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April 2009

Online at https://mpra.ub.uni-muenchen.de/15229/
MPRA Paper No. 15229, posted 14 May 2009 23:32 UTC

Investment in Relationship-Specific Assets: Does Finance Matter?*

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First Draft: November, 2008
This Draft: April 8, 2009

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, relationship-specific investment, growth
JEL classification: G21, O16, O40

*The most recent version of this paper can be downloaded from http://works.bepress.com/strieborny/

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1 Introduction

This paper investigates a possible channel through which finance might affect the real economy and promote the long-run growth. Specifically, we examine whether financial development can alleviate problems associated with incomplete contracts and relationship-specific investments. If a producer requires non-standardized intermediate goods for the production, the supplier has to undertake ex ante investment in order to customize the input. The value of such specific input is thus higher inside the buyer-seller relationship than outside it, resulting in the well-known holdup problem. After the relationship-specific investment is made, the buyer can refuse to meet her commitment in order to trigger an ex post re-negotiation. The seller takes the risk of such opportunistic behaviour into account when making the investment decision. The consequence is underinvestment in the relationship-specific assets. In theory, the producer of the final good could agree to sign a detailed binding contract and thereby stimulate the supplier to undertake the optimal level of relationship-specific investment. In reality, even the most comprehensive contract remains incomplete as it cannot incorporate all possible states of world.[1] Consequently, written contracts combined with the legal enforcement of state offer only an imperfect remedy for the opportunism risk associated with relationship-specific investment. Furthermore, the transaction costs of production increase due to negotiating of sophisticated contracts, not to mention the costs of possible legal enforcement. This is where our paper brings the financial development into play. After all, the management of risk and decreasing of transaction costs belong to the main functions of finance (Levine 2005). Moreover, 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 anonymous stock markets) in the promotion of industries with high share of relationship-specific inputs.

First, even in countries with highly effective legal system, the way through courts is costly and does not offer an absolute guarantee of success. Financial intermediaries like banks often provide specialized products alongside the loans. Financial instruments such

[1] The seminal papers on incomplete contracts, relationship-specific investments and the associated holdup problem include Klein et al. (1978), Williamson (1979), Grossman and Hart (1986), and Hart and Moore (1990). Hart (1995) provides an intuitive introduction to this literature. Caballero and Hammour (1998) is an early work about macroeconomic consequences of relationship specificity and incomplete contracts.

as letter of credit offer a convenient alternative to the cumbersome route of complicated contracts and their legal enforcement. Furthermore, the remunerative character of such accompanying products gives the banks the incentive to acquire deep knowledge about specific industry in order to better fine-tune its services (Boot and Thakor 2000). In this context, one could also view the bank loans as contracts that explicitly or implicitly include relationship-specific investment and long-term commitment between the bank and client (Boot 2000, Ongena and Smith 1998). Accordingly, several authors (Boot et al. 1993, Rajan 1998, Rajan 2005) argued that the main comparative advantage of banks over the public markets or even the very reason for their existence lies in the ability to offer incomplete (or discrete) contracts. This makes the banks especially qualified to understand the needs and offer an appropriate service for the industries distinguished by the high share of incomplete contracts with their suppliers. Tellingly, the seminal work on the macroeconomic implications of relationship-specific assets mentions in the first paragraph the bank credits and investments of the upstream firms as two examples of economic specificity (Caballero and Hammour 1998, p. 725).

Second, there is always a residual risk of a "vis major" holdup due to unexpected economic problems of the buyer. Equipped with detailed written contracts and operating in country with superior legal enforcement, the suppliers will still face the risk of buyers unable to meet their financial commitments. A well-developed banking sector can play a vital role in reassuring the suppliers that hesitate to undertake irreversible specific investments. According to Fama (1985), taking a bank loan is a particularly suitable way to signal the creditworthiness to the business partners. Bank loans have often low priority among the contracts promising fixed payoffs. The renewal process of short-term bank loans thus implies a regular assessment of the borrower's ability to meet such contracts and signals the reliability of the borrower. The other agents with fixed payoffs (e.g. suppliers) consider those signals to be credible, as the bank backs them with its own resources. The value of such signals can be seen in the fact that many firms pay monitoring fees for lines of credit without effectively taking the offered resources (Fama 1985, p. 37).

