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**THE EFFECTIVENESS OF THE LAW, FINANCIAL DEVELOPMENT, AND
ECONOMIC GROWTH IN AN ECONOMY OF FINANCIAL DEPRESSION:
EVIDENCE FROM CHINA**

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ABSTRACT. Enhancing the legal system may hinder the development of some aspects of the financial sector in an economy characterized by financial repression. Using Chinese provincial data in the 1990s, we find that an enhanced legal system suppresses private investment, increases the private share of bank credit and bank competition, and has no effect on financial depth. We interpret those findings as evidence showing the existence of the leakage effect that moves financial resources from the privileged state sector to the rationed private sector. In addition, we find that an enhanced legal system does not have a significant effect on the average growth rate. We conclude that the smooth functioning of the legal system requires other institutions to complement it.

Keywords: legal system, financial development, financial repression, economic growth
JEL classification: G20, K42, O17

Financial development is a key factor to promote economic growth (Levine, 1997). Recent research identifies the written law as a prominent determinant of financial development and economic growth in general (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998; Levine, 1998). However, this view has been challenged by Berkowitz Pistor, and Richard (2003) and Pistor, Raiser, and Gelfer (2000) who have found that the effectiveness of the law is more important than the written law in promoting financial development, especially in transition countries. While the two studies focus on the gross effect of the law on financial development, this paper aims at moving the study one step forward to decompose the channels by which the effectiveness of the law influences financial development when financial repression is a significant characteristic of the economy. Financial repression widely exists in developing and transition countries (McKinnon, 1973, 1993; Shaw, 1973). One consequence of financial repression is the creation of the wedge between the true cost and the nominal cost of financial resources. This wedge provides incentives for private agents to engage in often illegal but nonetheless socially productive activities. As a result, enhancing the legal system may not help financial development.

The Chinese provinces provide a good case for the study of the relationship between the effectiveness of the law and financial development. While they are subjected to the same written law, both the effectiveness of the law and financial development in these provinces show remarkable variations. The Chinese financial system has a clear flavor of repression. The interest rate is set by the central bank to be much lower than the market rate and the banking sector is overwhelmingly dominated by four large state-owned banks. A consequence is serious credit rationing that favors the state sector and suppresses the private sector. However, the private sector has been China's growth engine in the last decade, so there is a clear mismatch between the allocation of financial resources and the forces of economic growth.

Among a few studies on law and economic development in China, Allen, Qian and Qian (2002) study the Chinese legal system by using the La Porta et al. (1998) legal indices and find that the Chinese system is incomplete compared with La Porta et al.'s sample countries; nevertheless, they find that China's economic growth has been largely sustained by the informal sector where the formal legal system only plays a marginal role. Pei (2001) also finds a gap between China's remarkable growth record and its weak enforcement of commercial contracts. Alford (2000) points out the insufficiency to just look at China's formal laws when one evaluates the Chinese legal system; instead, he directs researchers to attend to the interplay of the formal law and informal enforcement mechanisms.

This paper extends the above studies by providing an economic rationale for the weak legal system in China's distorted financial system. A key argument of this paper is that there exists a leakage process that moves financial resources from the state sector to the private sector. This movement circumvents the rationing imposed on the private sector and is socially efficient. Because the leakage often takes illegal channels, enhancing the law will block efficient resource reallocation and become detrimental to economic growth. Nevertheless, a more effective legal system is likely to promote financial development whenever credit rationing does not constitute an

obstacle. In this paper, we study the effects of enhanced law on four key indicators of financial development, share of private investment, share of private bank credit, financial depth, and bank competition. These indicators are frequently studied in the literature (Levine, 1997).

We construct a unique objective measure of the effectiveness of the law, i.e., the ratio of closed cases in all court cases in a year. Using this measure, we find that a more effective legal system has a significantly negative effect on the share of private investment, but has a significant positive effect on the share of private bank credit and bank competition, and does not have a significant effect on financial depth. Further exploration finds that the negative effect on private investment is translated into a reduction of 0.7 percentage points in the growth rate, which is equivalent to a loss of 8 billion US dollars in a year. Overall, enhanced rule of law does not have a significant contribution to the average growth rates of the Chinese provinces throughout the 1990s.

Our work is closely related to an emerging literature on the value of law in transition countries. Recent works have shown that law has a minimal to moderate role in explaining economic performance in the transition countries, especially the former Soviet Union states and China. In particular, China is presented as a paradox of a low degree of the rule of law but a high speed of economic growth (Murrell, ed., 2001). Our work partly resolves this paradox by presenting a case study of the relationship between the rule of law and financial development. While our results can be interpreted as a case to support the claim that one distortion needs another distortion to correct, we believe that a better interpretation is that the legal system is but one element of the institutional nexus and its smooth functioning needs other elements of the nexus to complement. This line of argument is analogous to Berkowitz et al. (2003)'s argument of the transplant effect, which emphasizes the readiness of the recipient country in making the transplanted law work.

The rest of the paper is organized as follows. Section 1 introduces the Chinese background and discusses the mechanism of the leakage effect under financial repression. Section 2 proposes several testable hypotheses regarding the effects of the effectiveness of the law on the four indicators of financial development and economic growth. Section 3 introduces the data and discusses the variables. Section 4 provides empirical results of the tests of the relationship between enhanced legal system and financial development. Section 5 moves one step forward to explore the impact of enhanced legal system on economic growth. Section 6 concludes the paper.

1. Financial repression and the leakage effect

Financial repression in China

Financial repression is a nascent characteristic of the Chinese banking system. In the planning period of 1952-1978, low interest rates were adopted to provide low-cost finance for China's heavy industry-oriented industrialization (Lin, Cai, and Li, 1996). Financial repression has continued after the open-door policy was adopted in the late 1970s. The official interest rates have been consistently lower than the rates found in

the informal credit market by 50-100% (Garnaut, Song, Yao, and Wang, 2000). In recent years, a band of 10 percent below and 50 percent above the official benchmark rate has been allowed for banks when they lend to small and medium-sized firms. But the market rate is still 50% above the higher bound. Aggravating the situation, the Chinese banking system is overwhelmingly dominated by the four large state-owned banks.¹ Until the early 1990s, credit issued by these four state-owned banks had consisted of more than 90% of the total amount of formal bank credit in the country. This ratio was kept at 77% even by 2000 (PBOC, 2001). These banks suffer from the serious problems of huge non-performing loans and inefficient operation. The official number of non-performing loans is 25% of the outstanding loans (Zhao and Guo, 1998, pp. 186-187). The whole banking system is virtually in a bankrupt position as its net worth has become negative (Lardy, 1998, pp. 109-111). Financial repression and the dominance of inefficient state banks have led to serious credit rationing in the banking sector. The non-state sector has suffered the most.² Although its share in China's total GDP has surpassed 70%, this sector has received less than 20% of the formal bank credit in most of the last decade, and the other 80% has all gone to the state sector (Garnaut, et al., 2000).

