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Property Rights, Finance, and Reinvestment: Evidence from China's Private Enterprises

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The existing studies have failed to find conclusive results on the relative importance of property rights protection and access to external finance for enterprise reinvestment partly due to their lack of control for the endogeneity problems. In this study, using data of China's private enterprises, we re-investigate this issue by carefully addressing the endogeneity issues. We find that property rights protection is more important for the reinvestment decision than the access to external finance. Our study demonstrates forcefully that, China is no different from other transition economies regarding the fundamental importance of property rights security to firm performance.

Key Words: Property rights protection; Access to external finance; Reinvestment decision; China economy.

JEL Classification Numbers: P14, G34, L25, D23.

1. INTRODUCTION

Recently a large body of studies demonstrates the importance of property rights protection for firm performance and economic growth.[1] Meanwhile, there is another line of research showing that financial sector development and hence firms' access to external finance is also important for economic performance and growth.[2] An intellectually intriguing question then is which of these two types of institutions is relatively more important. The answer to this question would also have implications for policy

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[1]For example, see Besley (1995); Knack and Keefer (1995); Mauro (1995); La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999); Acemoglu, Johnson, and Robinson (2001, 2002); and Jacoby, Li, and Rozelle (2002). For a recent survey, see Acemoglu, Johnson, and Robinson (2005).

[2]For example, see King and Levine (1993); Demirgüç-Kunt and Maksimovic (1998); Levine and Zervos (1998); Rajan and Zingales (1998); Levine, Loayza, and Beck (2000); and Claeseens and Laeven (2005). For a recent survey, see Levine (2005).

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recommendations, especially for developing economies that strive to grow under imperfect institutions.

There are two existing studies examining the relative importance of property rights protection and access to external finance for transition and developing economies. Using data from Poland, Romania, Russia, Slovakia, and Ukraine, Johnson, McMillan, and Woodruff (2002) find that property rights protection is relatively more important than access to external finance for firms' profit reinvestment decision. However, using data from a World Bank survey of China's enterprises, Cull and Xu (2005) show that access to external finance is as important as property rights protection for firms' reinvestment decision. They argue that this difference stems from the stronger complementarity between internal and external finance in China; in addition, with the progress in transition in China in the early 2000s, supporting institutions including financial institutions become increasingly important for firm growth.

The conflicting and inconclusive results of the above two studies raise the question whether China really differs from other transition economies in terms of the relative importance of property rights protection and financial development. In our opinion, the different findings in the above two studies could be partially attributed to the lack of control for the endogeneity problems in estimations. Indeed, in concluding their study, Johnson, McMillan, and Woodruff (2002) acknowledge that "higher investment rates may lead to more secure property rights" (the reverse causality problem), and "higher reinvestment rates and more secure property rights may both reflect the optimism of the responding managers" (the omitted variables bias). Similar concerns apply to access to external finance. More optimistic managers could make higher profit reinvestment and feel more confident in obtaining external finance. Higher investment rates may create a larger investment demand that induces increases in the supply of external finance. Thus, without proper control for the endogeneity problems, it remains unclear whether property rights protection or access to external finance is more important for firms' reinvestment rate. In this study, we re-investigate the relative importance of property rights protection and access to external finance for a firm's reinvestment decision by carefully addressing the endogeneity problems.

The data set used in this paper is from the *Survey of China's Private Enterprises* conducted in 2000, with random sampling of private enterprises in all regions and industries for balanced representation.[3] To measure

[3]This is in contrast to the data of World Bank survey used by Cull and Xu (2005), which covers both private enterprises and state-owned enterprises. In China, state-owned enterprises conduct business under the auspices of national and regional governments, and therefore government expropriation is not a prominent concern. State-owned enterprises also receive favorable treatments from China's state-dominated financial system,

property rights protection and access to external finance, we follow the same approach used by Johnson, McMillan, and Woodruff (2002) and Cull and Xu (2005). Specifically, property rights protection is measured inversely as government expropriation, i.e., the ratio of extralegal payments to the government agencies and related parties over profits, with a higher value indicating poorer property rights protection. The variable gauging access to external finance is constructed on the basis of the reply to the survey question of how difficult it is to secure bank loans, with a higher value representing less difficulty in obtaining loans.

To control for the omitted variables bias, we include an extensive list of control variables, such as industry and region dummies, entrepreneurial characteristics (his/her human capital, political capital and social capital) and enterprise characteristics (size, age, profitability and perceived effectiveness of contract enforcement). Interestingly, with the stepwise inclusion of these control variables, the coefficient of access to external finance changes from statistically significant to statistically insignificant, whereas that of property rights protection remains highly significant. These results imply that property rights protection is relatively more important than access to external finance for firms' reinvestment decision. And they also highlight the importance of dealing with the omitted variables bias.

To further address the endogeneity problems, we use the two-step generalized method of moments (GMM) estimation. Specifically, following the recent literature on empirical industrial organization (e.g., Hausman, Leonard and Zona, 1994; Nevo, 2000, 2001), we use the average assessment of property rights protection and access to external finance by enterprises belonging to other industries located in the region as the instrumental variables for these two variables respectively. The two-step GMM estimation results confirm our earlier findings that property rights protection is relatively more important than access to external finance for enterprises' reinvestment decision.

Moreover, our findings are robust to the use of an alternative measure of access to external finance, to the exclusion of outlying observations, to the sub-sample of private enterprises started with 100 percent private ownership, to the inclusion of the availability of informal finance, and to the control of sample attrition problem.