Third, the credit lines can overcome the short-term bias in investment and lengthen the firms' planning horizon (von Thadden 1995). This can be decisive in order to induce relationship-specific investment. A firm undertaking such investment needs both to dispose of long-term planning horizon itself and to have business partners that shun

myopic behaviour.

To sum up, the existence of holdup problem increases the level of risk and transaction costs while the financial intermediaries like banks can alleviate some of the associated problems via the loans and other financial products. Consequently, a well-developed financial (especially banking) system should disproportionately boost industries dependent on the willingness of their business partners to undertake relationship-specific investments. To test this hypothesis we borrow the notion of contract-intensive (institutionally intensive) sectors from the recent trade literature on incomplete contracts and comparative advantage (Nunn 2007, Levchenko 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 in trade publications. The intuition behind this empirical proxy for the severity of holdup problem is simple. The non-existence of organized exchange or even reference price mean that the seller might have hard time to realize her product at the original price should the initial buyer refuse to pay.

In the main part of the paper we examine 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. To control for the potential endogeneity of the financial development, we rely on the GMM estimation and use the countries' legal origins as the instrumental variables. The effect of the banking sector on the economic performance of contract-intensive industries remains positive and significant. Next, we closer investigate the mechanism through which the banks promote the sectors with high share of relationship-specific inputs. We find that our channel works mostly via extensive margin (entry of new firms) and capital accumulation. There is somewhat weaker evidence that the banks boost employment in the contract-intensive industries. Those empirical results are consistent with the theoretical channels outlined above. It is especially new firms that need to signal their creditworthiness in order to stimulate relationship-specific investment of their business partners. Existing firms have already established a reputation with the suppliers and do not depend so much on the signals from third parties like banks. Similarly, the decrease of the short-term investment bias and increase of the planning horizon should manifest themselves first and foremost in the firms' capital accumulation.

As an additional test, we also look at the process of branch deregulation in the USA and examine its consequences for the contract-intensive industries. 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 constraining intrastate branching.[2] 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 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 arise, inter alia, from the promotion of contract-intensive industries.

This paper contributes to three strands of literature.

First, it provides evidence for a novel 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 might be 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. 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. Since the seminal work of Rajan and Zingales (1998) the search for such mechanism has focused on the industries that don't generate enough cash-flow and are therefore dependent on external finance. In other words, the finance-growth literature has placed special emphasis on the role of financial development in relaxing the credit constraints in the real economy. We look instead 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.

[2] 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).

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 is undoubtedly a plausible one. This paper shows that the domestic financial system plays an autonomous and equally important role in reducing the costs associated with incomplete contracts and holdup problem. 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 help to provide those, there will 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 might fail to protect the suppliers if the buyer cannot rely on a reliable source of financing. To put things simple, no level of institutional quality can protect the producers of specific inputs intended for the big US car companies. Only the financial stabilization of their troubled customers would do the trick.

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. The main argument contesting the positive effects of branch deregulation states that the resulting bank consolidation 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.[3] By looking at the contract-intensive industries our paper examines an alternative set of bank-dependent firms and provides some evidence for the benign view of branch deregulation.

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

2 Methodology and data

2.1 Empirical model

Our empirical model is based on the methodology introduced by Rajan and Zingales (1998) and then extensively used in the empirical literature examining the effects of financial development on economic growth. 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.

Specifically, we estimate the following equation:

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

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 (2007). 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 and 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 et 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 terms 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]

[4] We run also estimation with malaria risk from Sachs and Malaney (2002) as additional instrument.

Our database has complex structure with both country and industry dimensions 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 fourth moments. Obtaining reasonable estimate of fourth 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. Even though our sample has moderate size, we perform a heteroskedasticity test proposed by Pagan and Hall (1983). Anticipating our results, the Pagan-Hall test conducted for our main specification rejects null hypothesis of no heteroskedasticity at 1% level, therefore in our analysis we rely on GMM estimation [6]

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 was 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.[7] The growth effects of the

The results are qualitatively the same.

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

[6] We get very similar results using 2SLS estimation.