There are several causes for the non-state sector to become the target of rationing. The first is political. While a default by an SOE is tolerable in the Chinese banking system, a default by a private firm will surely raise the concern as to whether the loan officer has received under-the-table benefits from the firm. It is therefore rational for a loan officer to be highly cautious when he decides on a loan to a private firm. The second cause is more practical. Most of the firms in the non-state sector are small and medium-sized firms that intrinsically have a higher risk of default than the SOEs, which are usually large and have a lower risk of failure. Therefore, discrimination on the non-state firms is essentially a discrimination based on firm size. When information asymmetry exists, this is a rational choice on the part of the banks. Lastly, credit rationing has been aggravated by the Chinese regulatory authority's imposition of a restrictive lending policy and discipline on the commercial banks. The most stringent policy, perhaps, is the "life-time responsibility" introduced in 1998, which may lead to the dismissal of a loan officer if a single loan passed through him is ever defaulted. Under this policy, it is natural to find that banks refrain from lending to any firms. This has been exactly what has been happening since 1998.³

Both theories and empirical evidence have shown that financial repression hurts economic growth (McKinnon, 1973; Levine, 1997). Then why has China been

¹ They are China Bank of Industry and Commerce, Bank of China, China Construction Bank, and China Agriculture Bank. In addition to these four large banks, China has a half a dozen of small and regional banks that involve private shares.

² The non-state sector in China includes private firms, collective firms, and agriculture. Agriculture has been effectively privatized by the rural reform, and the collective firms have disappeared in recent years as a result of massive privatization (Garnaut, Song, Tenev, and Yao, 2003). Therefore, the non-state sector has become equivalent to the private sector. The two names will be used interchangeably in this paper, but the reader should realize that their scopes were different in earlier years.

³ In the 1990s before 1998, the average annual growth rate of commercial credit was 22.9%, but the rate was slowed down to only 10.7% in the period of 1998 to 2001 (PBOC, 2001). This slowdown was definitely linked to the shock caused by the Asian Financial Crisis, but many analysts also believe that it was tied to the tightened bank regulations.

different? Despite the debate surrounding China's GDP statistics of the recent years,⁴ it is undeniable that China has trimmed most other countries in the world in terms of the rate of economic growth. One certainly can argue that China could have achieved higher growth rates if financial repression had been removed. However, it is hardly possible for a country with China's size to maintain double-digit growth rates for twenty years. There must exist some ways that have compensated the loss caused by financial repression. While explanations have been proposed outside the realm of financial development,⁵ Li (2001) provides an interesting insight regarding financial repression itself. Li believes that China's financial repression has been mild and helped China's economic growth by maintaining financial stability and gaining political supports for reform.⁶ While Li's insight can be disputed, here we turn to proposing and testing another explanation that deals with the spontaneous actions taken by private agents to remedy financial repression. This explanation is centered at the leakage effect that moves financial resources from the state sector to the private sector. It is closely linked to the functioning of the law in China.

Channels of the leakage

While it has a system of relatively complete and reasonable written laws, China is notorious for its weak implementation of the law (Garnaut et al., 2000; Pei, 2001; Stone and Yao, 2002). Alford (2000) rightly points out the insufficiency to just study China's formal laws when one evaluates the Chinese legal system. Pistor et al. (2000) show in a sample of 19 transition countries that the effectiveness of the law is more significant than the completeness of the written law to enhance economic growth. While this result may generally hold at the aggregate level, more careful studies are needed to analyze the channels by which the effectiveness of the law could potentially improve economic efficiency. In terms of the purpose of this paper, a more effective legal system may block the leakage process that supports the movement of financial resources from the state sector to the private sector. To the extent that the private sector is more efficient than the state sector (Wang and Yao, 2002; Song and Yao, 2003), the leakage helps improve economic efficiency in China. There are two channels for the leakage, both coming into existence in response to China's repressed financial system.

The first channel is commercial credit in the form of delayed payment in the firm's payable account. This practice gives rise to China's "triangle debts" problem that has troubled the central government since the early 1990s. By 2001, triangle debts reached 181 billion US dollars (People's Daily, 2002). However, Evidence suggests that triangle debts are a means for firms to get finance for their working capital. For example, Gao (2000) shows that the amount of triangle debts increased when the economy was overheated, especially in the mid-1990s, and decreased when the economy slowed down. Gao believes that the need for credit was the major cause

⁴ See a symposium on this issue in *China Economic Quarterly* (Chinese), Vol. 2, No. 1, October 2002.

⁵ For instance, Lin et al. (1996) propose that China's alignment with its comparative advantage is the major cause for its high-speed growth in the last twenty years; Qian and his collaborators (Qian and Weingast, 1996; Qian and Roland, 1999) believe that China's unique fiscal federalism is the key to its success.

⁶ However, Li also believes that a "trap of financial repression" has been formed in China because the vested interests do not want to lose their privileges granted by the old system.

for the observed pattern. Although there are no systematic statistics, it is reasonable to believe that the private sector owes the state sector in net in triangle debts. The state sector is the privileged sector in terms of the access to formal bank credit and it faces a soft-budget constraint, so it is more likely to be on the side of net supply in the web of triangle debts. Payment deferment bleaches the contract and would not be tolerated in developed economies. The persistence of the triangle debts in China, however, is most likely a result of a second-best equilibrium reached by individual firms' rational calculation. Fieldwork by the authors has found that firms consistently added a higher markup for their goods to insure against the risk of deferred payment when they negotiated a contract with the buyer. The cost of this "low" equilibrium is high, but it is the best that the economy can achieve under credit rationing.