To make sure that access to external finance is indeed not important for the reinvestment decision, we explore some scenarios in which access to external finance is expected to be important. Specifically, as pointed out by Johnson, McMillan, and Woodruff (2002), access to external finance is expected to be important when internal funds could be too limited for

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and thus face much fewer constraints in external finance than do private enterprises. So the inclusion of state-owned enterprises may bias the estimation results.

lumpy investment, or external funds could be preferred in the presence of weak property rights protection, or external funds could be less costly than internal funds due to state subsidy. Our results show that access to external finance remains unimportant even in those most favorable scenarios for the importance of external funds.

The remainder of the paper is structured as follows. The data and variables are described in Section 2, and the empirical results are presented in Section 3. The paper concludes with Section 4.

2. DATA AND VARIABLES

The data set used in this paper is from the *Survey of China's Private Enterprises* conducted in 2000.[4] To achieve a balanced representation across all regions and industries in China, the *Survey* used multi-stage stratified random sampling method. The total number of private enterprises to be surveyed was first determined. After that, six cities/counties were selected from each of the 31 regions (i.e., 22 provinces, 4 province-level municipalities and 5 minority autonomous regions), which included the capital city of the region, one prefecture-level city, one county-level city, and three counties. Next, the number of private enterprises to be surveyed in each region was determined by the product of the percentage of the region's share of private enterprises in the national total and the total number of private enterprises in the survey. The same method was used to determine the number of sample enterprises in every city/county and industry. Finally, private enterprises were randomly chosen for each sub-sample. The data set contains 3,073 initial observations.

Compared with the World Bank enterprise survey data set used in Cull and Xu (2005), this data set focuses on private enterprises and has a slightly larger sample size. Looking at private enterprises is interesting because they are most vulnerable to bureaucratic expropriation and discriminatory state bank lending policies when compared with state-owned enterprises and foreign-invested firms operating in China. China has been extremely enthusiastic with introducing foreign direct investment (FDI) by providing government support and legal protection. In contrast, China has been moving rather slowly and reluctantly in establishing various laws and regulations to protect domestic private business interests because of the leadership's ideological bias against them. Private enterprises often

[4]The *Survey* was conducted jointly by the United Front Work Department of the Central Committee of the Communist Party of China, the All China Industry and Commerce Federation, and the China Society of Private Economy at the Chinese Academy of Social Sciences.
The data set has been used by Bai, Lu, and Tao (2006), Li, Meng, and Zhang (2006), Li, Meng, Wang, and Zhou (2008), and Lu and Tao (2009).

complain about being harassed by local bureaucrats with informal fees and irregular levy payments (Du, Lu, and Tao, 2010). At the same time, China's state-dominated financial system has maintained a highly discriminatory lending policy. It channels the vast majority of financial resources to state-controlled firms. Private enterprises are typically marginalized and meet substantial difficulties in obtaining external finance from the formal financial system (Allen, Qian and Qian, 2005). It is reported that private enterprises list lack of access to external finance as a top concern (Asian Development Bank, 2003). Hence, private enterprises provide a good setting to examine the relative importance of property rights protection and access to finance in determining firms' profit reinvestment decisions.

TABLE 1.

Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Reinvestment Rate	1130	0.681	0.229	0.000	1.000
Expropriation	1130	0.049	0.068	0.000	0.529
Access to External Finance	1130	2.244	1.113	1.000	5.000
Average Assessment of Expropriation among Enterprises belonging to other Industries Located in the Same Region	1130	0.063	0.022	0.006	0.140
Average Assessment of Access to External Finance among Enterprises belonging to other Industries Located in the Same Region	1130	2.226	0.318	1.585	3.333
Education	1130	12.676	2.791	0.000	19.000
Age	1124	43.428	8.392	23.000	75.000
Managerial Experience	1129	4.038	6.936	0.000	58.000
Government Cadre	1130	0.083	0.276	0.000	1.000
CPC Membership	1130	0.173	0.378	0.000	1.000
CPPCC Membership	1130	0.452	0.498	0.000	1.000
Membership in Associations	1130	0.808	0.394	0.000	1.000
Social Status	1120	6.761	1.893	1.000	10.000
Enterprise Size	1092	4.179	1.328	0.693	9.903
Enterprise Age	1122	2.306	0.629	0.000	3.829
Profitability	763	0.125	0.190	0.001	1.988
Contract Enforcement	1130	0.104	0.305	0.000	1.000

The dependent variable in this study is the reinvestment rate, measured as the ratio of reinvestment over profits, and denoted by *Reinvestment Rate*. Table 1 reports summary statistics of the data. Referring to Table 1, the mean value of *Reinvestment Rate* is 0.681 ($\pm$0.229).[5]

[5]The sample size shrinks to 1,130, after the deletion of observations without information for constructing the dependent and two important independent variables of this study –reinvestment rate, property rights protection, and access to external finance.

The key explanatory variables are property rights protection and access to external finance. We follow the same approach as used in Johnson, McMillan, and Woodruff (2002) and Cull and Xu (2005) in measuring these two variables. Specifically, property rights protection is measured as the ratio of extralegal payments to government agencies and related parties over profits, and denoted by *Expropriation*, with a higher value indicating poorer protection of property rights. Referring to Table 1, *Expropriation* has a mean value of 0.049 and a standard deviation of 0.068, indicating significant variations across enterprises.[6] Access to external finance is constructed on the basis of the reply to the survey question of how difficult it is to secure bank loans, and denoted by *Access to External Finance*. The answer ranges from one to five, with a higher value representing less difficulty in obtaining loans. Referring to Table 1, *Access to External Finance* has a mean value of 2.244 and a standard deviation of 1.113.

