretical mechanism through which finance promotes economic growth and identify industries that disproportionately rely on this mechanism. In the second step they show that those industries indeed profit from financial development more than the others. Rajan and Zingales (1998) examine the role of finance in providing external liquidity to firms. Our focus is instead on the use of finance in managing risks and decreasing the transaction costs.

In the second part of the paper we examine the US data. Starting with Jayaratne and Strahan (1996), an influential strand of finance-growth literature utilizes the fact, that since 1970s most of the US states started to remove regulations that constrained intrastate branching.[1] The branch deregulation offers a unique natural experiment as it occurred in different states at different points of time. Jayaratne and Strahan (1996) control for state and time fixed effects and show that the GDP growth in an average US state accelerates after it relaxes restriction on intrastate branching. To the extent that deregulation leads to more competitive and efficient banking industry, this result

[1] At the beginning of the 1970s the large majority of the US states restricted the geographical scope of the banking operations, even within their own borders. In the 1970s those states started to allow bank holding companies to consolidate their bank subsidiaries into branches (M&A branch deregulation) and to permit de novo branching statewide. The deregulation of de novo branching occurred either at the same time or somewhat later than the M&A branch deregulation. For a review of this literature see Strahan (2003).

provides support for the existence of a causal link between finance and economic growth. We extend the existing work on branch deregulation and show that its pro-growth effects work mostly via contract-intensive industries. Such outcome is far from obvious. The branch deregulation lead not only to more efficient but also to more consolidated banking sector in the USA. The increased quality of surviving banks should benefit the contract-intensive industries that heavily depend on the quality of bank services.[2] The effect of bank consolidation is not that clear-cut. On one hand, small banks might have comparative advantage in relationship lending over the large banks. This implies, that contract-intensive industries could suffer as a consequence of bank consolidation. On the other hand, Boot and Thakor (2000) show that increased interbank competition gives the banks the incentive to differentiate themselves and actually to increase the level of relationship lending.[3] Our results support the view that the deregulation has an overall positive effect on firms dependent on relationship lending.

This paper contributes to three strands of literature. First, it identifies a new channel through which finance might affect the real economy. The question whether financial development promotes growth or merely follows the real economy goes back at least to Schumpeter (1912) and Robinson (1952) and is probably the crucial one in the whole finance-growth literature. The argument over causality can be best solved by documenting a specific mechanism through which finance affects economic growth. The search for such mechanism has focused since Rajan and Zingales (1998) on the industries that don't generate enough cash-flow and are thus dependent on external finance. In this paper we look at industries that rely on banks as the source of risk management and decrease of transaction costs rather than depending on the financial system as a liquidity provider.

Second, the story in this paper is complementary to the idea pursued in the recent literature on trade and incomplete contracts. Levchenko (2007) and Nunn (2007) show that the export performance of the contract-intensive industries is stronger in the countries characterized by good institutions, especially in form of effective contract enforcement. The notion that well-functioning contract enforcement leads to more relationship-specific investment and thus promotes contract-intensive industries is un-

[2]Jayaratne and Strahan (1996) show that the share of both non-performing loans and loans to insiders (managers, major shareholders) decreases following the branch deregulation.

[3]Black and Strahan (2002) provide a good overview of the controversy regarding the effects of bank consolidation on relationship lending.

doubtedly a plausible one. The point of this paper is following: Even in a country with superior institutions and perfect contract enforcement, the suppliers will still value good reputation, long-term planning horizon and financial stability of the purchasers. As long as financial intermediaries like banks can provide those, there might be an independent role for financial development in promoting the contract-intensive industries. The current financial crisis made this point painfully clear. In difficult times even the most effective contract enforcement mechanism might fail to protect the suppliers if the buyer cannot rely on a strong and committed bank.

Finally, the last part of the paper contributes to the literature documenting the acceleration in growth rates of the US states after the removing of restrictions on the intrastate branching. This body of empirical work belongs to the most influential in the finance-growth literature, but is not free of controversy. This paper addresses two important arguments contesting the positive effects of branch deregulation. First, the bank consolidation following such deregulation could hurt the firms relying on the relationship lending. The theoretical and empirical work on this issue has focused on the effects of branch deregulation on small and/or new enterprises that traditionally depend on relationship banking. By looking at the contract-intensive industries our paper examines an alternative set of bank-dependent firms and supports the benign view of branch deregulation. The second argument has to do with the possible substitution between commercial banks and nonbank financial institutions. According to Huang (2008) the well-developed nonbank institutions and capital markets in the USA could meet the firms' financing demands that were not satisfied by the geographically restricted banks. The substitution argument might well apply to the firms seeking merely a source of external financing. It is less relevant for firms in contract-intensive industries that need bank loans to signal their suppliers a good reputation, long-term planning horizon and financial stability.

2 Methodology and data

2.1 Empirical model

Our empirical model is based on the methodology introduced initially by Rajan and Zingales (1998) and then extensively used in the empirical literature examining the effects of financial development on economic growth. The main idea is to capture specific mechanism through which a country characteristic like financial development affects the growth. Intuitively, the researcher identifies a set of industries that are especially dependent on some aspect of finance and shows that those industries grow faster in countries characterized by high level of financial development.

In our paper we estimate the following specification:

$$G_{ic} = \alpha + \beta FD_{c0} * CI_i + \gamma X_{ic} + \delta_i + \eta_c + \varepsilon_{ic} \quad (1)$$

where the subscript c and i indicates country and industry respectively and the subscript 0 indicates beginning of the period variables. As a dependent variable we use several proxies for industrial growth: average growth of output, average growth of number of establishments, average growth of output per establishment, average growth of employment, average growth of capital stock and average growth of TFP. Our main variable of interest is $CI_i * FD_{c0}$, where FD_{c0} is the initial financial development in country c and CI_i is the contract intensity measure introduced by Nunn (2008). X_{ic} is a vector of controls and δ_i and η_c are industry and country dummies that take care of wide range of omitted variables.

It is important to emphasize the fact that the industry characteristic CI_i is computed solely from the US industrial data. This approach is based on two assumptions. First, assuming that the U.S. markets are well functioning and (relatively) frictionless, equilibrium variables in the US can be taken as good proxies for exogenous technological characteristics of the production process in a given industry. Second, as long as the relative ranking of industry characteristics are the same across countries, the technological characteristics of the U.S. industries are representative of technologies used in the other countries. Those assumptions allow for causal interpretation of estimated coefficients on the interaction terms of country and industry characteristics.

A positive coefficient of our main variable of interest, $CI_i * FD_{c0}$, indicates that contract-intensive industries benefit on average more from a country's financial development. The effect of financial development on contract-intensive industries could occur via two possible channels. The domestic financial institutions facilitate the contracting between intermediate goods suppliers and final goods producers by managing risks and decreasing the transaction costs. At the same time, the lending relationship with well established financial institutions can enhance the planning horizon of the firm and provide positive reputation signals to its suppliers and customers.

The control variables include the beginning of the period share of the sector in total output and two interaction terms capturing the alternative channels already documented in the literature. Assuming that development of financial system benefits from the good contracting environment, the interaction term of financial development with contract intensity might capture the effect of good contracting institution on contract-intensive industries. Thus, we include in our regression the interaction term of rule of law with contract intensity (Nunn 2007) to distinguish between these two different effects. In the same spirit, we include an interaction term of index of external finance dependence and financial development to control for the accentuated effect of financial development on industries dependent on the external finance (Rajan-Zingales 1998).