The second channel of leakage is the diversion of assets and investment from the state sector to the private sector. An SOE may divert its assets and investment into the private sector by several measures; some of them are legal, but many are illegal. An SOE can legally set up a joint venture with a domestic private firm or an international firm to release its assets into the private sector. However, there are also illegal ways to divert assets and investment. One is to divert bank loans designated for certain projects to other purposes that are realized in the private sector. For instance, there has been a consistent trend of rerouting of bank credit from the inland provinces to the coastal provinces. Since the inland provinces are dominated by SOEs and the coastal provinces are more privatized (Garnaut et al., 2003), this rerouting effectively results in a diversion of funds from the state sector to the private sector. The leakage from the state sector also happens through the stock markets that are dominated by SOEs. It is an open secret that the listed companies divert the funds raised in the stock markets for other purposes. Although no systematic statistics exist, it is fair to believe that part of the diverted funds has gone to the private sector because it is the sector that has a higher return. A third way of leakage is managerial "tunneling", a word coined by studies on post-privatization Russia and other former Soviet Union countries and meant to describe managers' diversion of firm assets for personal gains. This practice is obviously illegal, but also widely observed in China, although the tunneling is not necessarily done by the manager alone. This is no more evident in the process of *gaizhi*, a Chinese expression for firm restructuring whose scope ranges from incorporation to sale through auction of SOEs. A widely observed means of restructuring is spinning off by which the old SOE spins off a new private firm. Most of the productive assets of the old SOE would be transferred to the new firm, leaving the old SOE with only debts, useless equipment, and old workers (Garnaut et al., 2003).

Many of the activities through two channels are illegal by Chinese laws. Yet they have helped the private sector to gain scarce financial resources and may be good for economic growth. In the next section, we will deduce several testable hypotheses that explore the relationship between the law, financial development, and economic growth.

2. Testable hypotheses

Financial development

To carry out the discussion in this section, we need a structured framework. Our premise is that the financial system is characterized by repression and rationing toward the private sector. Figure 1 then shows the structure. We set the scene in the banking sector, ignoring the stock market for simplicity (our empirical tests will also focus on the banking sector). The state sector is assumed to get finance only through bank credit, and the private sector is assumed to get finance both through bank credit and other sources such as self finance and borrowing from friends and the informal credit market. Bank credit allocated to the private sector is rationed, though.

We are concerned with four indicators of financial development, financial depth (DEPTH, thereafter), bank competition (COMP), share of private credit (PRIVATE), and share of private investment (PRIINV). DEPTH is adapted from King and Levine (1993). While King and Levine define this measure as the liquid liabilities of the financial system divided by GDP, here we define it as the size of the outstanding loans of the banking system divided by GDP. Our definition is narrower than King and Levine's because we do not consider non-banking financial intermediaries and in the banking sector we do not include banks' capital and interest-bearing assets such as treasury bonds and savings in the central bank. We adopt this narrower definition because of the limitation of the available data. Nevertheless, it is reasonable to believe that our definition of the financial depth is highly correlated with King and Levine's definition. COMP is a new measure, which is the share of credit issued by banks other than the four major state banks. King and Levine (1993) define a measure, BANK, to measure the degree to which the central bank versus commercial banks is allocating credit. Since our study unit is province, this measure is not adequate. Instead, we use COMP to measure the competitiveness of the banking system. There is evidence showing that the smaller and regional banks are more flexible and provide more services and their development is uneven across the country.⁷ PRIVATE is defined the same as King and Levine's, equaling the share of credit allocated to private enterprises in total domestic credit. PRIINV is a new measure. It is introduced specifically to accommodate the leakage effect, which the measure PRIVATE does not capture.

⁷ Yao (2003) finds that the regional banks in Zhejiang, a province on the east coast, have introduced a number of financial innovations (such as buyer's credit and using unpaid export tax rebates as collateral), while banks in Sichuan, an inland province, have stuck with the old practice.

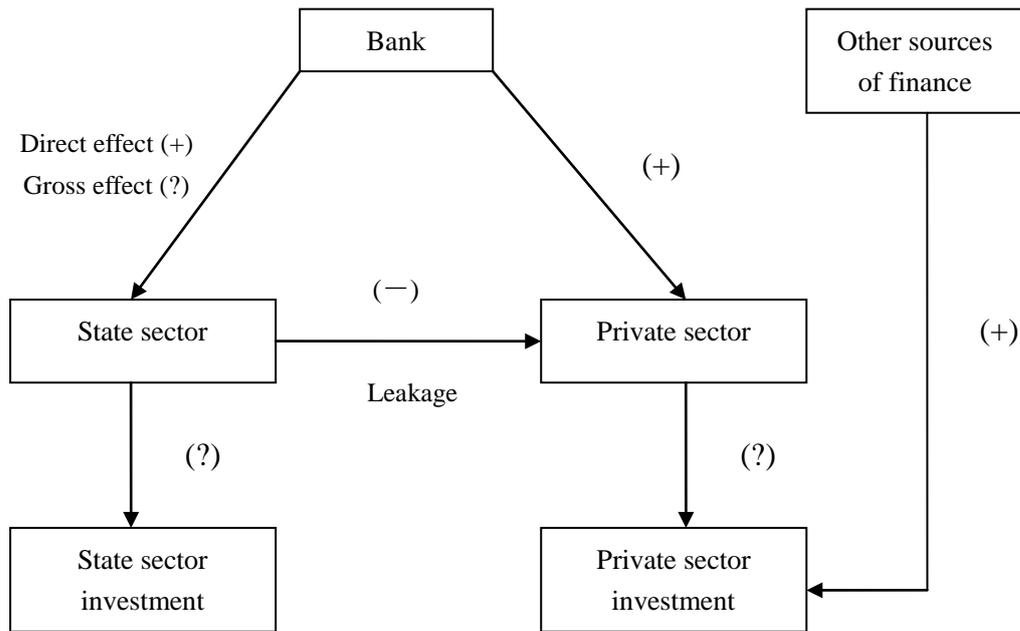


Figure 1. The effectiveness of the law and financial development
(Symbols in parentheses indicate the effects of enhanced law)

With the above setup, we can proceed to derive several testable hypotheses regarding the relationship between the effectiveness of the law and the four measures of financial development. We say that the effectiveness of the law is improved if the court ruling over disputes of commercial contracts becomes more accurate, expedited, and effectively enforced. Our key argument rests on the leakage effect running from the state sector to the private sector. Test of this effect would be easy if we had data on the magnitude of the leakage. Unfortunately, we do not have such data. Consequently, we have to resort to indirect method to conduct the test. This is done by studying PRIINV, the share of private investment. We notice that three factors determine the magnitude of PRIINV: the private sector's share of credit directly allocated by the banking system (PRIVATE), the leakage, and finance through other sources such as internal profit, the informal financial market, and personal borrowing. With the other two factors controlled for, we expect that leakage effect would lead to a negative impact of the enhanced legal system on PRIINV. This is our first testable hypothesis:

H1. The enhanced effectiveness of the law *reduces* the share of private investment if the share of private credit and the other sources of finance are controlled for.