To deal with the omitted variables bias, we control for entrepreneurial characteristics, enterprise characteristics, region dummies, and industry dummies. Variables related to entrepreneurial characteristics include: his/her human capital, i.e., *Age* (the age of an entrepreneur), *Education* (years of schooling), and *Managerial Experience* (years of having a managerial position before the entrepreneur started his/her own business); his/her political capital, i.e., *Government Cadre* (a dummy variable indicating whether the entrepreneur had been a government cadre before he/she started his/her own business), *CPC Membership*, and *CPPCC Membership*;[7] and his/her social capital, i.e., *Membership in Associations* (a dummy variable indicating whether an entrepreneur has a membership in the trade associations) and *Social Status* (perceived by the entrepreneur).[8] These entrepreneurial characteristics may affect the capability and incentives of entrepreneurs to expand business operations by reinvesting profits.

Enterprise characteristics include *Enterprise Size* (logarithm of employment), *Enterprise Age* (logarithm of years of establishment), and *Profitability* (return on assets). These enterprise characteristics demonstrate

[6]Much of the variations comes from the cross-region variations in the protection of private properties. Meanwhile, there are still some variations across enterprises within the same regions, which could be due to the underlying enterprise characteristics and entrepreneurial characteristics such as political connections (Li, Meng, and Zhang, 2006; Li, Meng, Wang, and Zhou, 2008).

[7]The Chinese People's Congress (CPC) is the highest organ of state power in China, while the Chinese People's Political Consultative Committee (CPPCC) is the advisory organ to the Chinese People's Congress and the government. According to statistics, 71.5% of the ninth CPC members (elected in 1998) were members of the Chinese Communist Party, whereas only 4.4% of the 10th CPPCC members (elected in 2003) were members of the Chinese Communist Party.

[8]Here *Social Status* is a categorical variable ranging from 1 to 10 based on the entrepreneur's reply to the survey question regarding his/her social status, with a higher value representing a lower social status.

TABLE 2.

Correlations among key variables

	Reinvestment Rate	Expropriation	Access to External Finance	Average Assessment of Expropriation among Enterprises belonging to other Industries Located in the Same Region	Average Assessment of Access to External Finance among Enterprises belonging to other Industries Located in the Same Region
Reinvestment Rate	1.0000				
Expropriation	−0.4274	1.0000			
Access to External Finance	0.1039	−0.0576	1.0000		
Average Assessment of Expropriation among Enterprises belonging to other Industries Located in the Same Region	−0.0133	0.1023	0.0063	1.0000	
Average Assessment of Access to External Finance among Enterprises belonging to other Industries Located in the Same Region	0.0392	−0.0684	0.2678	−0.0537	1.0000

whether the stage of life cycle the firm lies in and its financial performance provide sufficient incentives for entrepreneurs to reinvest profits and enlarge business operation scale. Since economic institutions mainly comprise property rights protection and contract enforcement, we also control for *Contract Enforcement*, which is a dummy variable indicating whether the enterprise uses the court to resolve business disputes. Controlling this variable helps us investigate whether the effectiveness of the court system in upholding commercial contracts affects the entrepreneurs' propensity to reinvest profits and expand business.

To address the potential endogeneity issues, we use the instrumental variable estimation. Specifically, following the recent literature on empirical industrial organization (e.g., Hausman, Leonard and Zona, 1994; Nevo, 2000, 2001), we use the average assessment of property rights protection and access to external finance by enterprises belonging to other industries located in the region as the instrumental variables for these two variables respectively. We discuss the identification strategy using these instruments in Section 3.

Descriptive statistics of all key variables and their correlations are given in Table 1 and Table 2, respectively.

3. EMPIRICAL ANALYSIS

3.1. Framework for Empirical Analysis

Johnson, McMillan and Woodruff (2002) provide a framework for understanding how property rights protection and access to external finance could be important for firms' profits reinvestment decision. The primary objective for firms to make investment is to achieve reasonable returns. When considering whether they would reinvest profits, private firms are clearly affected by the perceived security of property rights protection in the region. This is because the risk of government expropriation – the measure for property rights protection in this study – directly affects the gross returns from any reinvestment.

Meanwhile, Johnson, McMillan and Woodruff (2002) provide three reasons for why the access to external finance may have an impact on private firms' reinvestment decision. First, the lumpy investment required and the limited internal funds may prompt private firms to seek external funds to complement retained profits for investment. Private enterprises are relatively small in size when compared with their state-owned or foreign peers and thus the size of retained profits may be relatively small, even though their profitability could be higher than their peers.[9] As a result, private firms tend to have limited internal funds for reinvestment, and hence gaining access to external finance could be a critical factor in affecting profits reinvestment rate. In other words, while the pecking-order theory of financing suggests the use of first internal funds and then external funds (Myers and Mailuf, 1984), the constraint of the internal funds quickly becomes binding.[10] Second, when property rights are insecure, the usual pecking order of using first internal funds and then external funds may no longer apply, as entrepreneurs may prefer to use external funds (hence the importance for the access to external finance) in fear of their investment being expropriated by the local and central governments.[11] Third, it is possible

[9]State-owned enterprises typically outgrow private firms under the auspices of local and central governments. Foreign-invested firms are typically affiliates of foreign multinational enterprises that receive support from their parent companies and host region governments because of China's favorable policy to attract FDI.

[10]The basic premise of the pecking-order theory is that entrepreneurs have better information about their own firms' business prospects than outside investors, as a result of which the cost of external funds is usually higher than the cost of internal funds owing to the risk premium charged by the outside investors. Since the cost of external funds is expected to be higher than the cost of internal funds, firms would exhibit a pecking order in the utilization of funds, i.e. firms rely primarily on internally generated funds for business expansion. Only when the firm's investment demand exceeds the maximum amount of internal funds available for investment does the firm seek external funds to fill the gap in investment funds.