An important point in this econometric approach is the potential endogeneity of country characteristics like financial development. We use two different approaches to tackle this issue. First, we employ the instrumental variable estimation. Second, we leave the cross-country framework and make use of the natural experiment in the form of branch deregulation in the United States.

In the instrumental variable approach we follow the finance-growth literature and employ the legal origin of countries as instrumental variable. La Porta and al.(1998, 1999) show that the origin of legal system of a country is a strong predictor of its financial development. We instrument the interaction variables of financial development and industry characteristics (contract intensity measure of Nunn or external finance dependence measure of Rajan and Zingales) by the interaction terms of the latter variables with legal origin dummies.[4]

Our database has complex structure with country industry dimension where heteroskedasticity might be present. If heteroskedasticity is present, the GMM estimator is more efficient than simple IV estimator, whereas if heteroskedasticity is not present, the GMM estimator is no worse asymptotically than IV estimator.[5] However, the optimal weighting matrix that is used in efficient GMM procedure is a function of forth moments. Obtaining reasonable estimate of forth moments requires large sample size. As result, the efficient GMM estimator can have poor small sample properties. If in fact the error is homoskedastic, IV would be preferable to efficient GMM in small sample.

[4] We run also estimation with malaria risk from Sachs-Malaney (2002) as additional instrument. The results are qualitatively the same.

[5] Baum and al. (2003) discuss the advantage of using GMM over 2SLS in the presence of heteroscedasticity of the error term.

Even though our sample has moderate size, we perform a heteroskedasticity test proposed by Pagan and Hall(1983). The idea of the test is to check for a relationship between the residuals of the regression and indicator variables that are hypothesized to be related to the heteroskedasticity. Under the null hypothesis of no heteroskedasticity, this statistic is distributed as chi-squared with degrees of freedom equal to the number of indicator variables, irrespective of the presence of heteroskedasticity elsewhere in the system.

The quasi-experimental approach offers another way to tackle the endogeneity in the finance-growth relationship. An influential body of literature uses the process of branch deregulation in the United States in order to establish the causality link from finance to real economy. Before the 1970s, commercial banks in the most of the US states were limited in the geographical scope of the operations even within the state borders. In the 1970s the process of deregulation started in many states by removing first the restrictions on intrastate branching via merging and acquisition followed by elimination of the overall restriction on intrastate branching. The staggered timing of state-level actions to remove branching and interstate banking restrictions creates an ideal framework to test empirically how these regulatory changes and associated with them improvements in the banking sector affect real economy. Jayaratne and Strahan (1996) show that the timing of deregulation were largely independent from the state output growth. This allows to exploit variation across states and time of the growth rates of output to evaluate the effect of the deregulation on the specific industries.

We construct the dummy variable equal to one for states permitting intrastate branching via merging and acquisition and zero otherwise.[6] The growth effects of the deregulation on the contract-intensive industries are estimated using the following specification:

$$G_{ist} = \alpha + \beta D_{st} * CI_i + \gamma X_{ist} + \delta_i + \triangle + \varepsilon_{ist} \quad (2)$$

where G_{ist} is a output growth for the industry i in state s, D_{st} is a dummy for the branch deregulation for state s, CI_i is a contract intensity measure, X_{ist} is a set of controls that include initial industry share in total state (manufacturing) output and

[6] Following the literature we drop the year of deregulation from our estimation and observations for South Dakota and Delaware. Those states have a unique history related to credit card business which could lead to biased estimates (see e.g. Strahan 2003).

the growth rate of gross state product. This specification includes a set of fixed effects $\triangle$.

This specification is generalization of difference in difference approach where the effect of deregulation is estimated as the difference between the change in the growth of the contract-intensive industry before and after deregulation with the difference in growth rate for a control group of industries before and after deregulation. The ability to control for various fixed effects is a major advantage of this empirical approach, as fixed effect dummies can potentially control for wide range of omitted variables. The state fixed effects control for time invariant differences in long run growth rates due to unexplained factors that differ across states, the time fixed effects control for the economic shocks that affect whole economy. The use of fixed effect becomes especially powerful in three dimensional panel, which makes it possible to introduce the interacted fixed effects. The state $\times$ time effects fully absorb any omitted time varying country characteristics, therefore the direct effect of deregulation cannot be recovered when we include it into regression. However we can still observe the differential impact of deregulation across industries within the state.

2.2 Data

2.2.1 International sample

The international industry-level data come from the 2004 UNIDO Industrial Statistics Database which reports data according to the 3-digit ISIC Revision 2 classification. We use data for the period from 1980 till 2004 which covers 28 manufacturing industries for 228 countries. We transform monetary variables into constant international dollars using capital and GDP deflator from Penn World Table (Heston, Summers, and Aten, 2002).

In order to investigate the channel through which financial development affect the sectoral growth, we reconstruct capital stock using standard methodology employed by Hall and Jones (1999). The capital stock in each year t is given by:

$$K_{ict} = (1-\delta)K_{ict-1} + I_{ict}$$

We use a depreciation rate $\delta = 0.08$, and use the standard assumption that initial level of capital stock is equal to:

$$K_{ic0} = \frac{I_{ic0}}{\delta}$$

We compute total factor productivity at the industry level using the following formula:

$$\ln TFP_{ict} = \ln Y_{ict} - (1 - \alpha_{ic}) \ln K_{ict} - \alpha_{ic} \ln L_{ict}$$

where Y_{ict} is the total output, K_{ict} is the capital stock and L_{ict} is the total employment in the sector.

The α_{ic} is computed as the average of the total wage bill divided by value added for sector i for the US data, this will allow us to avoid unduly reduction in our sample to the countries that have available data for value added and wage payment.[7]

We construct cross-sectional panel by averaging variables over period 1980-2004. The initial industry share is constructed using the earliest available data for industry share starting from 1980, doing this we expand the sample of the countries since not all countries report the data for 1980.

The data for financial development is taken from Beck, Demirguc-Kunt, and Levine (2000) database that contains various indicators of financial development across countries and over time. In our main estimation we use two proxies for financial development: private credit to GDP and stock market capitalization to GDP, the standard indicators of financial development in the literature.

The measure of contract intensity was originally developed by Nunn (2007). The idea is that inputs that are not traded on an organized exchange or that do not have reference prices are relationship-specific and, therefore, institutions play an important role in determining the equilibrium level of production of these goods in a country. In order to construct this measure, he uses the United States Input-Output Table for 1997 to identify which intermediate goods are used, and in what proportion, in production of final goods.[8]

Nunn constructs for each final good two measures of the proportion of intermediate inputs that are relationship-specific:

[7] Levchenko, Ranciere and Thoening (2008) who use similiar database to analyze the effect of finacial liberization on industry growth show that results do not change if a country' average labor share of sector i is used instead.

[8] Since highly disaggregated Input-Output Tables exist only for a few countries, Nunn assumes that each country has the same Input-Output Table as the United States. (see Nunn 2007 for further discussion)

$$z_i^{rs1} = \sum_j \theta_{ij} R_j^{neither}$$
$$z_i^{rs2} = \sum_j \theta_{ij} (R_j^{neither} + R_j^{ref\ price})$$

where θ_{ij} is proportion of input j used in the total values of all inputs used in industry i.