If this hypothesis is proved, enhanced law may or may not increase the share of private investment, which leads to our second hypothesis:

H2. The share of private investment may or may not increase as the effectiveness of the law is enhanced.

With the above two hypotheses established, we can move up one level to study the expansion of credit. An improvement in the effectiveness of the law gives the bank more confidence to lend to both the state sector and the private sector. Because part of the reason for the rationing on the private sector is information asymmetry, stricter enforcement of the contract helps alleviate the problem by providing *ex post* remedies should a default ever happen. Therefore, we expect that the credit to the private sector will increase when the effectiveness of the law is improved. The same thing may happen to the state sector, but the improvement is not likely to be as strong as in the case of the private sector because the state sector is not rationed. Therefore, although the direct effect of enhanced rule of law is positive for both sectors, we nevertheless expect that the share of the credit to the private sector will increase as the legal system becomes more effective. This trend is enhanced when we take into consideration the leakage effect, which is shown by H1 to be negatively affected by the enhancement of the rule of law. Consequently, the state sector's demand for credit becomes smaller. The gross effect of enhanced rule of law on the state sector thus is unclear. As a result, the total amount of credit issued by the banking system may or may not increase as the legal system becomes more effective. The outcome depends on the magnitude of the leakage effect and the relative size of the state sector versus the private sector.

The discussion in the above paragraph leads us to our first two testable hypotheses:

H3. The share of credit to the private sector will increase as the legal system becomes more effective.

H4. The impact of the improved legal system on financial depth is not determined.

Lastly, as the smaller and regional banks target more on private firms than the four major state banks, enhanced rule of law will increase their incentive to issue more credit to the private sector for the same reasons that have established H3. We then expect the following hypothesis:

H5. A more effective legal system leads to more competition in the banking system.

Economic growth

An enhanced legal system may help economic growth either through enhancing financial development or through other non-finance channels. Judging by the hypotheses established above, we do not have *a priori* assessment on its effect through the financial channel. It is equally uncertain as to whether an enhanced legal system has a positive effect through non-finance channels because they may be subjected to similar arguments that we took to establish our earlier hypotheses. We leave open the conclusion in the following hypothesis:

H6. The impact of a more effective legal system on economic growth is not

determined.

3. Data and variables

We assemble the data for our tests for 28 Chinese continental provincial administrative units in the period of 1991-2001.⁸ Most of our data come from official Chinese publications, especially *China Statistical Yearbook*. The four indicators for financial development, DEPTH, PRIVATE, COMP, and PRIINV were defined earlier. DEPTH as a measure for financial depth is subjected to a qualification, though. It is well known that there is a considerable amount of non-performing loans in the Chinese banking system, so the strength of DEPTH as a measure of financial depth is weakened. However, there are no published data on the amount of non-performing loans in each province and there is no way to find them by personal efforts. We therefore have to rely on this imperfect measure of financial depth. Nevertheless, we believe that the true financial depth in each province is closely correlated with our measure, as the amount of non-performing loans is likely to be proportional to the total amount of outstanding loans.

The unique feature of our dataset is that we have obtained a measure for the effectiveness of the legal system. While other studies rely on surveyed subjective opinions to construct the measure (e.g., Pistor et al., 2000), we construct an objective measure by collecting court data. This is the number of cases closed in each year as a ratio of the total number of cases taken by the court in the same year.⁹ We will denote it by CASES. In China, the time span for a case to close depends both on the speed of the court ruling and the effectiveness of the implementation of the ruling. While courting ruling takes time in certain circumstances, it is the implementation stage that takes most of the time and is complained the most by entrepreneurs. In some cases, it takes years for the ruling to get implemented and the case closed (Stone and Yao, 2002). The qualification of the judges, the sufficiency of funds allocated to the court, the degree of corruption in the legal system, as well as the consciousness of the business sector in recognizing the rule of law all influence the time span to settle a case. Therefore, CASES provides a comprehensive measure of the effectiveness of the legal system in each province.¹⁰ In the regression, we use the logarithm of CASES to facilitate our interpretation of the scale of its effects.

In our regressions, we will also include a set of control variables that describe a province's general economic conditions and social development. They are the ratio of government spending in total GDP (GOV), the share of the state sector's industrial output in total industrial output (STATE), foreign direct investment divided by GDP (FDI), international trade (the sum of imports and exports) divided by GDP (TRADE), primary school enrollment (ENROLL), and the number of associations (business

⁸ Tibet is excluded and Chongqing, a new provincial-level municipality separated from Sichuan province in 1997, is added back to Sichuan province.

⁹ Since some closed cases in a year are unclosed cases left from the previous years, it is possible that this ratio is above 1.

¹⁰ We realize that this measure also faces some challenges. The most serious is that the court may be selective when it takes cases, that is, they may only take cases that are easier to settle. But the measure is the best that we can get.

chambers, industrial associations, and other voluntary or government-sponsored associations) in 1,000 of the population (ASSOCs). It has been established in the literature that government expenditure slows down while FDI, trade, and better education promote economic growth (e.g., Barro and Sala-i-Martin, 1995; Dollar, 1992). So it is reasonable to believe that these variables also play a role in financial development. In particular, government expenditure may have a crowding-out effect on financial development. It has also been shown that social capital promotes economic growth (Knack and Keefer, 1997). The variable ASSOCs is meant to capture the amount of social capital in a province. Social capital fosters trust in the society, which is very important in current China where trust has not been established as a business culture. More trust reduces transaction costs so we expect that a province with a higher value of ASSOCs would have a higher degree of financial development. The variable STATE is meant to capture a province's economic structure. While we expect that a larger state sector will reduce bank competition and the amount credit allocated to the private sector and has a crowding-out effect on private investment, it is not clear whether it is detrimental to our measure of the financial depth. This is because it is relatively easier for SOEs to borrow from the bank, so a larger state sector may induce the bank system to issue more credit.