[11]The other side of the coin is that external financial institutions could become wary of extending loans to private enterprises operating in regions with poorer property rights protection, though this is less of a concern for state-owned financial institutions.

that the cost of external funds could be lower than that of internal funds because of state subsidy. As a result, when considering their investment, firms may first use external funds and then internal funds. Thus, the access to external finance becomes important for firms' reinvestment decisions.

In empirical analysis, we can investigate whether property rights protection mainly shapes firms' profit reinvestment decisions by conducting a regression of reinvestment rate on the perceived security of property rights along with a series of entrepreneurial characteristics, enterprise characteristics, and industry and region dummies. A negative and statistically significant estimated coefficient of the explanatory variable of *Expropriation* testifies to that property rights protection is essential for firm's reinvestment.

At the same time, as stated above, firms may need external finance to complement internal capital under some circumstances. Under this scenario, we can test the relative importance of property rights protection and access to external finance in determining firms' profit reinvestment rate by including in our regression analysis both property rights security and access to external finance as well as entrepreneurial characteristics, enterprise characteristics, and industry and region dummies.

For regression analysis, we conduct OLS estimation first. As mentioned above, we face the potential omitted variable bias and reverse causality bias. In order to obtain a reliable conclusion, we need to carry out GMM estimation by addressing the endogeneity issue. Based on the GMM results, we can have the following inferences. If access to external finance is statistically insignificant but property rights protection remains statistically significant, we can claim that property rights protection is of primary importance, whereas external finance constraint is of secondary importance as in Johnson, McMillan and Woodruff (2002). If both property rights protection and access to external finance produce positive and statistically significant estimated coefficients, we conclude that they are both important in determining profit reinvestment as claimed by Cull and Xu (2005). If the estimated coefficient of property rights protection loses statistical significance while access to external finance remains significant, then we can claim that property rights security is not a primary determinant of profit reinvestment, while the availability of external finance is essential to business expansion through complementing profit reinvestment.

To make the comparison of relative importance of property rights protection and access to external finance more powerful, we need to capture as much as possible the circumstances under which access to external finance is highly relevant for firms' reinvestment decisions. To this end, we conduct some further regression analysis in some subsamples (e.g., firms most likely facing financial constraint, firms perceiving especially severe government expropriation, and firms being able to obtain bank loans at lower inter-

est rates) that correspond more closely to the above-mentioned scenarios where external finance is particularly important for profit reinvestment, and compare the statistical significance and hence the relative importance of property rights protection and access to external finance.

3.2. OLS Estimates

To investigate the impacts of property rights protection and access to external finance on reinvestment rate, we estimate the following equation:

$$\begin{aligned} y_{eir} &= \mu + \alpha \cdot Expropriation_{eir} + \beta \cdot Access\ to\ Externa\ Finance_{eir} \\ &\quad + X_{eir}\prime\gamma + \varepsilon_{eir} \end{aligned} \tag{1}$$

where y_{eir} is the reinvestment rate of enterprise e in region r and industry i; X_{eir} is a vector of control variables; and ε_{eir} is a random error term. To deal with the possible heteroskedasticity issue, we use the standard errors clustered at the industry-region level.

The OLS estimation results of equation (1) are reported in Table 3. In Column 1, we only include the industry and region dummies, which in the cross-section analysis effectively controls for all the possible industry- and region-level characteristics. It is found that *Expropriation* has a negative and statistically significant coefficient, while *Access to External Finance* has a positive and statistically significant coefficient. These results suggest that both property rights protection and access to external finance have positive impacts on enterprises' reinvestment decisions, which is consistent with the findings of Cull and Xu (2005).

In Column 2, we add control variables related to entrepreneurial characteristics (such as his/her human capital, political capital, and social capital). It is found that *Expropriation* has a negative and statistically significant coefficient, while *Access to External Finance* has a positive and statistically significant coefficient.

In Column 3, we further control for variables related to enterprise characteristics (such as size, age, and profitability), and the perceived quality of contract enforcement.[12] Interestingly, the estimated coefficient of *Access to External Finance* is no longer statistically significant, whereas that of *Expropriation* remains negative and statistically significant. With regard to the magnitude of impacts, a one-standard-deviation decrease in *Expropriation* is associated with a 0.46-standard-deviation increase in reinvestment rate.

[12]Note that with the inclusion of enterprise characteristics, there is a substantial drop in the sample size (i.e., from 1113 to 741). This is mainly due to the missing information about firm profitability. Later in one of the robustness checks, we investigate whether this sample attrition affects our main results.

TABLE 3.

OLS estimates

	1	2	3
Expropriation	−1.436***	−1.428***	−1.549***
	[0.097]	[0.099]	[0.141]
Access to External Finance	0.017***	0.015***	0.009
	[0.005]	[0.005]	[0.007]
Entrepreneurial Characteristics			
Education		0.003	0.005
		[0.002]	[0.004]
Age		0.000	0.001
		[0.001]	[0.001]
Managerial Experience		−0.003***	−0.003**
		[0.001]	[0.001]
Government Cadre		−0.026	−0.039
		[0.021]	[0.026]
CPC Membership		0.023	0.012
		[0.016]	[0.019]
CPPCC Membership		−0.010	−0.012
		[0.016]	[0.020]
Membership in Associations		0.014	0.015
		[0.019]	[0.022]
Social Status		−0.001	−0.004
		[0.004]	[0.005]
Enterprise Characteristics			
Enterprise Size			0.002
			[0.007]
Enterprise Age			−0.002
			[0.020]
Profitability			0.013
			[0.048]
Contract Enforcement			0.011
			[0.026]
Industry Dummy	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes
No. of Observation	1130	1113	741
R-squared	0.2387	0.2534	0.2612
p-value for F-test	0.0000	0.0000	0.0000

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively.