$R_j^{neither}$ is the proportion of inputs that are neither sold on an organized exchange nor reference priced according to Rauch classification.[9] $R_j^{ref\ price}$ is the proportion of inputs that are reference priced in a trade publication.

We take the measure of contract intensity from Levchenko (2008) who transforms these measures to make them compatible with 3-digit ISIC Revision 2 classification. In our estimation we use the strongest definition of contract intensity which is measure constructed using only inputs that are neither sold on an organized exchange nor reference priced.

In addition to contract intensity measure, we use measure of external finance dependence introduced by Rajan and Zingales (1998). The measure of external finance dependence is defined as capital expenditure minus cash flow divided by capital expenditure and constructed using US firm level data. The assumption is that this measures captures the technological characteristics of the industries which are similar across countries.

Rather than to use the extrenal finance dependence measure from Rajan and Zingales (1998) which is calculated for a mix of three-digit and four-digit ISIC industries, we adopt the measure of external finance dependence used by Klingebiel, Kroszner and Laeven (2002) who recompute Rajan and Zingales measure for 3 digit ISIC level only.

The data for quality of legal institution, the "rule of law", is taken from the database constructed by Kaufman, Kraay, and Mastruzzi (2005). This variable is the weighted average of several variables that measure perception of individuals of the effectiveness and predictability of the contract enforcement in each country. For our analysis we use the data for 1996 which is the earliest available estimate for this variable.

[9] Rauch (1999) classifies SITC Rev. 2 industries according to three possible types: differentiated products, reference priced, or homogeneous goods.

For instrumental variable regressions, we rely on the data of legal origin from La Porta et al. (1998).

In the Appendix A and B we present data sources as well as summary statistics for the international data we use in our analysis. Appendix C presents correlation matrix for explanatory variables used in the cross-country context.

2.2.2 Sample of US states

The dates of branch deregulation in different US states are taken from Strahan (2003). In the most states, bank deregulation occurred in two successive stages. The first stage of deregulation happened when the restriction of intrastate branching via merging and acquisition (M&A) was abandoned, the second stage of deregulation occurred when overall restrictions on intrastate branching were removed. Since the time span between these dates is relatively short it is difficult to disentangle their effects. Following the literature, we focus on the deregulation of M&A branching when constructing the deregulation dummy.

The data on the Gross State Product for the US states are taken from the Bureau of Economic Analysis, the data are reported according to US SIC industry classification, in current dollars. We transform the data on gross state product to real dollars equivalent using states price deflator.

We restrict our samples to the period from 1978 till 1992 in accordance with the empirical literature on the bank deregulation in the USA. [10] Since the data on the contract intensity are reported using ISIC classification, we apply concordance table that relates these two industrial classification codes. We aggregate those ISIC categories that correspond to the same industry according to US SIC72 classification using simple averaging of the contract-intensity measure.[11]

[10] The data on quantity index that is used to calculate price deflator is available starting from 1977.Jayaratne and Strahan (1996) use data for Gross State Product from 1978-1991

[11] In general, the US SIC72 has broader industry categories than ISIC Rev2.

3 International evidence

3.1 OLS estimation: banks versus stock markets

In the Table 1 we present results of OLS estimations with two proxies of financial development and their interaction term with industry characteristics. [12] In all specifications we include initial industry share and interaction term of industry contract intensity and private credit to GDP, which is our main variable of interest. In the second and third column we include additional control such as interaction term of rule of law with contract intensity and interaction term of external financial dependence with private credit to GDP. In the column 4-6 we augment regressions 1-3 with another proxy of financial development: stock market capitalization and its interaction term with industry characteristics.

In all specifications two variables have expected sign and are statistically significant: the initial industry share and the interaction term of contract intensity and financial development proxied by private credit to GDP. The last is positive and significant at 1% level in all specifications. When both proxies of financial development are put together only private credit to GDP interacted with contract intensity has statistically significant effect on industry growth. This confirms the intuition, that financial intermediaries provide firms with specific services like improved reputation or enhanced planning horizon. Those services are especially important for the contract-intensive sectors and cannot be provided by anonymous stock markets. After this exercise we choose private credit to GDP as the winner of horse race. Therefore, from now we report results only with private credit to GDP.[13]

3.2 Instrumental variable Estimation

In the literature financial development variable is assumed to be endogenous, therefore we cannot rely solely on OLS estimation. Table 2 present results of instrumental variable (GMM) estimation of the equation (1). In all cases our main variable survives

[12] Please notice, since in all regressions we include country and industry fixed effect, the proxy of financial development are absorbed in the country fixed effect.

[13] We run estimations with several proxies of financial development such as stock market turnover, stock value traded, private credit of other financial institution etc. These results are available upon request.

instrumentation, it has positive and significant effect on industry growth.

The results of the Pagan-Hall test is reported at the bottom of the Table 2 after the first stage statistics. The null hypothesis of homoskedasticity is rejected at 1% level of significance. Given this result, in the subsequent analysis we rely on the GMM estimation. We also report the weak instrument test suggested by Stock and Yogo (2002), partial R squared measure suggested by Shea (1997) as well as Hansen/ Sargan test of overindentifying restrictions.

The first stage regression results suggest that our excluded instruments are highly correlated with the endogenous variables. The F statistics from the first stage regressions is around 26, which is above the rule of thumb value of 10 proposed by Yogo and Stock for weak instrument test in the presence of one endogenous variable. The Cragg-Donald statistic which is suggested by Stock and Yogo in the presence of several endogenous regressors in the regression is also reported. [14] Both tests reject null hypothesis of weak instruments.

The Sargan/Hansen test of overidentifying restrictions checks the validity of the instruments. The null hypothesis is that instruments are uncorrelated with error term. The Sargan/Hansen test rejects null hypothesis at 10% level of significance in two out of three specifications.[15] A rejection of the null hypothesis implies that the instruments do not satisfy the required orthogonality conditions either because they are not truly exogenous or because they are incorrectly excluded from the regression. La Porta and al (2002) recognize that legal origin can influence different spheres of economic and political life of the country which makes them dangerous to use as instruments.

We try to mitigate this problem by adding additional controls in our specification. to account for alternative channels through which legal origin can affect the industry growth. We attempt to control for these alternative channels by including as the controls the interaction terms of industry dummies with log real income per worker to control for the possibility that, for reason unrelated to financial development, high income countries specialize in certain industries.

The results of the estimation are reported in the last three columns of the Table 2. In all three specifications the coefficient of the interaction term of financial development

[14] The critical values of the Cragg-Donald statistics is tabulated in the Appendix D for the sake of saving space.

[15] In the specification that includes interaction term of rule of law and contract intensity the null hypothesis of orthogonality cannot be rejected at 10% level of significance.

and contract intensity remain significant and positive. The Hansen/ Sargan statistics clearly improves: now we cannot reject null hypothesis at 10 % level of significance in two out of three specifications. In the subsequent analysis we estimate the specifications with and without interaction term of industry dummies with real GDP per worker.

3.3 Decomposition of Sources of Growth

In this section we would like to decompose industrial growth into its components. The industry can grow because new establishments are added to the industry or because existing establishments increase in size. In the Table 3 and 4 we present the results of decomposition of the growth into the growth per establishment and into the growth in number of establishments. As it can be seen, the financial development has positive and statistically significant impact on the growth in number of establishment while it fails to have statistically significant impact on the growth in output per establishment. Thus, financial development facilitates new firms creation in the contract-intensive industries. This result is quite intuitive: newly established firms in contract-intensive industries strongly depend on reputation and long-term planning horizon that come along with bank credits. The firms existing for a longer period of time usually already possess established network of suppliers and do not rely so heavily on reputation signals coming from bank loans.