Table 1 reports the basic statistics of the variables. The average of CASES is 0.95, which is high. Nevertheless, this high ratio should not be interpreted as an indicator showing that the legal system is close to perfect. Rather, CASES should be taken as a scaled-up index for the general effectiveness of the legal system. Mathematically, this seemingly compressed measure can represent a rather dispersed distribution of the effectiveness of the legal system.¹¹

To control for endogeneity and irregularities caused by intertemporal fluctuations, all the explanatory variables (CASES and the control variables) will enter our regressions by their three-year lagged averages (the four dependent variables of financial development will use the value of the current year, though). To save data, the year of 1992 uses the explanatory variables of 1991, and the year of 1993 uses the averages of the explanatory variables of 1991 and 1992.

4. The effectiveness of the law and financial development

Tests of H1 and H2

To test H1, the most important thing is to find controls for the other sources of finance. Better rule of law is likely to enhance these sources of finance as the formal legal practice provides a yardstick standard for contract enforcement in the informal market and personal relationships (Hay and Shleifer, 1998). So the estimate for the impact of the rule of law on the leakage effect would be biased if we did not control for those sources. Unfortunately, we do not have data to directly measure them and have to rely on indirect controls. Some of the control variables introduced in the last

¹¹ For example, an index for the general effectiveness of the legal system can be defined as $(CASES/10)^2$, which is positively correlated with CASES but has a larger variance than CASES.

section serve that purpose. For example, FDI can be an important source of finance for the private sector. In addition, firms in a province with a larger stock of social capital may find it easier to get finance in the informal financial market. The most effective control, however, perhaps is per-capita GDP because higher per-capita GDP implies more surpluses in people's earnings. Therefore, we estimate the following two-way factor model to test H1:

$$(1) PRIINV_{it} = a_0 + b_1 \overline{CASES}_{it-1} + b_2 \overline{X}_{it-1} + c_1 PRIVATE_{it-1} + c_2 \ln GDP_{it-1} + a_i + a_t + e_{it}.$$

In the equation, $PRIINV_{it}$ is the share of private investment of the i th province in year t , \overline{CASES}_{it-1} is the lagged three-year average of CASES, \overline{X}_{it-1} is the lagged three-year average of the set of control variables defined in the last section, $PRIVATE_{it-1}$ is PRIVATE lagged for one year, $\ln GDP_{it-1}$ is per-capita GDP lagged for one year, a_0 is the constant term, b_1 , b_2 , c_1 , and c_2 are estimable parameters, a_i is the provincial effect, a_t is the year effect, and e_{it} is an i.i.d. error term. GDP is measured in 1990 constant terms and enters the model in logarithm. We use its one-year lagged value instead of the lagged three-year moving average because GDP is used to control for the other sources of finance in year t , rather than serving as an explanatory variable. The same thing is true for PRIVATE, which, according to H1, enters the model to control for the amount of formal credit allocated to the private sector. The provincial effect is arguably strong because of the heterogeneities among the Chinese provinces. The period covered by our dataset was quite volatile in terms of both domestic and international macroeconomic situations. China itself has experienced relatively high inflation in the first half of the 1990s and then serious deflation in the late 1990s. Internationally, the Asian Financial Crisis had a clear impact on China, especially in 1998 and 1999. Therefore, it is important to control for the macroeconomic conditions in different years. For these reasons, the two-way panel model in equation (1) is appropriate. We estimate this model by both the fixed effect and the random effect panel method and present the results of OLS estimation for comparison.

The results of the estimation of equation (1) are presented in Table 2. Both the LR test and the F test show that the two panel models fit the data much better than the OLS model, but the Hausman test shows that the fixed-effect model is inefficient than the random-effect model (the P-value of the test is 0.272). In addition, the results of the OLS model and the random-effect model largely agree with each other. So we base our discussion on the results of the random-effect model. The most important result is that H1 is confirmed: the coefficient of $\ln(CASES)$ is significantly negative at the 5% significance level. With an estimate at -0.112 , it implies that when a province with the least effective legal system (with a value of CASES at 0.54) improves to the level of the province with the most effective legal system (with a value of CASES at 1.09), i.e., when its legal system is enhanced by 100%, its share of private investment will decrease by 11.2 percentage points, more than one fourth of the sample average.

There are three significant variables in the set of the control variables. The state share of industrial output has a strong detrimental effect on the share of private

investment. An increase of one percentage point of the variable STATE leads to a reduction of 0.22 percentage points in PRIINV. Therefore, a larger state sector does have a crowding-out effect on private investment. One other significant variable is ENROLL. An increase of one percentage point in ENROLL leads to about 1.1 percentage point increase in PRIINV. With a smaller statistical significance, TRADE is shown to have a positive effect on private investment. If TRADE is increased by one percentage point, PRIINV will increase by 0.05 percentage point, a quite small effect. All the other control variables are insignificant. Our expected positive effects of FDI and social capital fail to come true, as does the expected negative effect of government spending.

PRIVATE_1 and LNGDP_1 are also insignificant although they have positive signs. PRIVATE_1 is shown to be highly significant in the OLS regression, though. This means that both private investment and private credit are highly correlated with uncontrolled provincial and time effects. When the provincial and time effects are controlled, the linkage between private investment and private credit is quite weak. This may be caused by the rationing nature of the credit received by the private sector. The insignificance of LNGDP_1 either implies that per-capita GDP is not an adequate control for private sector's sources of finance, or implies that those sources are indeed not important for private investment. Judging by the private sector's heavy reliance on self-finance and the informal credit market to make investment as reported in Garnaut et al. (2000) and other sources, it is likely the case that per-capita GDP is not a good control. This observation actually reinforces our confidence in the estimate of the leakage effect because a better control of the other sources of finance could only enhance the estimate, a claim that will be supported by our test of H2.

The model for testing H2 is a reduced version of model (1):

$$(2) \quad \overline{PRIINV}_{it} = a_0 + b_1 \overline{CASES}_{it-1} + b_2 \overline{X}_{it-1} + a_i + a_t + e_{it},$$

in which the definitions of the variables and coefficients are the same as those in (1). The results of the estimation are reported in Table 3. The two panel models continue to outperform the OLS model and the random effect model continues to be more efficient than the fixed-effect model (the P-value is 0.124). Therefore, the results of the random-effect model will still be those that we consult. They largely repeat what we found in model (1) except TRADE now turns insignificant. Ln(CASES) is still significantly negative, but both its magnitude and statistical significance are slightly reduced. This is consistent with our theoretical discussion. Since this reduced estimate is obtained when the two control variables, PRIVATE_1 and LNGDP_1, are taken out of the regression, this result supports our claim made for the test of H1, that is, we would obtain a stronger estimate for the effect of Ln(CASES) if better controls for the other sources of finance were used to substitute for LNGDP_1.