These results imply that with better control for omitted variables, only property rights protection is found to be important for enterprises' reinvestment decisions. These results suggest that property rights security is of primary importance for firms' profit reinvestment, while access to external finance is not that essential. In addition, contract enforcement does not produce statistically significant estimated coefficient, which implies that property rights security is much more important than contracting institutions in promoting business expansion (Acemoglu and Johnson, 2005). These results are in sharp contrast to the findings of Cull and Xu (2005), but are in line with those of Johnson, McMillan, and Woodruff (2002).

3.3. Instrumental Variable Estimates

While we have a comprehensive list of control variables (X_{eir}) in the OLS regression, one may still be concerned that there could be some omitted variables or reverse causality issues that bias our estimation results. For example, as pointed out by Johnson, McMillan, and Woodruff (2005), "higher investment rates may lead to more secure property rights" (the reverse causality issue), and "higher reinvestment rates and more secure property rights may both reflect the optimism of the responding managers" (the omitted variables issue).

To further check whether our earlier OLS estimates are biased or not due to the potential endogeneity issue, we use the two-step generalized method of moments (GMM) approach. Following the recent literature on empirical industrial organization (e.g., Hausman, Leonard and Zona, 1994; Nevo, 2000, 2001), we use the average assessment of property rights protection and access to external finance among enterprises belonging to other industries located in the region as the instrumental variables for *Expropriation* and *Access to External Finance*, respectively.

Note that with the inclusion of industry and region dummies, the only possible remaining omitted variables are at the industry-region level or individual enterprise-level. Thus, the average assessment of property rights protection (or access to external finance) among enterprises belonging to other industries located in the same region should not be correlated with industry-region level or individual enterprise-level characteristics, implying the satisfaction of the exclusion restriction condition for the two-step GMM estimation.

Meanwhile, note that with region dummies controlling for the absolute levels of property rights protection (or access to external finance) across different regions, the total assessment among enterprises of industry i and region r and the total assessment among enterprises of other industries in

region r should sum up to zero, i.e.,

$$\sum_{e} R_{eir} + \sum_{\substack{e' \\ j \neq i}} R_{e'jr} = 0,$$

where R_{eir} is the region-mean adjusted assessment of property rights protection (or access to external finance) by enterprise e in region r and industry i. So long as the assessment by enterprises in the same industry and same region is influenced by some common factors (i.e., $E\left(R_{eir} \cdot \sum_{e} R_{eir}\right) > 0$), then the average assessment among enterprises belonging to other industries located in the same region ($\frac{1}{N_r - n_{ir}} \sum_{\substack{e' \\ j \neq i}} R_{e'jr}$, where N_r is the total number of enterprises in region r and n_{ir} is the total number of enterprises in region r and industry i) is negatively correlated with the enterprise-level perception (R_{eir}), thereby implying the satisfaction of the relevance condition for the two-step GMM estimation.

The two-step generalized method of moments (GMM) estimation results are reported in Table 4. Columns 1-2 report the first and second stage regression results respectively when we do not include *External Finance* but treat *Expropriation* as the only potential endogenous variable. In the first stage regression, the average assessment of expropriation among enterprises belonging to other industries located in the same region is significantly negatively correlated with *Expropriation*, showing that the instrument variable is a strong one. The second-stage regression shows that *Expropriation* casts a statistically significant negative impact on profit reinvestment. In Columns 3-4, we add control variables related to entrepreneurial and enterprise characteristics, and find that the impact of property rights protection on profit reinvestment remains robust. These results demonstrate that the main findings in Johnson, McMillan and Woodruff (2002) (Columns 1-8 of Table 6 in their paper) regarding the primary importance of property rights security in shaping reinvestment decisions remains intact after taking account of the potential endogeneity issue.

More two-step GMM estimation results are reported in Table 5, where both *Expropriation* and *External Finance* – the two potential endogenous explanatory variables – are included. Columns 1-2 report the two first-stages of the two-step GMM estimation, in which *Expropriation* and *External Finance* are regressed on the average assessment of expropriation and access to external finance by enterprises belonging to other industries located in the region respectively. It is found that *Expropriation* is negatively and significantly related to the average assessment of expropriation by enterprises belonging to other industries located in the region (consistent with the intuition presented above), but not to the average assessment of access to external finance by enterprises belonging to other industries lo-

TABLE 4.

GMM estimates, expropriation

	1	2	3	4
	First Stage	Second Stage	First Stage	Second Stage
Dependent Variable	Expropriation	Reinvestment Rate	Expropriation	Reinvestment Rate
Expropriation		-1.834^{***}		-1.862^{***}
		[0.481]		[0.655]
Average Assessment of Expropriation among	-1.321^{***}		-1.170^{***}	
Enterprises belonging to other Industries	[0.177]		[0.224]	
Located in the Same Region				
Entrepreneurial Characteristics				
Education			0.001	0.005
			[0.001]	[0.003]
Age			−0.0003	0.001
			[0.0003]	[0.001]
Managerial Experience			0.0002	-0.003^{**}
			[0.0003]	[0.001]
Government Cadre			0.004	−0.038
			[0.011]	[0.025]
CPC Membership			−0.003	0.010
			[0.006]	[0.018]
CPPCC Membership			−0.005	−0.014
			[0.005]	[0.019]
Membership in Associations			0.003	0.016
			[0.007]	[0.021]
Social Status			−0.001	−0.004
			[0.001]	[0.005]
Enterprise Characteristics				
Enterprise Size			0.003	0.003
			[0.003]	[0.007]
Enterprise Age			−0.002	−0.002
			[0.005]	[0.020]
Profitability			−0.013	−0.017
			[0.010]	[0.050]
Contract Enforcement			−0.012	0.006
			[0.008]	[0.027]

cated in the region (Column 1). And *External Finance* is negatively and significantly associated with the average assessment of access to external finance by enterprises belonging to other industries located in the region (consistent with the intuition presented above), but not with the average assessment of expropriation by enterprises belonging to other industries