As in standard growth accounting framework, growth in total production may come from increased employment, capital accumulation, and growth in total factor productivity. In Table 5 , Table 6 and Table 7 we investigate the later decomposition. In the columns 4-6 we present the baseline estimation, in the last three we present the results of GMM estimation with interaction term of industry dummies with real GDP per worker of the country. We can see that higher level of financial development has positive and statistically significant impact on the growth rate of capital accumulation for contract-intensive industries (see columns 4-9, Table 5). The coefficient estimate is significant at 1% level but the estimated size of impact is a bit smaller than that we obtained in our main specification (see Table 2).

For the specifications where we use growth rate of employment as dependent variable, results are less clear cut (see column 4-9, Table 6). The coefficient of the interaction term of financial development and contract intensity while always positive, stays significant only in the absence of the interaction variable of extrenal finance dependence measure and financial development. These results might be indication of multicollinearity problem when two endogenous variables enter into regression. The coefficient estimate for interaction term of contract intensity and financial development drops in size and loses significance when we introduce interaction variable of external finance dependence and financial development. Since the instruments are always interaction variables of industry characteristics (contract intensity or external finance dependence) with legal origins, this may produce multicollinearity problem when two endogenous variable are instrumented by similar set of instruments.

Table 7 presents the estimation results when TFP growth is taken as dependent variable. The coefficient at the our main variable of interest is not significant in both OLS and GMM estimations. One reason why we do not get any significant impact on the TFP is that the TFP estimate is subject to measurement error which may result in the inconsistent estimates for the explanatory variables.

4 Evidence from US Branch Deregulation

The analysis based on the international data suggests that financial development particularly promotes the contract-intensive industries. In order to further investigate this issue we check our prediction using the data from the US bank deregulation.

The banking industry experienced significant changes after branch deregulation. The banking sector consolidated as large bank holding companies acquired banks and converted existing bank subsidiaries into branches. Small banks lost market share and regional bank market experienced significant entry of new banks. These changes in the banking sector became the source of improved efficiency of the banking sector. Entry of new banks and consolidation provided an important selection mechanism to replace less efficient banks. The formation of larger bank organizations allowed to explore economies of scale and to gain better diversification via expansion of branch network. The average costs of intermediation decreased via better loan monitoring and screening.[16] All these

[16] Jayaratne and Strahan (1996) analyze the quality of the banks loans before and after deregulation. They show that intrastate deregulation improves the quality of the bank loan portfolio. In addition, they show that quantity of loans granted to "Insiders" (corporate executive, principal shareholders) decreases significantly after branching reform. The improvement in the bank loan after deregulation and no consistent increase in lending after branch reform suggest that bank monitoring and screening improvement are the key to the observed growth increases.

changes translated into overall higher growth of the real sectors of economies. (See for example, Jayaratne and Strahan 1996, Krozner and Strahan 1999, Strahan and Black 2002, Strahan 2003)

The impact of branch deregulation on contract-intensive industries is not clear from theoretical point of view. On one hand, the contract-intensive industries may rely on specific long-term relationships with regional banks to decrease their contracting and operational costs. The knowledge of the industries should allow the local banks to provide fine-tuned banking services to their customers. The branch deregulation decreases monopoly power of the local banks and may destroy incentive of the banks to forge long term relationship with the businesses. Petersen and Rajan (1995) develop the model where market power of the banks helps new businesses. The monopolistic banks can subsidize borrowers during some periods because they can extract rents during other times. In competitive markets, however, firms have access to alternative sources of credit, so banks cannot offer low prices early on because they lack the market power to recover those investment later. On the other hand, Boot and Thakor (2000) argue that the bank competition may raise the rewards to activities that allow to differentiate themselves from other lenders, which raise the incentive to invest in relationship. In the same spirit, if the banking concentration simply results in lower credit availability and lack of efficiency, then competition results in provision of better banking services which should benefit contract-intensive industries.

The empirical results are mixed as well. Strahan and Black (2002) show that branch deregulation benefits small and young firms that traditionally depend on relationship lending. They find that rate of new incorporations in state increased significantly after deregulation. Thus, the diversification benefits of bank size which reduce delegated monitoring costs, outweight the possible comparative advantage that small banks may have in forging long term relationships with small businesses. Ceterelli and Gambera (2001) show that external finance dependent industries grow faster in countries with more concentrated banking system than they do in countries with more open and competitive banking sector. Similarly to small and new enterprises, the firms in contract-intensive industries also disproportionately depend on a committed long-term relationship with their bank. In this context a pro-growth effect of branch deregulation on contract-intensive industries would suggest that bank competition has an overall positive effect on the relationship lending.

Table 8 presents the estimation results of the equation 2. In all specifications we include the initial share of the industry in state output to control for the convergence effect. Following the literature on branch deregulation, we estimate the model using ordinary least square (OLS) and weighted least square (WLS) estimation, with weights proportional to the size of the state economy at the beginning of the period. We use WLS in order to deal with measurement error which is likely to be greater for smaller states. In all cases we report heteroskedasticity-robust standard errors.

In the first and fourth column we report the results of OLS and WLS estimation controlling for time, industry and state fixed effects. In both columns the interaction term of deregulation dummy and contract intensity measure is positive and significant at 10%. In the second and fifth column we add the growth of state output into the set of regressors. This is to control for the possibility that the timing of deregulation is affected by economic performance of the state. Our results survive this additional control. Finally, in third and sixth coumn we report the results of the regression controlling for state$\times$time and industry fixed effects. The inclusion of the interacted state$\times$time effects controls for any omitted time-varying state characteristics. The coefficient on our main variable remains positive and significant. However, in this specification we cannot identify the direct effect of branch deregulation on industrial growth, as it is absorbed by the state$\times$time fixed effects.

5 Conclusion

The recent trade literature drew attention to the role institutions like rule of law play as promoter of the contract-intensive industries. The empirical results in this paper suggest, that financial development might be at least as important for the growth of industries using relationship-specific inputs.[17] A well-developed banking sector seems especially important in this regard. This is not to say, that institutions do not play a potentially important role in the development of contract-intensive industries. An influential strand of literature (e.g. Levine-Loyaza-Beck 2000) argues, that good institutions including contract enforcement can boost financial development. One possible interpretation of our results could be that the superior institutions promote contract-intensive industries

[17] To be precise, the results in this paper are not directly comparable with those in the trade literature. Our dependent variable is the growth of industrial output, while Nunn (2007) and Levchenko (2007) focus on the export performance of industries.

mostly indirectly via their impact on level of financial development.

Needless to say, much more work is needed to disentangle the effects of finance and institutions on the industries using relationship-specific inputs. First, there is an issue of possible nonlinearities between contract-enforcement and finance, briefly raised by Levine et al (2000). The theoretical literature explains the very existence of financial intermediaries as the consequence of market imperfections (e.g. Boyd and Prescott 1986). In a world with perfect contract enforcement, there would be less reason to have financial intermediaries on the first place. Second, a third common factor like culture or human capital can drive both financial and institutional development. We leave those issues for further research.

References

[1] Acemoglu, Daron, Pol Antràs and Elhanan Helpman, 2007, "Contracts and Technolog Adoption", American Economic Review,

[2] Acemoglu, Daron, and Simon Johnson, 2005, Unbundling Institutions, Journal of Political Economy 113, pp.949-995.