[7] 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).

deregulation on the contract-intensive industries are estimated using the following specification:

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

where G_{ist} is output growth for the industry i in state s at time t, D_{st} is a dummy for the branch deregulation for state s, CI_i is the contract intensity measure, X_{ist} is a set of controls that include initial industry share in total state (manufacturing) output and 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 effects 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 reported in current US dollars and transform them into constant international dollars using capital and GDP deflator from Penn World Table (Heston, Summers, and Aten, 2002). The resulting sample comprises of data for 28 manufacturing industries in 91 countries for the period between 1980 and 2004. The list of the countries used in our

sample is reported in Appendix 1.

We construct a cross-sectional panel by averaging variables over period 1980-2004. The initial industry share is constructed using the earliest available data for industry share, 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 analysis, we use two proxies for financial development: private credit to GDP and stock market capitalization to GDP, the standard proxies for financial development used in the empirical literature.

The data for quality of legal institution, the "rule of law", is taken from the database constructed by Kaufmann, 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.

In order to test our main hypothesis on differentiated impact of financial development across industries, we employ a contract intensity measure proposed by Nunn (2007), which quantifies the importance of relationship-specific investment for different industries.

More precisely, the contract intensity variable is the weighted sum of relationship-specific inputs used for production of final good, where relation-specificity characteristics are identified according to Rauch (1999) classification.[8] Given that the original measure of Nunn is reported for I-O 1997 industry classification, we use the measure of contract intensity from Levchenko (2008) who recomputes contract-intensity measure for 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 according to Rauch.

In addition to contract intensity measure, we use the 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. Rather than using the external finance dependence measure from Rajan and

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

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 proxies for contract intensity and external finance dependence are constructed using US industry or firm level data. The assumption is that these measures capture the technological characteristics of the industries which are similar across countries. 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 majority of 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 sample to the period from 1978 till 1992 in accordance with the empirical literature on the bank deregulation in the USA.[9] 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.[10]

[9] 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

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

3 International evidence

3.1 OLS estimation: banks versus stock markets

Table 1 reports the results of estimating equation (1) using OLS. The dependent variable is an average growth in output for each industry and country. In all specifications we include initial industry share and interaction term of contract intensity measure and initial level of financial development proxied by private credit to GDP, which is our variable of interest. Since in all regressions we include country and industry dummies, the overall effect of initial financial development is absorbed by country dummies.

The first column of Table 1 reports the results of estimation controlling only for our main variable of interest and initial industry share. This is our baseline specification. The subsequent columns present the results of regression with an augmented set of explanatory variables. Column 2 reports the results of estimation when controlling for the interaction term of variable rule of law and contract intensity measure. Country financial development might be correlated with country legal and contracting institutions. In such case our main variable of interests would also capture the effect of good contracting institution on the contract intensive industries. By including the interaction term of country rule of law and contract intensity into the set of regressors we explicitly account for the channel discussed by Nunn (2008): the contract intensive industries benefit disproportionately from good contracting institution. Column 3 shows the results of regression when adding the interaction term of measure of external finance dependence and country financial development to the set of control. Contract intensive industries might also be the industries that require external funds to support their operations. If so, then our main variable of interest would capture the effect of financial development on the industries that are external finance dependent. Column 3 of Table 1 presents result controlling for this alternative hypothesis.

In all above specifications our main variable of interest maintains positive and statistically significant coefficient. Inclusion of additional controls does not affect significantly our main variable of interests. On the other hand, the coefficient at interaction terms of contract intensity and rule of law, of financial development and measure of external finance dependence while positive, fail to have statistically significant effect. These results support our intuition that it is indeed contract intensive industries which benefit from good financial system.

The estimated relationship between financial development and contract intensity, in addition to being statistically significant is also economically meaningful. According to the estimate from the first column of Table 1, if Mexico's bank credit to GDP increases to the OECD' average, then the growth in manufacturing of "professional & scientific equipment" would increase by 5%. [11]

Next, we would like to investigate which type of financial development is important for contract intensive industries. On one hand, country level studies show that both bank and stock market development have positive effect on long run output growth. On the other hand, banks can provide specialized services alongside the normal lending which might be beneficial for contract intensive industries.