Our finding that enhanced rule of law *reduces* the private share of investment shows that the leakage effect is very strong as to outweigh the rule of law's possible positive effects on private credit and the private sector's other sources of finance. The negative gross effect of the rule of law on private share of investment is significant. If the least effective province improves its legal system by 100%, its share of private

investment will decrease by 10.2 percentage points. We will see in the next section that this reduction has a significant implication for GDP growth.

Tests of H3 - H5

Replacing PRIINV by PRIVATE, DEPTH, and COMP, respectively, equation (2) is a ready model to test H3-H5. The results are presented in Tables 4-6. In all the three tests, the panel models outperform the OLS model and the random-effect model is shown to be inadequate (that is, the provincial and year dummies are correlated with the regressors). We will carry out our discussion by mainly referring to the results of the fixed-effect model, but will also frequently compare them with the results of the other two models.

In the test of H3, all the variables except FDI are significant in the fixed-effect model. In particular, $\ln(\text{CASES})$ is shown to be significant at the 1% significance level with a coefficient of 0.111. Indeed, this variable is also highly significant in the OLS and random-effect regressions. Therefore, H3 is strongly confirmed. The contrast between the test result of H3 and those of H1 and H2 is interesting. It shows that the share of private investment does behave differently from the share of private credit, a result that reinforces the existence of the leakage effect.

Among the control variables, GOV and TRADE have positive effects on the share of private credit, and STATE, ENROLL, and ASSOCs have negative effects. The results on TRADE and STATE make immediate sense, but the results on GOV, ENROLL and ASSOCs are puzzling. It is noteworthy that the fixed-effect model shows different results for these three variables than the other two models. GOV and ASSOCs are insignificant in the OLS model and the random-effect model and ENROLL even has significantly positive effect in those two models. This implies that those three variables are highly correlated with the provincial fixed-effect. For example, both PRIVATE and ENROLL are positively correlated with the provincial fixed-effect by some unknown form, so we have a positive sign for ENROLL in the OLS and random-effect models. However, it is quite possible that some provinces have larger improvements in primary school enrollment but nevertheless have smaller improvements in the share of private credit. Some inland provinces may fit well into this scenario because their enrollment rates are low so improvements are easier to bring about compared with the coastal provinces whereas they do not offer as much bank credit to the private sector as the latter group of provinces does. At any rate, the fixed-effect results show that both the share of private credit and the three variables in concern, GOV, ENROLL and ASSOCs, are jointly determined by unobserved factors and the improvements of these three variables alone may not lead to a higher share of private credit.

Turning to the test results of H4 presented in Table 5, we find that the fixed-effect model only offers two significant coefficients, for GOV and STATE, to be exactly, while the OLS and random-effect models show that every coefficient is strongly significant. So most of the variables and DEPTH have strong joint correlations with the provincial fixed effect. The strong positive effects of GOV and STATE shown by all the three models are somewhat surprising but make sense. Government spending

in China is usually supplemented by bank credit. This is particularly true in infrastructure projects. So GOV exhibits a strong positive effect on the amount of loan issued by the bank. In addition, the positive effect of STATE can be explained by the Chinese banking system's strong favor toward the state sector and lends weights to our premise that the formal credit is highly rationed toward the private sector.

Regarding the test of H4, we have an "irrelevance" result in the fixed-effect model: the improvement of the rule of the law does not have a significant, either positive or negative, impact on DEPTH. However, both the OLS and the random models show that there is a strong and positive impact. To the extent that the fixed-effect model is the best model to fit the data, we have to conclude that this positive impact is spurious in the sense that it is related to unobserved provincial characteristics that have a positive effect on both the rule of law and financial depth. Interpreted in another way, this means that merely improving the rule of law does not lead to a deeper financial market. This result again supports the existence of the leakage effect. We support this claim by the following three-step reasoning. First, because the share of private credit increases with the enhancement of the legal system, the amount of private credit must have increased faster than the amount of credit received by the state sector. Second, since the total amount of credit is unchanged as the legal system improves, the above conclusion must lead us to a further conclusion that the credit received by the state sector is reduced by an enhanced legal system. Finally, there is only one way that an enhanced legal system leads to a reduction of the credit to the state sector, that is the legal system's blocking of the leakage process.

Lastly, Table 6 shows that H5 is verified, regardless which model we stick to. However, quantitative differences do exist between the fixed-effect model and the two other models. While the two other models show that $\ln(\text{CASES})$ has quite economically significant effects on bank competition, its effect found in the fixed-effect model is considerably smaller, especially when it is compared with the OLS result. This shows that the provincial fixed effect does take away a considerable part of the explanatory power of the rule of law. Nevertheless, the result that a positive effect does remain after the fixed-effect is controlled for implies that improving the legal system alone is still useful, although the marginal effect may be small (a 100% enhancement of the legal system leads to an increase of the share of other banks' credit by 9 percentage points).

Among the control variables, only two variables, FDI and ASSOCs, are significant in the fixed-effect model. FDI is shown to have a positive effect although the magnitude is almost negligible. Again, ASSOCs is shown to have a negative effect, which contradicts to the OLS result once more. In fact, we have not found any significantly positive effect of ASSOCs in all the regressions that are deemed appropriate for the data. In the occasions that we did find a positive effect, it nevertheless arise from its correlation with the provincial fixed effect. Therefore, unless our use of ASSOCs as a measure for social capital is inadequate, social capital does not play a significant role to foster financial development in China.¹²

¹² A minute's pause realizes that this measure may indeed be inadequate to measure social capital in Chinese provinces. Most of the registered associations in China are attached to the government, so they may not be

5. The effectiveness of the law and economic growth

We run five regressions to explore the linkage between the effectiveness of the law and economic growth. The results of these five regressions are presented in Table 7. The dependent variable of the regressions is the average growth rate (in percentage term) of the period of 1992-2001, and the explanatory variables take their value of 1991. This specification is consistent with what has been done in the literature (see Levine 1997 for a review).