[3] Acemoglu, Daron, James A. Robinson and Simon Johnson, (2001), "The Colonial Origins of Comparative Development: An Empirical Investigation", American Economic Review, 91, pp. 1369-1401.

[4] Daron Acemoglu, Simon Johnson, and Todd Mitton, "Determinants of Vertical Integration: Financial Development and Contracting Costs", forthcoming, Journal of Finance

[5] Aghion, Philippe and Patrick Bolton, 1987, "Contracts as a Barrier to Entry", American Economic Review 77, pp.388-401.

[6] Aghion, Philippe and Jean Tirole, 1997, "Formal and Real Authority in Organizations", Journal of Political Economy 105, pp.1-2

[7] Antràs, Pol, 2003, Firms, Contracts, and Trade Structure, Quarterly Journal of Economics 118, pp. 1375-1418.

[8] Baker, George, Robert Gibbons, and Kevin J. Murphy, 2002, "Relational Contracts and the Theory of the Firm," Quarterly Journal of Economics, 117, pp. 39-83.

[9] Baker, George and Thomas Hubbard, 2001, "Empirical Strategies in Contract Economics: Information and the Boundary of the Firm", American Economic Review 91, pp. 189-194.

[10] Barro, Robert J. and Jong-Wha Lee, 2000, "International Data on Educational Attainment: Updates and Implications",CID Working Paper No. 42

[11] Baum, Christopher F., Mark E. Schaffer and, Steven Stillman, 2003 "Instrumental variables and GMM: Estimation and testing," Stata Journal, Stata Corp LP, vol. 3(1), pp 1-31.

[12] Beck,Thorsten, Asli Demirgüç-Kunt and Ross Levine, 2000, "A New Database on Financial Development and Structure," World Bank Economic Review 14, pp. 597-605.

[13] Beck, Thorsten & Levine, Ross and Loayza, Norman, 2000, "Finance and the sources of growth," Journal of Financial Economics, Elsevier, vol. 58(1-2), pp. 261-300.

[14] Beck, Thorsten & Levine, Ross and Levkov, Alexey, 2007, "Big bad banks ? the impact of U.S. branch deregulation on income distribution," Policy Research Working Paper Series 4330, The World Bank

[15] Beck, Thorsten, Levine, Ross and Loayza, Norman, 2000, "Financial intermediation and growth: Causality and causes," Journal of Monetary Economics, vol. 46(1), pp. 31-77

[16] Black, Sandra E. and Strahan, Philip E., 2002, "Entrepreneurship and Bank Credit Availability," Journal of Finance, American Finance Association, vol. 57(6), pp. 2807-2833

[17] Bonfiglioli, Alessandra, 2007, "Financial Integration, Productivity and Capital Accumulation," UFAE and IAE Working Papers 680.07.

[18] Boot, W. A. Arnoud, 2000, Relationship Banking: What do we know?", Journal of Financial Intermediation, 9, pp. 7-25.

[19] Boot, W. A. Arnoud and. Thakor V. Anjan , 2000, "Can Relationship Banking Survive Competition?," Journal of Finance,vol. 55(2), pp. 679-713

[20] Nicola Cetorelli and Philip E. Strahan, 2006, "Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets," Journal of Finance, American Finance Association, vol. 61(1), pp 437-461

[21] Cetorelli, Nicola, and Michele Gambera, (2001), "Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data," Journal of Finance, vol. 56(2), pp 617-648.

[22] Diamond,Douglas, W., 2004, "Committing to Commit: Short-term Debt When Enforcement is Costly", Journal of Finance 59, 1447-1479.

[23] Diamond, Douglas W, 1984. "Financial Intermediation and Delegated Monitoring," Review of Economic Studies, Blackwell Publishing, vol. 51(3), pp. 393-414, July.

[24] Diamond,Douglas, W., and Rajan, Raghuram , 2005, "Liquidity Shortages and Banking Crises", Journal of Finance 60, 615-647.

[25] Diamond,Douglas, W., 2004. "Presidential Address, Committing to Commit: Short-term Debt When Enforcement Is Costly," Journal of Finance, American Finance Association, vol. 59(4), pp. 1447-1479, 08.

[26] Fama, F.,Eugene "What's Different About Banks?" ,1985, Journal of Monetary Economics,15(1), pp. 29-39.

[27] Glaeser, Edward L., Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, (2004), "Do Institutions cause Growth?", Journal of Economic Growth, pp. 271-303.

[28] Grossman, Sanford, and Oliver Hart, 1986, "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration", Journal of Political Economy 94, pp. 691-719.

[29] Hansen, Lars Peter, 1982, "Large Sample Properties of Generalized Method of Moments Estimators", Econometrica 50, pp. 1029-1054.

[30] Hart, Oliver, and John Moore, 1990, "Property Rights and the Nature of the Firm", Journal of Political Economy 98, pp. 1119-1158.

[31] Hart, Oliver, and Jean Tirole, 1990, "Vertical Integration and Market Foreclosure", Brookings Papers on Economic Activity Special Issue, 205-276.

[32] Hall, Robert, and Chad Jones, 1999, "Why Do Some Countries Produce So Much More Output per Worker then Others," Quarterly Journal of Economics, 114, pp. 83-116.

[33] Heston, Alan, Robert Summers, and Bettina Aten, 2002, "Penn World Table Version 6.1", Center for International Comparisons at the University of Pennsylvania (CICUP).

[34] Holmstrom, Bengt, and Jean Tirole, 1989, "The Theory of the Firm, in The Handbook of Industrial Economics", Vol. I, Schmalensee, Richard, and Robert Willig, eds., Elsevier.

[35] Huang, R.,Rocco, 2007, "The Real Effect of Bank Branching Deregulation: Comparing contiguous counties across U.S. state borders", Journal of Financial Economics, Vol.87(3):678-705

[36] Jayaratne, Jith and Strahan, Philip E., 1997, "The Benefits of Branching Deregulation." Economic Policy Review, Vol. 3, No. 4.

[37] Jayaratne, Jith and Strahan, Philip E., 1996, "The Finance-Growth Nexus: Evidence from Bank Branch Deregulation",The Quartely Journal of Economics, Vol.111, pp 639-670.

[38] Kaufmann,Daniel, Aart Kraay and Massimo Mastruzzi, 2008, "Governance Matters VII: Governance Indicators for 1996-2007". World Bank Policy Research June 2008.

[39] Klingebiel, Daniela, Randall Kroszner, and Luc Laeven, 2005, "Financial Crises, Financial Dependence, and Industry Growth"

[40] Kroszner,Randall, and Strahan, Philip, 1999, "What Drives Deregulation? Economics and Politics of the Relaxation of Bank Branching Restrictions," Quarterly Journal of Economics, pp.1437-67.

[41] La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and, Robert Vishny, 1997, "Legal Determinants of External Finance," Journal of Finance, LII, pp. 1131–1150.

[42] ——,1998, “Law and Finance,” Journal of Political Economy, CVI pp.1113–1155.

[43] ——, 1999, “The Quality of Government,” Journal of Law, Economics, and Organization, XV, pp.222–279.

[44] Levchenko,Andrei, 2007, “Institutional Quality and International Trade", Review of Economic Studies, 74:3, pp.791-819.