In order to answer this question we add another proxy of financial development into our main specification regression. Columns 4-6 report results of regression where we add interactions terms of stock market capitalization to GDP with industry characteristics into the set of explanatory variables. Our main variable of interest is robust to the inclusion of additional controls, i.e. the coefficient at interaction term of private credit to GDP remains positive and statistically significant at 1% level. The interaction term of the stock market capitalization to GDP with contract intensity measure while positive, fails to enter significantly into regression. This result confirms our intuition, that financial intermediaries provide firms with specific services like improved reputation or enhanced planning horizon which are important for the contract-intensive sectors and cannot be provided by anonymous stock markets.[12]

3.2 Instrumental variable Estimation

The results of the OLS regression cannot be taken as conclusive evidence of our main hypothesis due to number of reasons. First, due to reverse causality from economic growth to financial development. Focusing at industry level data might mitigate the problem but does not eliminate it totally. Second, our regression equation can have omitted variable which may seriously contaminate the estimation results.

[11] This is calculated as follows. Mexico's ratio of private credit to GDP is 0.16 and OECD average is 0.532. The coefficient at the interaction term is 0.169. If Mexico's financial development reaches the level of OECD average, then the growth rate in the "professional and scientific equipment" industry will increase by: $\beta * \triangle pcrdGDP * CI = 0.169. * (0.532 - 0.169) * 0.785 \approx 5\%$

[12] We also run estimations with other proxies for financial development such as stock market turnover or stock value traded. These results are available upon request.

La Porta et al. (1998, 1999) suggest that the origin of legal system of a country is a strong predictor of a country's financial development. We instrument the interaction variables of financial development (proxied by private credit to GDP) and industry characteristics (contract intensity measure of Nunn or external finance dependence measure of Rajan and Zingales) by the interaction terms of later variables with legal origin dummies.

Table 2 presents results of GMM estimation of the equation (1). The first three columns are identical to the first 3 columns from the Table 1. The coefficient at the interaction term of contract intensity measure and private credit to GDP remains positive and significant at least at 5% level in all three specifications. The coefficient at the interaction term of rule of law and contract intensity now becomes significant at 5% level, suggesting that contract-intensive industries benefits from both legal and financial developments. The interaction term of external finance dependence and financial development remains positive but insignificant after instrumentation.

While for the second and third specifications the coefficients at our variable of interest decrease in size and become less significant after instrumentation, for the first specification the magnitude of the coefficient increases in comparison with OLS estimates. We address this result later when discussing the Hansen and Sargan test.

In the lower part of Table 2, we report 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. [13] Both tests reject the 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

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

of three specifications.[14] 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. The inflation of the coefficient at our main variable after instrumentation, reported in column 1 of Table 2, is an additional indication of the problem we might have with our set of instruments.

La Porta et 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. In particular, we add the interaction terms of industry dummies with log real income per worker into regression equation. In this way we 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 and contract intensity remain significant and positive. Also, the magnitude of the estimated coefficient stays approximately at the same level as in the estimations without additional controls. The Hansen/ Sargan statistics clearly improves: now we cannot reject null hypothesis at 10 % level of significance in two out of three specifications. The coefficients at the interaction term of rule of law and contract intensity variable as well as at the interaction term of external finance dependence and financial development stay positive but insignificant. This result 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 other two interaction variables into regression. 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.

[14] 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.

3.3 Financial Development and the Channels to Economic Growth

The industry can grow either because new establishments are being created or because existing establishments increase in size or both. In order to investigate which component of the overall growth benefits from financial development, we run separate regression for each of its components.

Table 3 and 4 report the results where dependent variable is the average growth per establishment and the average growth in number of establishments respectively. The first three columns present the OLS regressions, the next three present baseline GMM estimation and the last three columns of the tables report the results of GMM estimation including into specifications the interaction terms of industry dummies and GDP per worker to control for potential omitted variable bias. In all specifications, financial development has positive and statistically significant effect on the growth in number of establishment while it fails to have statistically significant effect on the growth in output per establishment.

These results suggest that financial development facilitates creation of new firms in the contract-intensive industries. This is in line with our main intuition: 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.

Next, we would like analyze the effect of the financial development under standard growth accounting framework. In order to do so, we reconstruct capital stock using standard methodology employed by Hall and Jones (1999) and TFP using methodology of Solow (1957). See Appendix D for details.