TABLE 4—*Continued*

Dependent Variable	1 First Stage Expropriation	2 Second Stage Reinvestment Rate	3 First Stage Expropriation	4 Second Stage Reinvestment Rate
Industry Dummy	Yes	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes	Yes
Shea Partial R-squared	0.0302		0.0276	
Anderson Canonical Correlation LR Statistic	[25.40]***		[14.18]***	
Cragg-Donald F Statistic	[55.54]		[27.32]	
Hausman test	[0.941]		[0.222]	
No. of Observation	1196	1196	741	741

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively.

located in the region (Column 2). These results suggest that the two instruments are strong and separable for the two endogenous variables. In addition, the Anderson canonical correlation LR statistic confirms that the instrumental variables are relevant. Furthermore, the large Shea partial R-squared, the Cragg-Donald F-statistic, and the Anderson-Rubin Wald test rule out the concern of weak instrument.

Column 3 reports the second-stage of the two-step GMM estimation. It is found that *Expropriation* still has a negative and statistically significant causal impact on reinvestment rate, whereas *External Finance* no longer has any significant impact on reinvestment rate. In terms of magnitude, a one-standard-deviation decrease in *Expropriation* is associated with a 0.50-standard-deviation increase in reinvestment rate. These two-step GMM estimation results remain robust to the control for the entrepreneurial and enterprises characteristics (Columns 4-6 of Table 5).

Falsification tests. The validity of our instrumental variable estimation hinges upon the satisfaction of the orthogonality condition of our instrumental variables, that is, the instruments should not be correlated with the error term. As a check on this orthogonality condition, we conduct a falsification test in the spirit of Angrist and Pischke (2009). Specifically, Angrist and Pischke (2009) suggest that if some outcome variables (e.g., pre-determined outcome variables) are obviously not affected by the endogenous variables, the instrumental variables should not have any statistically significant impact on these outcome variables. In our falsification tests, we use two pre-determined outcome variables, that is, gender of the entrepreneur (a dummy variable taking a value of one if the entrepreneur is a male and zero otherwise) and birthplace of the entrepreneur (a dummy variable taking a value of one if the entrepreneur was born in a medium or large city, and zero otherwise). As shown in Table 6, indeed, none of

TABLE 5.

GMM estimates, expropriation versus access to external finance

	1	2	3	4	5	6
	First Stage	First Stage Access to	Second Stage Reinvestment	First Stage	First Stage Access to	Second Stage Reinvestment
Dependent Variable	Expropriation	External Finance	Rate	Expropriation	External Finance	Rate
Expropriation			-1.683^{***}			$-1.546 * **$
			[0.526]			[0.578]
Access to External Finance			−0.035			−0.062
			[0.026]			[0.035]
Average Assessment of Expropriation among						
Enterprises belonging to other Industries	-1.265^{***}	1.794		-1.163^{***}	0.519	
Located in the Same Region	[0.190]	[2.363]		[0.239]	[2.617]	
Average Assessment of Access to External						
Finance among Enterprises belonging to other	−0.021	-3.262^{***}		−0.012	-3.139^{***}	
Industries Located in the Same Region	[0.019]	[0.363]		[0.031]	[0.508]	
Entrepreneurial Characteristics						
Education				0.001	−0.015	0.004
				[0.001]	[0.015]	[0.004]
Age				−0.0003	0.004	0.001
				[0.0003]	[0.005]	[0.001]
Managerial Experience				0.0002	0.004	-0.003^{**}
				[0.0003]	[0.005]	[0.001]
Government Cadre				0.008	−0.187	-0.049^{*}
				[0.011]	[0.144]	[0.026]
CPC Membership				−0.003	0.046	0.014
				[0.007]	[0.102]	[0.020]
CPPCC Membership				−0.005	−0.097	−0.017
				[0.005]	[0.084]	[0.022]
Membership in Associations				0.003	0.067	0.021
				[0.007]	[0.113]	[0.022]
Social Status				−0.001	0.037	−0.001
				[0.002]	[0.025]	[0.005]

our two instrumental variables has any statistical significance on these two outcome variables, suggesting that our instrumental variables may not be correlated with the error term.

In summary, our results show that after we use instrumental variable estimation to correct for the endogeneity problem, property rights protection entirely dominates access to external finance in shaping private enterprises' reinvestment decisions. These results reinforce the OLS estimation results reported in Column 3 of Table 3, in which with a large set of controls the

TABLE 5—*Continued*

	1	2	3	4	5	6
	First Stage	First Stage Access to	Second Stage Reinvestment	First Stage	First Stage Access to	Second Stage Reinvestment
Dependent Variable	Expropriation	External Finance	Rate	Expropriation	External Finance	Rate
Enterprise Characteristics						
Enterprise Size				0.003	0.065*	0.008
				[0.003]	[0.037]	[0.008]
Enterprise Age				−0.002	0.068	0.005
				[0.006]	[0.062]	[0.019]
Profitability				−0.010	0.199	0.024
				[0.011]	[0.326]	[0.052]
Contract Enforcement				−0.012	−0.159	0.000
				[0.008]	[0.118]	[0.029]
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Shea Partial R-squared	0.0280	0.0418		0.0274	0.0393	
Anderson Canonical Correlation LR Statistic		[26.34]***			[17.67]***	
Cragg-Donald F Statistic		[19.79]			[10.28]	
Hausman test		[5.593]*			[3.654]	
No. of Observation	1130	1130	1130	741	741	741

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively.

estimated coefficient of *External Finance* loses its statistical significance while the estimated coefficient of *Expropriation* remains statistically significant.