[45] Levchenko, Andrei, Ranciere, Romain and Thoenig, Mathias "Growth and Risk at the Industry Level: the Real Effects of Financial Liberalization", Forthcoming, Journal of Development Economics.

[46] Levchenko, Andrei, 2008, "International Trade and Institutional Change", mimeo, University of Michigan.

[47] Levine, Ross, 1999. "Law, Finance, and Economic Growth," Journal of Financial Intermediation, Elsevier, vol. 8(1-2), pp. 8-35,

[48] ——,2005, “Finance and Growth: Theory and Evidence.”, Handbook of Economic Growth, Eds:Philippe Aghion and Steven Durlauf, The Netherlands: Elsevier Science.

[49] Macchiavello, Rocco, 2008, "Contractual Institutions, Financial Development and Vertical Integration: Theory and Evidence"

[50] Maskin, Eric and Tirole, Jean, 1999, "Two Remarks on the Property-Rights Literature," Review of Economic Studies, vol. 66(1), pp. 139-49

[51] Nunn, Nathan, 2007, "Relationship-Specificity, Incomplete Contracts, and the Pattern of Trade," The Quarterly Journal of Economics, MIT Press, 122(2), pp 569-600, 05.

[52] Ongena, Steven R.G. and Smith, David C, 1998, "Bank Relationships: A Review."

[53] Pagan Adrian R. and Hall, Anotony. D., 1983, "Diagnostic tests as residual analysis," Econometric Reviews, Taylor and Francis Journals, vol. 2(2), pp. 159-218.

[54] Petersen, Mitchell A., 1999, "Banks and the Role of Lending Relationships: Evidence from the U.S. Experience"

[55] Petersen, Mitchell A.and Raghuram Rajan, 1995, "The Effect of Credit Market Competition on Lending Relationships," The Quarterly Journal of Economics, vol. 110(2), pp.407-43.

[56] Petersen, Mitchell A., and Raghuram Rajan, 1994, " The Benefits of Lending Relationships: Evidence from Small Business Data," Journal of Finance, vol. 49(1), pp. 3-37.

[57] Rajan, Raghuram and Luigi Zingales, 1998, "Financial Dependence and Growth",American Economic Review, 88(3), 559-86.

[58] Rauch, James E., 1999, "Networks Versus Markets in International Trade," Journal of International Economics 48(1)),pp 7-35

[59] Levine, Ross and Zervos, Sara, 1998, "Stock Markets, Banks, and Economic Growth," American Economic Review, vol. 88(3), pp. 537-58

[60] Robinson, Joan, 1952, "The Rate of Interest and other essays", London: Macmillan

[61] Sachs Jeffrey and Pia Malaney, 2002,"The Economic and Social Burden of Malaria", Nature, Vol. 415, no. 6872

[62] Schumpeter Joseph A, 1912, "Theorie der wirtschaftlichen Entwicklung", Lepzig, Germany: Dunker & Humblot

[63] Shea, John S, 1997, "Instrument Relevance in Multivariate Linear Models: A Simple Measure", Review of Economics and Statistics, Vol. 79, no. 2, pp. 348-352.

[64] Stock , James H.and Motohiro Yogo, 2002, "Testing for Weak Instruments in Linear IV Regression," NBER Technical Working Papers 0284, National Bureau of Economic Research, Inc.

[65] Stock, James H ., Wright, Jonathan H and Motohiro Yogo, 2002, "A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments," Journal of Business and Economic Statistics, American Statistical Association, vol. 20(4), pp 518-29.

[66] Strahan, Philip, "The real effects of US banking deregulation", 2003, Federal Reserve Bank of St.Louis Review.

[67] United Nations Industrial Development Organization, 2006, "Industrial Statistics Database", CD-ROM.

[68] von Thadden, Ernst-Ludwig, 1995, "Long-Term Contracts, Short-Term Investment and Monitoring," Review of Economic Studies, vol. 62(4), pp 557-75

Appendix A: Data Sources

Variables	Sources
Financial Development Variables/ stock market capitalisation, private credit of the banks	Beck,Thorsten, Asli Demirgüç-Kunt and Ross Levine, (2000)
Capital, GDP deflator, Real GDP per Worker	Heston, Alan, Robert Summers, and Bettina Aten, (2002), "Penn World Table Version 6.1"
Contract intensity	Levchenko, Andrei, (2008)
Dependence on external finance	Klingebiel, Daniela, Randall Kroszner, and Luc Laeven, (2007)
Rule of Law	Kaufmann,Daniel, Aart Kraay and Massimo Mastruzzi (2008).
Legal origin and other instrumehts	Glaeser, Edward L., Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, (2004)
Industry variables	UNIDO database

Appendix B: Summary statistics

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
contract_intensity	Contract intensity	2772	0.487179	0.20216	0.058	0.859
RZ_fin_dep	Dependence on external finance	2772	0.268571	0.35221	-0.45	1.14
growth	Growth of output	2449	0.01235	0.13559	-1.68474	1.592252
growth_TFP	Growth of TFP	1906	-0.00829	0.13373	-1.81938	1.526246
growth_capital	Growth of capital	1951	0.042284	0.09964	-0.63703	1.329029
growth_employees	Growth of employment	2555	0.000926	0.10049	-0.97985	1.609438
growth_establishment	Growth of number of establishment	2414	0.041848	0.12184	-2.03489	0.950536
growth_output_etsablishment	Growth output per establishment	2276	-0.03045	0.16128	-1.17367	1.042946
growth_value_added	Growth of value added	2297	0.006968	0.21599	-7.69062	1.495028
initial_industry_share	Initial Industry Share	2562	0.040806	0.06609	4.40E-06	1
initial_ln_rgdpwok	Initial Log Rea GDP per Worker	2716	9.463226	1.04123	7.001464	11.6478
initial_pcrdbgdp	Initial Private Credit of the Banks to GDP	2660	0.310849	0.25448	0.013926	1.429799
initial_stmktcap	Initial Stock Market Capitalisation to GDP	2492	0.186742	0.28003	0.000504	1.417954
legor_fr	Dummy for French legal origin	2850	0.44807	0.49738	0	1
legor_ge	Dummy for German legal origin	2850	0.049825	0.21762	0	1
legor_sc	Dummy for Scandinavian legal origin	2850	0.049123	0.21616	0	1

Appendix B: Summary statistics (continue)

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
legor_so	Dummy for Socialistic legal origin	2850	0.182807	0.38658	0	1
legor_uk	Dummy for Common Law	2850	0.270175	0.44413	0	1
malfal	% of population at risk of malaria	2785	0.206543	0.35785	0	1
pcrdbgdp_fin_dep	Private Credit of the Bank to GDP multiplied by Dependence on external finance	2660	0.083485	0.15713	-0.64341	1.629971
pcrdbgdp_intensity	Private Credit of the Bank to GDP multiplied by Contract Intensity	2660	0.151439	0.14821	0.000808	1.228197
stmktcap__fin_dep	Stock Market Capitalisation to GDP multiplied by Dependence on external finance	2492	0.050154	0.14038	-0.63808	1.616467
stmktcap__intensity	Stock Market Capitalisation to GDP multiplied by Contract Intensity	2492	0.090977	0.15245	2.92E-05	1.218022
Law__intensity__96	Rule of Law interacted with Contract Intensity	2744	0.270971	0.15205	0.0116	0.786844