In Model I-III, we explore the relationship between the four indicators of financial development and the growth rate. Model I only has the four indicators and the logarithm of the per-capita GDP of 1991 in the regression. The 1991 GDP is added to control provincial heterogeneity at the starting point. Among the four financial indicators, only PRIINV has a significantly positive coefficient. The magnitude of this coefficient is large: an increase of one percentage point of the share of private investment leads to an increase of 0.81 percentage points in the growth rate. The regression shows that there is a strong tendency of divergence among the Chinese province as 1% increase in the 1991 per-capita GDP leads a province to grow faster by 1.2 percentage points in the subsequent ten years. However, this strong tendency of divergence no longer holds once we move to the other models when more controls are added. In Model II, the control variables that we used before are added. PRIINV is still the only significant variables among the four financial indicators, but its magnitude is reduced to 0.62 percentage points of the growth rate for one percentage point increase in itself. Among the control variables, only STATE is significant. A province with a larger state industrial sector falls strongly behind other provinces: an increase of one percentage point in the industrial share of the state sector reduces a province's average growth rate by 0.79 percentage points. Model III then adds two regional dummies to denote the central and western provinces, respectively (the east coast is used as the reference region). We do so because some recent studies (e.g., Xu, forthcoming) have shown that there is evidence for club convergence among the Chinese provinces. Nevertheless, this kind of convergence is statistically highly insignificant in our regression although the sign of the logarithm of the 1991 per-capita GDP does turn to be negative. PRIINV continues to be the only significant financial indicator and its magnitude is almost unchanged compared with Model II. In addition, STATE remains significantly negative although the size of its effect is reduced. However, there are also two new results. FDI and ASSOCs now have significantly positive and economically meaningful effects on the growth rate.

In summary, the share of private investment is the only indicator of financial development that shows a consistent positive and strong effect on economic growth. The strong positive linkages between other indicators of financial development and economic growth found in cross-country study do not show up. The short time period covered by our study may be responsible for these results. In the literature, 20 to 30

organized on a voluntary basis. There is evidence to show that some truly voluntary associations or business chambers do not register with the government (Yao, 2003). However, ASSOCs is the variable that we can get to provide the closest proxy for social capital in each province.

year average growth rates are studied, whereas we only study 10-year average growth rates. Nevertheless, our results do match the Chinese reality since the early 1990s, that is, the private sector has become the engine of China's overall economic growth, and the state sector has become a burden of its growth (Garnaut et al., 2000). In addition, the paramount importance of private investment implies that improving the legal system alone has a detrimental effect on economic growth. By our early estimation, if the province with the least effective legal system made an improvement to reach the level of the most effective province, its share of private investment would be reduced by 10.2 percentage points. Using the conservative estimate provided by Model II and III, this reduction would lead to a fall of the growth rate by about 0.7 percentage points. This is about 8% of China's average growth rate in the 1990s, which implies a loss of about 8 billion US dollars each year.¹³

To gauge the gross effect of the improved effectiveness of the law, we run Models IV and V. The four indicators of financial development are left out. Model IV does not include the regional dummies whereas Model V does. STATE continues to be highly negative in both models, and ASSOCs take a significantly positive sign in Model V. In addition, Model V shows a tendency of strong club convergence. However, since this finding highly depends on model specification, it is premature to take it as firm evidence for convergence.

The important result of Models IV and V is that both models show that the effectiveness of the law does not have a significant impact, be it positive or negative, on the growth rate. This insignificant result may arise for the following two combined reasons. On the one hand, the improvement of the legal system has mixed impacts on the four indicators of financial development, and the only indicator that contributes positively to growth, i.e., the share of private investment, is reduced by improved effectiveness of the law. On the other hand, improvements made to the legal system may not have a significant impact on the other aspects of the economy. However, the result can also be a consequence of the short time period covered by our study. If this is true, it is premature to draw a definite conclusion regarding the gross effect of the rule of law on economic growth.

6. Concluding remarks

Our empirical endeavor has established the following robust results: improving the rule of law alone in an economy with financial repression does not lead to overall financial development; instead, it has a fairly large negative effect on economic growth by reducing the share of private investment in the economy. We have found that this negative effect comes from the law's adverse impact on the leakage effect that moves financial resources from the inefficient state sector to the efficient private sector.

While our results provide a partial answer to the "China paradox" of weak law and rapid economic growth, we do not mean to refuse the proposition that the rule of law promotes economic growth. Rather, our results are best interpreted as evidence

¹³ China's GDP has been growing by roughly 100 billion US dollars each year in recent years.

showing that the law is but one factor in the institutional nexus. For the legal system to work properly, improvements in other complementary institutions are needed.¹⁴ This finding echoes the findings of Berkowitz et al. (2003) who find that the social and economic context is important to make transplanted laws work in the recipient country. But we have gone one step further to conduct a structural analysis of how and under what conditions the legal system works for or against financial development.

The findings in this paper also provide a hint for the sequence of reform in transition countries. While it is an ultimate goal, strengthening the legal system nonetheless should not be an urgent concern when the economy is still stranded by multiple market and institutional failures. With the space left out and, hopefully, with the supplement of informal enforcement mechanisms, private agents can innovate ways and means to overcome the failures and bring the economy closer to socially optimal outcomes.¹⁵ It is more urgent for a transition country to remove market and institutional rigidities that provide fertile soil for rent-seeking behavior than to strengthen the legal system. With the rigidities in place, unlawful activities are deemed to arise. In the context of China, the gains will be much larger to reform the banking system, liberalize the interest rate regime in particular, than to improve the legal system.

¹⁴ This assessment is not new. See, for example, Milgrom and Roberts (1990) and Aoki (2001).

¹⁵ This view is also presented in Hay and Shleifer (1998) in the Russian context, but from a somewhat different angle.