3.4. Robustness Checks

Alternative Measure of Access to External Finance. We use an alternative measure of access to external finance. It is the percentage of bank loans over total assets, an objective measure of access to external finance in contrast to the subjective measure (i.e., the perceived difficulty in obtaining bank loans) used in the early analysis. In the same vein, we use the average proportion of bank loans in total assets for the private enterprises engaged in different industries but in the same region as the instrumental variable in the GMM estimation. The OLS and the two-step GMM estimation results are reported in Columns 1-2 of Table 7, respectively. It is clear that property rights protection remains negative and statistically significant whereas access to external finance is statistically insignificant or even marginally negative. These results are consistent with our early findings that property rights protection is more important than access to external finance in determining enterprise reinvestment decision.

TABLE 6.

Falsification tests

	1	2	3	4
Dependent Variable	Gender		Birth Place	
Average Assessment of Expropriation among Enterprises belonging to other Industries Located in the Same Region	0.545		1.319	
	[0.722]		[1.074]	
Average Assessment of Access to External Finance among Enterprises belonging to other Industries Located in the Same Region		−0.152		0.124
		[0.099]		[0.215]
Entrepreneurial Characteristics				
Education	−0.002	−0.002	0.038***	0.038***
	[0.003]	[0.003]	[0.005]	[0.005]
Age	−0.001	−0.001	0.007***	0.007***
	[0.001]	[0.001]	[0.001]	[0.001]
Managerial Experience	0.002	0.002	−0.003*	−0.003*
	[0.001]	[0.001]	[0.002]	[0.002]
Government Cadre	0.000	0.000	0.062	0.062
	[0.034]	[0.034]	[0.057]	[0.057]
CPC Membership	−0.001	−0.002	−0.045	−0.046
	[0.018]	[0.018]	[0.040]	[0.040]
CPPCC Membership	−0.009	−0.009	0.071**	0.072**
	[0.017]	[0.017]	[0.031]	[0.031]
Social Status	−0.007	−0.007	−0.016*	−0.016*
	[0.005]	[0.005]	[0.009]	[0.009]
Enterprise Characteristics				
Enterprise Size	0.000	−0.001	0.004	0.004
	[0.006]	[0.006]	[0.011]	[0.011]
Enterprise Age	0.020*	0.02	0.007	0.007
	[0.012]	[0.012]	[0.021]	[0.021]
Profitability	−0.117**	−0.114**	0.021	0.023
	[0.058]	[0.058]	[0.073]	[0.073]
Contract Enforcement	0.031	0.030	−0.046	−0.046
	[0.019]	[0.019]	[0.030]	[0.031]
Industry Dummy	Yes	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes	Yes
No. of Observation	1337	1337	1173	1173
R-squared	0.0973	0.0981	0.3081	0.3077
p-value for F-test	0.0000	0.0000	0.0000	0.0000

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively.

TABLE 7.

Robustness checks

Specification	1	2	3	4	5	6
	Alternative Measure of Access to External Finance		Exclusion of Outlying Observations		Private Firms	
Estimation Method	OLS	GMM	OLS	OLS	OLS	GMM
Expropriation	−1.696***	−2.014**	−1.165***	−1.765***	−1.703***	−2.692***
	[0.166]	[0.928]	[0.120]	[0.436]	[0.192]	[0.608]
Access to External Finance	0.062	−0.455*	0.008	−0.001	−0.005	−0.045
	[0.068]	[0.243]	[0.008]	[0.027]	[0.011]	[0.056]
Entrepreneurial Characteristics						
Education	0.006	0.003	0.002	0.002	0.010**	0.008**
	[0.004]	[0.004]	[0.003]	[0.003]	[0.004]	[0.004]
Age	0.002	0.001	0	0	0.002*	0.002*
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Managerial Experience	−0.004***	−0.003***	−0.002	−0.002	−0.003*	−0.002
	[0.001]	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]
Government Cadre	−0.042*	−0.040	−0.028	−0.022	−0.038	−0.048
	[0.024]	[0.026]	[0.026]	[0.026]	[0.032]	[0.031]
CPC Membership	0.003	0.031	0.024	0.023	0.017	0.033
	[0.022]	[0.022]	[0.020]	[0.019]	[0.023]	[0.030]
CPPCC Membership	−0.015	−0.015	0.002	−0.003	0	−0.012
	[0.023]	[0.022]	[0.017]	[0.016]	[0.021]	[0.020]
Membership in Associations	0.021	0.005	−0.003	0.003	−0.013	−0.018
	[0.027]	[0.030]	[0.020]	[0.020]	[0.036]	[0.034]
Social Status	−0.002	−0.001	−0.006	−0.006	−0.011*	−0.009
	[0.006]	[0.006]	[0.004]	[0.004]	[0.006]	[0.008]
Enterprise Characteristics						
Enterprise Size	0.002	0.015	0.012*	0.014**	0.004	0.013
	[0.008]	[0.012]	[0.007]	[0.007]	[0.008]	[0.009]
Enterprise Age	−0.002	−0.013	0.004	0.003	−0.008	−0.009
	[0.018]	[0.017]	[0.016]	[0.017]	[0.024]	[0.027]
Profitability	0.001	−0.018	0.108***	0.096**	0.044	0.06
	[0.054]	[0.054]	[0.037]	[0.041]	[0.065]	[0.071]
Contract Enforcement	0.011	0.015	0.014	0.006	0.03	0.008
	[0.034]	[0.038]	[0.023]	[0.024]	[0.034]	[0.034]
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Shea Partial R-squared for Expropriation		0.0192		0.0271		0.0512
Shea Partial R-squared for Access to External Finance		0.0419		0.0465		0.0377
Anderson Canonical Correlation LR Statistic		[14.93]***		[12.71]***		[10.90]***
Cragg-Donald F Statistic		[11.56]		[12.72]		[5.97]
Anderson-Rubin Wald test						[20.54]***
Hausman test		[3.975]		[2.205]		[5.671]*
No. of Observation	623	623	634	634	402	402

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively. In the two-step GMM estimation, we only report the second-stage results to save space and the first stages include the same controls (results available upon request).