Appendix C: Correlation matrix

Variable	pcrdbgdp_intensity	pcrdbgdp_fin_dep	legor_uk_fin_dep	legor_fr_fin_dep	legor_ge_fin_dep	legor_sc_fin_dep
pcrdbgdp_intensity	1					
pcrdbgdp_fin_dep	0.5466	1				
legor_uk_fin_dep	0.0737	0.3113	1			
legor_fr_fin_dep	0.0473	0.3599	-0.1516	1		
legor_ge_fin_dep	0.3078	0.4565	-0.047	-0.0637	1	
legor_sc_fin_dep	0.0304	0.1301	-0.047	-0.0637	-0.0197	1
legor_so_fin_dep	-0.0464	0.1121	-0.0831	-0.1125	-0.0349	-0.0349
legor_uk_intensity	0.1049	0.0632	0.6259	-0.2501	-0.0775	-0.0775
legor_fr_intensity	0.0622	0.0439	-0.2704	0.5838	-0.1136	-0.1136
legor_ge_intensity	0.458	0.247	-0.0725	-0.0982	0.6649	-0.0305
legor_sc_intensity	0.0404	0.0244	-0.0725	-0.0982	-0.0305	0.6649
legor_so_intensity	-0.0817	-0.0383	-0.132	-0.1788	-0.0554	-0.0554

Appendix C: Correlation matrix

Variable	legor_so_fin_dep	legor_uk_intensity	llegor_fr_intensity	legor_ge_intensity	legor_sc_intensity	legor_so_intensity
pcrdbgdp_intensity						
pcrdbgdp_fin_dep						
legor_uk_fin_dep						
legor_fr_fin_dep						
legor_ge_fin_dep						
legor_sc_fin_dep						
legor_so_fin_dep	1					
legor_uk_intensity	-0.137	1				
legor_fr_intensity	-0.2007	-0.4461	1			
legor_ge_intensity	-0.0538	-0.1197	-0.1753	1		
legor_sc_intensity	-0.0538	-0.1197	-0.1753	-0.047	1	
legor_so_intensity	0.6475	-0.2178	-0.3189	-0.0856	-0.0856	1

Table 1: Industry growth - OLS

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES						
initial_industry_share	-0.427163*	-0.460688**	-0.429104*	-0.180169**	-0.181217**	-0.183024**
	0.222520	0.233692	0.222907	0.072928	0.073780	0.073150
pcrdbgdp_intensity	0.168622***	0.140288***	0.153830***	0.166036***	0.157208***	0.164891***
	0.051010	0.049353	0.051150	0.059935	0.059140	0.061695
Law_intensity		0.077823			0.040964	
		0.081810			0.090876	
pcrdbgdp_fin_dep			0.022888			0.001477
			0.021029			0.025216
stmktcap_intensity				-0.016778	-0.026171	-0.027906
				0.041026	0.042170	0.041559
stmktcap_fin_dep						0.017635
						0.018114
Constant	0.082217*	0.078562*	0.083147*	0.030840**	0.024652	0.031715**
	0.044886	0.045507	0.045122	0.014685	0.018362	0.014811
Observations	2341	2318	2341	2164	2164	2164
R^2	0.259	0.262	0.259	0.260	0.260	0.260

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Industry growth - IV

	(1)	(2)	(3)	(4)	(5)	(6)
	GMM	GMM	GMM	GMM	GMM	GMM
VARIABLES						
initial_industry_share	-0.377477*	-0.569208***	-0.212145	-0.466718**	-0.599841***	-0.310757*
	0.195828	0.219374	0.186856	0.197717	0.215415	0.187858
pcrdbgdp_intensity	0.170650***	0.139658**	0.142058**	0.145903**	0.127298**	0.134117**
	0.065013	0.063551	0.067147	0.065306	0.064518	0.065346
Law_intensity		0.144030**			0.161830	
		0.068355			0.103474	
pcrdbgdp_fin_dep			0.011845			-0.012591
			0.033936			0.034155
Constant	0.005809	0.063716	-0.037297	0.220929*	0.272501**	0.148464
	0.092316	0.097387	0.091017	0.133823	0.138852	0.130621
real GDP per workerX industry dummies				Yes	Yes	Yes
Observations	2341	2318	2341	2341	2318	2341
R^2	0.253	0.257	0.247	0.272	0.276	0.269
F stat of excl instr	26.69	27.16	13.38	36.88	36.81	18.43
Cragg-Donald F statistic	104.7	93.36	47.20	122.3	100.3	58.17
Partial R2 Shea	0.159	0.148	0.153	0.183	0.156	0.179
p value of Hansen test	0.053521	0.160306	0.004721	0.120656	0.173590	0.034750

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Pagan-Hall general test statistic : 286.733 Chi-sq(124) P-value = 0.0000

Table 3: Decomposition of Growth, dependent variable growth of number of establishments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	OLS	GMM	GMM	GMM	GMM	GMM	GMM
VARIABLES									
initial_industry_share	-0.197946*	-0.212214*	-0.199160*	-0.212961**	-0.221677**	-0.193840**	-0.223257**	-0.237089**	-0.200478**
	0.103941	0.108682	0.103937	0.100611	0.106184	0.094494	0.105054	0.110956	0.098416
pcrdbgdp_intensity	0.107322***	0.087360*	0.097294**	0.175959***	0.180838***	0.137834**	0.138937**	0.139297**	0.111086**
	0.039274	0.051284	0.041107	0.059498	0.065757	0.059522	0.054783	0.055825	0.055162
Law_intensity		0.058494			-0.007903			-0.005256	
		0.068142			0.059561			0.083217	
pcrdbgdp_fin_dep			0.015769			0.064136*			0.055781
			0.018663			0.037680			0.041159
Constant	0.053204***	0.048130**	0.053806***	0.113183**	0.118414**	0.108474*	1.011853***	1.023722***	0.982848***
	0.017189	0.019134	0.017235	0.056344	0.059146	0.056323	0.215234	0.220718	0.212311
real GDP per workerX industry dummies							Yes	Yes	Yes
Observations	2291	2268	2291	2291	2268	2291	2243	2220	2243
R^2	0.407	0.407	0.407	0.404	0.404	0.404	0.418	0.418	0.415
Partial R2 Shea				0.191	0.168	0.190	0.170	0.147	0.169
Cragg-Donald F statistic				127.8	107.9	60.40	107.0	89.38	52.65
F stat of excl instr				37.70	38.12	18.86	30.94	30.75	15.46
p value of Hansen test				0.228720	0.123042	0.315349	0.144656	0.067501	0.299569

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4: Decomposition of Growth, dependent variable growth of output per establishment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	OLS	GMM	GMM	GMM	GMM	GMM	GMM
VARIABLES									
initial_industry_share	-0.201495	-0.214146	-0.202535	-0.219937*	-0.247939*	-0.188124	-0.235753**	-0.247004**	-0.207736*
	0.129893	0.138153	0.130006	0.121886	0.132614	0.120722	0.114575	0.123936	0.112617
pcrdbgdp_intensity	0.105794*	0.131356**	0.095952	0.063178	0.057188	0.065624	0.053524	0.060523	0.063445
	0.057488	0.063425	0.059858	0.053595	0.058932	0.063065	0.059075	0.064002	0.063996
Law_intensity		-0.054197			0.019933			-0.040865	
		0.083478			0.075551			0.111443	
pcrdbgdp_fin_dep			0.015506			-0.007091			-0.019748
			0.025737			0.037152			0.036605
Constant	0.006918	0.017439	0.007469	-0.055501	-0.046433	-0.060872	-0.326692*	-0.317752*	-0.345655**
	0.026883	0.029535	0.026977	0.086618	0.087796	0.087040	0.166687	0.168437	0.164597
Observations	2196	2173	2196	2196	2173	2196	2196	2173	2196
R^2	0.359	0.359	0.359	0.357	0.357	0.357	0.377	0.377	0.376
Cragg-Donald F statistic				91.38	82.15	42.03	109.8	89.97	52.87
F stat of excl instr				23.30	23.74	11.67	31.41	31.29	15.69
Partial R2 Shea				0.150	0.141	0.147	0.176	0.151	0.175
p value of Hansen test				0.214	0.108	0.0872			