In the Tables 5 to 7 we present the results of estimation where dependent variable is growth in capital, growth in employment and TFP growth. Again, the first three columns report the OLS estimations, the following three present the results of baseline GMM estimation and the last three columns report the results of GMM estimation with augmented set of regressors.

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). This result suggests that financial development promotes the long run growth in contract intensive industries by boosting the long run rate of accumulation of physical capital.

Turning to employment growth, results are ambiguous (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 external finance dependence measure and financial development. In sum, we do not find robust relationship between financial development and employment growth in contract intensive industries.

Finally, Table 7 presents the estimation results with TFP growth as dependent variable. The coefficient at our main variable of interest is not significant in both OLS and GMM estimations. The data do not suggest that higher level of financial development promotes economic growth via improvements in TFP.

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 markets 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. All these changes translated into overall higher growth of the real sectors of economies (see e.g. Jayaratne and Strahan 1996, Kroszner and Strahan 1999, Strahan and Black 2002, Strahan 2003).

As the branch deregulation led not only to more efficient but also to more consolidated banking sector, its impact on the contract-intensive industries is theoretically

ambiguous. The increased quality of surviving banks should benefit industries that heavily depend on the quality of bank services.[15] The effect of bank consolidation is not that clear-cut. 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. Here the banks cannot offer low prices early on as they lack the market power to recover those investments 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 relationships with borrowers. In the same spirit, if the monopolistic banking structures simply result 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, outweigh the possible comparative advantage that small banks may have in forging long term relationships with small businesses. Ceterelli and Gambera (2001) show that industries dependent on external finance 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

[15] 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.

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 manufacturing 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 controls 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 column we report the results of the regression controlling for state×time and industry fixed effects. The inclusion of the interacted state×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×time fixed effects.

5 Conclusion

Several prominent papers (Klein et al. 1978, Williamson 1979, Grossman and Hart 1986, Hart and Moore 1990) argue that a rational agent (e.g. upstream supplier) tends to underinvest in relationship-specific assets due to possible opportunistic behaviour of her contractual partner (downstream purchaser). The standard proposals to alleviate the adverse economic consequences of this holdup problem include vertical integration or legally binding contract between the two parties. The recent trade literature (Nunn 2007, Levchenko 2007) builds upon this insight and demonstrates the beneficial effects of contract-enforcing institutions for the sectors with high share of relationship-specific

inputs. The empirical results in this paper suggest that financial development might be at least equally important for the economic performance of such contract-intensive industries.[16] 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. First, bank products suitable for reassuring the party undertaking the relationship-specific investment often require a functioning legal system. Letter of credit would be a primary example. One might thus view institutional quality and strong banking sector as complements, rather than substitutes. Second, an influential strand of literature (e.g. Levine et al. 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 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.

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Appendix A

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,[17] this will allow us to avoid unduly reduction in our sample to the countries that have available data for value added and wage payment.

Countries list

Argentina; Armenia; Australia; Austria; Bangladesh; Benin; Bolivia; Botswana; Brazil; Bulgaria; Cameroon; Canada; Chile; Colombia; Costa Rica; Cote d'Ivoire; Cyprus; Czech Republic; Denmark; Ecuador; Egypt; El Salvador; Ethiopia; Finland; France; Gabon; Ghana; Greece; Guatemala; Honduras; Hong Kong; Hungary; Iceland; India; Indonesia; Iran; Ireland; Israel; Italy; Japan; Jordan; Kenya; Korea(republic of); Kuwait; Kyrgyzstan; Latvia; Lithuania; Macao; Malawi; Malaysia; Malta; Mauritius; Mexico; Moldova; Mongolia; Morocco; Mozambique; Nepal; Netherlands; New Zealand; Nigeria; Norway; Oman; Pakistan; Panama; Peru; Philippines; Poland; Portugal; Qatar; Romania; Russia; Senegal; Singapore; Slovak Republic; Slovenia; South Africa; Spain; Sri Lanka; Sweden; Switzerland; Tanzania; Thailand; Trinidad &Tobago; Tunisia; Turkey; United Kingdom; United States; Uruguay; Venezuela; Yemen

[17] 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.