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Table 1. Descriptive statistics of the variables (290 cases)

	Minimum	Maximum	Mean	Std. dev.
DEPTH	0.54	2.53	1.03	0.31
PRIVATE	0.04	0.35	0.16	0.07
COMP	0.00	0.59	0.36	0.12
PRIINV	0.00	0.70	0.39	0.14
CASES	0.54	1.09	0.95	0.09
GOV	0.05	0.24	0.12	0.04
STATE	0.10	0.85	0.49	0.18
FDI	0.00	0.89	0.41	0.51
TRADE	0.03	0.79	0.31	0.42
ENROLL	0.84	1.00	0.98	0.03
ASSOCs	0.03	0.30	0.16	0.06

Table 2. Test of H1, dependent variable = PRIINV

	Two factor model					
	OLS		Fixed effect		Random effect	
	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.
Constant	0.036	0.353	-0.242	0.836	-0.752	0.577
Ln(CASES)	-0.106*	0.062	-0.097	0.061	-0.112**	0.059
GOV	-0.241	0.286	0.729	0.468	0.223	0.406
STATE	-0.353***	0.069	-0.079	0.113	-0.215**	0.100
FDI	0.031	0.020	-0.036	0.034	-0.021	0.031
TRADE	0.003	0.022	0.036	0.033	0.051*	0.030
ENROLL	0.610	0.561	0.771	0.574	1.062**	0.501
ASSOCs	0.234	0.144	-0.322	0.295	-0.056	0.241
PRIVATE_1	0.297***	0.105	0.024	0.116	0.075	0.111
LNGDP_1	-0.013	0.014	-0.015	0.058	0.020	0.032
R-squared	0.501		0.778		0.892	
P-value for Hausman test: 0.272						

*, **, and *** represent significance at, respectively, the 10% significance level, the 5% significance level, and the 1% significance level.

Table 3. Test of H2, dependent variable = PRIINV

	OLS		Fixed effect		Random effect	
	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.
Constant	0.069	0.356	-0.382	0.531	-0.499	0.491
Ln(CASES)	-0.094	0.057	-0.094	0.059	-0.102*	0.058
GOV	-0.242	0.288	0.736	0.464	0.210	0.401
STATE	-0.409***	0.066	-0.077	0.111	-0.244***	0.095
FDI	0.026	0.020	-0.037	0.033	-0.014	0.030
TRADE	0.000	0.022	0.039	0.032	0.055	0.029
ENROLL	0.521	0.344	0.789	0.544	0.989**	0.491
ASSOCs	0.044	0.116	-0.319	0.291	-0.031	0.231
R-squared	0.481		0.784		0.901	
P-value for Hausman test: 0.124						

*, **, and *** represent significance at, respectively, the 10% significance level, the 5% significance level, and the 1% significance level.

Table 4. Test of H3, dependent variable = PRIVATE

	OLS		Fixed effect		Random effect	
	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.
Constant	-0.034	0.205	0.851***	0.290	0.049	0.145
Ln(CASES)	0.114***	0.033	0.111***	0.032	0.106***	0.023
GOV	0.055	0.166	0.416*	0.253	0.047	0.117
STATE	-0.228***	0.038	-0.119**	0.061	-0.234***	0.027
FDI	-0.025	0.011	0.019	0.018	-0.023***	0.008
TRADE	0.004	0.012	0.048***	0.017	0.006	0.009
ENROLL	0.331*	0.201	-0.651**	0.291	0.252*	0.140
ASSOCs	-0.003	0.067	-0.357**	0.159	-0.024	0.048
R-squared	0.362		0.761		0.856	
P-value for Hausman test: 0.000						

*, **, and *** represent significance at, respectively, the 10% significance level, the 5% significance level, and the 1% significance level.

Table 5. Test of H4, dependent variable = DEPTH

	OLS		Fixed effect		Random effect	
	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.
Constant	-1.666**	0.791	-0.699	0.812	-1.633***	0.536
Ln(CASES)	0.570***	0.127	0.038	0.091	0.286***	0.076
GOV	1.930***	0.640	3.827***	0.710	2.383***	0.426
STATE	0.887***	0.147	0.608***	0.170	0.779***	0.099
FDI	0.118***	0.044	0.078	0.051	0.139***	0.030
TRADE	0.168***	0.048	0.041	0.049	0.129***	0.032
ENROLL	1.870**	0.812	0.871	0.822	1.841***	0.521
ASSOCs	0.952***	0.261	0.641	0.445	0.840***	0.190
R-squared	0.462		0.891		0.901	
P-value for Hausman test: 0.000						

*, **, and *** represent significance at, respectively, the 10% significance level, the 5% significance level, and the 1% significance level.

Table 6. Test of H5, dependent variable = COMP

	OLS		Fixed effect		Random effect	
	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.
Constant	-0.037	0.333	0.067	0.432	0.093	0.212
Ln(CASES)	0.250***	0.054	0.093*	0.048	0.132***	0.037
GOV	-1.200***	0.269	0.029	0.378	-1.073***	0.172
STATE	0.004	0.062	0.063	0.091	-0.020	0.041
FDI	0.005	0.018	0.047*	0.027	-0.007	0.012
TRADE	0.008	0.020	-0.010	0.026	0.031**	0.013
ENROLL	0.525*	0.322	0.317	0.437	0.409**	0.205
ASSOCs	0.181*	0.109	-0.440*	0.237	-0.009	0.070
R-squared	0.360		0.845		0.864	
P-value for Hausman test: 0.000						

*, **, and *** represent significance at, respectively, the 10% significance level, the 5% significance level, and the 1% significance level.

Table 7. Results of the growth rate (29 cases)

	Model I		Model II		Model III		Model IV		Model V	
	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.	Estimate	St. err.
Constant	0.346	4.512	12.600	9.000	24.600	8.838***	11.300	9.656	26.103***	10.059
Ln(CASES)							0.142	1.212	-0.230	1.068
DEPTH	-0.690	1.712	1.031	1.101	0.914	1.121				
PRIVATE	-0.757	5.212	-1.578	3.605	-3.032	3.246				
PRIINV	8.053***	2.526	6.219***	1.919	6.281***	1.767				
COMP	1.030	4.119	-4.565	3.221	-0.193	3.915				
GOV			3.855	7.716	2.789	6.606	3.231	9.180	2.110	7.983
STATE			-7.913***	2.989	-5.278*	2.724	-9.361***	2.865	-7.023**	3.225
FDI			1.682	1.136	2.564*	1.515	0.854	1.981	0.637	1.046
TRADE			0.023	0.815	-0.552	0.918	0.253	0.812	0.410	0.732
ENROLL			0.031	0.123	-0.088	0.111	0.097	0.104	-0.018	0.095
ASSOCs			0.553	0.558	0.857**	0.423	0.666	0.607	0.960**	0.503
Ln(GDP)	1.210*	0.701	-0.443	0.616	-0.743	0.745	-0.712	0.681	-1.309*	0.748
Central					0.187	1.123			-0.467	0.946
West					-1.359	0.957			-2.016*	1.074
R-squared	0.545		0.884		0.927		0.794		0.855	

*, **, and *** represent significance at, respectively, the 10% significance level, the 5% significance level, and the 1% significance level.