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5:Decomposition of Growth, dependent variable growth of capital

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	OLS	GMM	GMM	GMM	GMM	GMM	GMM
VARIABLES									
initial_industry_share	-0.146491***	-0.152434***	-0.146861***	-0.145721***	-0.149677***	-0.140422***	-0.148025***	-0.159128***	-0.144397***
	0.041040	0.044371	0.041057	0.039749	0.042981	0.039963	0.037593	0.042016	0.037652
pcrdbgdp_intensity	0.052756	0.029748	0.048862	0.140101***	0.128564***	0.106587**	0.142905***	0.134081***	0.119095***
	0.036535	0.040118	0.036687	0.044917	0.047306	0.044013	0.046957	0.046279	0.045462
Law_intensity		0.095626*			0.018706			0.040702	
		0.050568			0.057486			0.072989	
pcrdbgdp_fin_dep			0.006179			0.040846			0.022131
			0.017390			0.026859			0.026184
Constant	0.054229***	0.040625***	0.054442***	-0.028219**	-0.028709**	-0.028803**	0.259873***	0.240824***	0.243897***
	0.009346	0.011093	0.009326	0.012643	0.014515	0.012609	0.089282	0.091095	0.089291
real GDP per workerX industry dummies							Yes	Yes	Yes
Observations	1883	1861	1883	1883	1861	1883	1883	1861	1883
R^2	0.336	0.343	0.336	0.332	0.340	0.328	0.349	0.357	0.344
Partial R2 Shea				0.135	0.132	0.133	0.169	0.144	0.167
F stat of excl instr				16.81	17.36	8.421	29.81	29.80	14.88
Cragg-Donald F statistic				69.13	64.28	31.61	88.80	72.32	42.32
p value of Hansen test				0.786644	0.760398	0.031309	0.758388	0.836386	0.065818

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6: Decomposition of Growth, dependent variable growth of employment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	OLS	GMM	GMM	GMM	GMM	GMM	GMM
VARIABLES									
initial_industry_share	-0.230415*	-0.245140*	-0.233498*	-0.286295**	-0.296793**	-0.221833*	-0.342885***	-0.331658**	-0.296563**
	0.130955	0.138330	0.131002	0.121787	0.133504	0.117037	0.123189	0.135212	0.119214
pcrdbgdp_intensity	0.062631*	0.059110*	0.041577	0.105409**	0.113016**	0.050555	0.085293*	0.094783*	0.062164
	0.034028	0.034105	0.034034	0.045976	0.049677	0.047126	0.047055	0.049000	0.051874
Law_intensity		0.011494			-0.016936			-0.070734	
		0.059962			0.058815			0.077712	
pcrdbgdp_fin_dep			0.032877*			0.050631**			0.010009
			0.017422			0.025318			0.028589
Constant	0.056661**	0.058411**	0.058061**	0.163916***	0.172525***	0.133103**	0.264133	0.262415	0.145436
	0.026560	0.027786	0.026654	0.060468	0.063428	0.058274	0.160816	0.163527	0.156287
real GDP per workerX industry dummies							Yes	Yes	Yes
Observations	2397	2374	2397	2397	2374	2397	2349	2326	2349
R^2	0.237	0.239	0.237	0.231	0.233	0.231	0.253	0.257	0.247
Cragg-Donald F statistic				139.4	116.3	65.34	120.0	98.19	57.78
p value of Hansen test				0.099528	0.047890	0.000104	0.214153	0.179159	0.003455
F stat of excl instr				40.83	41.37	20.39	36.15	36.14	18.06
Partial R2 Shea				0.197	0.172	0.193	0.179	0.153	0.177
p value of Hansen test				0.099528	0.047890	0.000104	0.214153	0.179159	0.003455

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7:Decomposition of Growth, dependent variable TFP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	OLS	GMM	GMM	GMM	GMM	GMM	GMM
VARIABLES									
initial_industry_share	-0.218403	-0.246000	-0.218740	-0.135688	-0.224633	-0.139855	-0.211098	-0.228750	-0.209261
	0.212291	0.227553	0.212563	0.177942	0.221340	0.176203	0.185902	0.210803	0.182760
pcrdbgdp_intensity	0.089042*	0.096470*	0.085523*	-0.015173	-0.010759	0.007866	-0.003632	0.001125	0.018299
	0.051629	0.049578	0.050359	0.043991	0.043455	0.043963	0.044687	0.045021	0.044056
Law_intensity		-0.039307			0.052740			0.009792	
		0.072918			0.066877			0.097246	
pcrdbgdp_fin_dep			0.005591			-0.036266			-0.038277
			0.019016			0.028320			0.029603
Constant	0.021558	0.033936	0.021754	0.070629	0.102054	0.072699	-0.145263	-0.135535	0.071040
	0.039491	0.040545	0.039633	0.106925	0.119164	0.105318	0.149988	0.152899	0.124026
real GDP per workerX industry dummies							Yes	Yes	Yes
Observations	1841	1819	1841	1841	1819	1841	1841	1819	1841
R^2	0.159	0.161	0.159	0.155	0.157	0.152	0.182	0.184	0.181
Cragg-Donald F statistic				67.52	61.50	29.90	85.01	69.34	40.00
F stat of excl instr				16.58	17.20	8.347	29.57	29.58	14.78
Partial R2 Shea				0.135	0.129	0.132	0.166	0.141	0.164
p value of Hansen test				0.801564	0.674279	0.653574	0.801140	0.592076	0.535007

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 8 :Intrastate Branching Deregulation and growth 1978-1992 Panel Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	WLS	WLS	WLS
VARIABLES						
initial_industry_share	-0.485104***	-0.485002***	-0.483637***	-0.481768***	-0.481675***	-0.480461***
	0.157974	0.157367	0.163381	0.155217	0.154609	0.160950
growth_total_gsp_r		0.261070***			0.281365***	
		0.090301			0.088037	
deregulation	-0.011614	-0.014521		-0.011621	-0.015019	
	0.016038	0.016095		0.015832	0.015877	
contr_intens_deregulation	0.047716*	0.047643*	0.047882*	0.047212*	0.047153*	0.047276*
	0.028827	0.028822	0.028482	0.028333	0.028324	0.028040
Constant	0.005287	-0.003445	-0.011669	-0.012291	-0.021557	-0.022943
	0.015860	0.016052	0.010972	0.016810	0.016948	0.043319
Observations	7922	7922	7922	7922	7922	7922
State FE	Yes	Yes		Yes	Yes	
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes		Yes	Yes	
State X Time FE			Yes			Yes
R^2	0.081	0.082	0.153	0.084	0.085	0.155

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$