Appendix B: 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, (2005)
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 data, intrenational sample	UNIDO database
Gross domestic product by states, sample of US states	Bureau of Economic Analysis
Branch deregulations dates	Strahan, Philip (2003)
Input- Output table 1972	Bureau of Economic Analysis

Appendix C: Summary statistics, international sample

Variable		Obs	Mean	Std. Dev.	Min	Max
contract_intensity	Contract intensity	2341	0.493959	0.199193	0.058	0.859
RZ_fin_dep	Dependence on external finance	2341	0.270577	0.351703	-0.45	1.14
growth	Growth of output	2341	0.012296	0.134721	-1.68474	1.592252
growth_TFP	Growth of TFP	1841	-0.0072	0.13059	-1.81938	1.526246
growth_capital	Growth of capital	1455	0.035673	0.131008	-0.63703	2.931202
growth_employees	Growth of employment	2325	0.002165	0.096035	-0.97985	1.609438
growth_establishment	Growth of number of establishment	2212	0.036042	0.102419	-0.65645	0.873138
growth_output_etsablishment	Growth output per establishment	2196	-0.02775	0.158816	-1.17367	1.042946
initial_industry_share	Initial Industry Share	2341	0.040625	0.065368	8.43E-06	1
initial_ln_rgdpwok	Initial Log Rea GDP per Worker	2341	9.539266	0.991762	7.001464	11.6478
initial_pcrdbgdp	Initial Private Credit of the Banks to GDP	2341	0.308972	0.245056	0.013926	1.429799
initial_stmktcap	Initial Stock Market Capitalisation to GDP	2164	0.192104	0.285135	0.000504	1.417954
legor_fr	Dummy for French legal origin	2341	0.474584	0.49946	0	1
legor_ge	Dummy for German legal origin	2341	0.038018	0.19128	0	1

Appendix C: Summary statistics, international sample (continue)

Variable		Obs	Mean	Std. Dev.	Min	Max
legor_sc	Dummy for Scandinavian legal origin	2341	0.057241	0.232351	0	1
legor_so	Dummy for Socialistic legal origin	2341	0.155916	0.362854	0	1
legor_uk	Dummy for Common Law	2341	0.274242	0.446227	0	1
malfal	% of population at risk of malaria	2292	0.186172	0.340683	0	1
pcrdbgdp_fin_dep	Private Credit of the Bank to GDP multiplied by Dependence on external finance	2341	0.08456	0.155903	-0.64341	1.629971
pcrdbgdp_intensity	Private Credit of the Bank to GDP multiplied by Contract Intensity	2341	0.153016	0.145351	0.000808	1.228197
stmktcap_fin_dep	Stock Market Capitalisation to GDP multiplied by Dependence on external finance	2164	0.052581	0.144908	-0.63808	1.616467
stmktcap_intensity	Stock Market Capitalisation to GDP multiplied by Contract Intensity	2164	0.094799	0.156793	2.92E-05	1.218022
Law_intensity_96	Rule of Law interacted with Contract Intensity	2130	0.294926	0.159616	0.013948	0.814145

Appendix C: Summary statistics, US sample

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
growth	Growth of output	19584	0.0199444	0.1991991	-2.114777	3.07245
initial_total_gsp	Gross state product in 1972	21560	99860.44	114022.5	8263.771	576793.7
initial_industry_share	Initial industry share	20560	0.0106398	0.014165	0	0.1675902
deregulationdummy	Deregulation dummy	21560	0.6428571	0.4791685	0	1
contract_intensity_deregulation	Contract intenisty measure multiplied by Deregulation dummy	21560	0.351336	0.3066127	0	0.859
RZ_fin_deregulation	Extrenal finance dependence measure multiplied by Deregulation dummy	14700	0.231	0.3502002	-0.45	0.96
contract_intensity	Contract intenisty measure	21560	0.5465227	0.1988994	0.201	0.859
RZ_fin_dep	Extrenal finance dependence measure	14700	0.3593333	0.3803368	-0.45	0.96
total_gsp	Gross State Product	21560	129552.7	155335.5	8263.771	1065591
gsp	Gross Industry Output	20740	1312.225	2558.308	0	45402.2
growth_total_gsp	Growth of Gross State Product	20482	0.0279165	0.0328054	-0.2002096	0.155611

Appendix D: 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 D: 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