TABLE 7—*Continued*

	7	8	9	10	11
Specification	Inclusion of Private Loans		Check on Sample Attrition I		Check on Sample Attrition II
Estimation Method	OLS	GMM	OLS	GMM	GMM
Expropriation	-1.562^{***}	-1.211^{**}	-1.514^{***}	-1.417^{**}	-1.415^{***}
	[0.141]	[0.587]	[0.141]	[0.624]	[0.540]
Access to External Finance	0.010	-0.076^{**}	0.009	-0.059	-0.057^{*}
	[0.007]	[0.038]	[0.007]	[0.036]	[0.0]
Access to Private Loans	0.017	-0.101			
	[0.015]	[0.066]			
Entrepreneurial Characteristics					
Education	0.005	0.003	0.005	0.004	0.002
	[0.004]	[0.004]	[0.004]	[0.003]	[0.003]
Age	0.001^{*}	0.001	0.001^{*}	0.002	0.000
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Managerial Experience	-0.003^{***}	-0.002^{*}	-0.003^{**}	-0.003^{**}	-0.003^{**}
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Government Cadre	-0.038	-0.059^{**}	-0.042	$-0.-53^{**}$	-0.036
	[0.027]	[0.027]	[0.026]	[0.026]	[0.023]
CPC Membership	0.015	0.015	0.010	0.013	0.034^{*}
	[0.019]	[0.022]	[0.018]	[0.019]	[0.019]
CPPCC Membership	-0.011	-0.016	-0.013	-0.019	-0.012
	[0.021]	[0.023]	[0.020]	[0.022]	[0.017]
Membership in Associations	0.020	0.010	0.015	0.022	0.023
	[0.022]	[0.026]	[0.022]	[0.023]	[0.020]
Social Status	-0.005	-0.003	-0.003	-0.001	0.000
	[0.005]	[0.006]	[0.005]	[0.005]	[0.004]
Enterprise Characteristics					
Enterprise Size	0.001	0.005	0.000	0.005	0.010
	[0.008]	[0.008]	[0.007]	[0.008]	[0.007]
Enterprise Age	-0.001	0.015	0.000	0.006	0.003
	[0.020]	[0.021]	[0.020]	[0.019]	[0.015]
Profitability	0.021	0.038	0.009	0.019	
	[0.047]	[0.054]	[0.050]	[0.055]	
Contract Enforcement	0.010	0.001	0.016	0.008	-0.007
	[0.027]	[0.030]	[0.026]	[0.029]	[0.023]
Industry Dummy	Yes	Yes	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes	Yes	Yes
Shea Partial R-squared for Expropriation		0.0267		0.0266	0.0297
Shea Partial R-squared for Access to External Finance		0.0363		0.0413	0.0360
Shea Partial R-squared for Access to Private Loans		0.0328			
Anderson Canonical Correlation LR Statistic		$[21.72]^{***}$		$[17.79]^{***}$	$[25.53]^{***}$
Cragg-Donald F Statistic		[7.46]		[8.97]	[19.68]
Anderson-Rubin Wald test		$[11.05]^{***}$		$[10.08]^{***}$	$[17.67]^{***}$
Hausman test		[5.305]		[3.230]	$[6.223]^{**}$
No. of Observation	721	721	741	741	1074

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively. In the two-step GMM estimation, we only report the second-stage results to save space and the first stages include the same controls (results available upon request).

Exclusion of Outlying Obsevrations. One may be concerned that our results could be driven by some outliers. To address this issue, we exclude the top and bottom 1% of the sample. The OLS and the two-step GMM estimation results, reported in Columns 3-4 of Table 7, show that our findings on the relative importance of property rights protection and access to external finance remain robust to this sub-sample.

Excluding Privatized Enterprises. As some of the private enterprises in our data set were privatized from state-owned enterprises, which enjoy secure protection from the governments and have favorable access to external finance, one may wonder if our results are biased due to the inclusion of this type of privatized enterprises. For robustness check, we therefore restrict our analysis to the sub-sample of enterprises started as 100 percent of private ownership. As shown in Columns 5-6 of Table 7, our main results on the relative roles of property rights protection and access to external finance on reinvestment rate are robust to this sub-sample.

Inclusion of Private Loans. We consider the impact of informal finance on private firms' profit reinvestment. So far, we treat access to external finance as the availability of formal finance, i.e. bank loans from the formal banking system which is largely dominated by state-owned banks. It is well known that private enterprises are discriminated against under the financial repression regime in China and have tremendous difficulties in obtaining access to bank loans. However, financial sector underdevelopment does not seem to have seriously retarded firm growth simply because China's private enterprises have been innovative in using informal finance such as informal private loans from relatives, social networks or informal lending entities and trade credits from suppliers and clients to sustain business operations and expansion (Allen, Qian, and Qian, 2005). In this sense, informal finance has largely substituted formal finance as the major source of external finance so that access to formal external finance may no longer be of overarching importance in determining firm reinvestment.

In view of this possibility, we consider another dimension of access to external finance — access to informal private loans. In the Survey, there is a question asking whether firms have access to private loans provided by individuals or informal lending institutions, i.e. an informal unregulated credit market. Based on the answer, we generate a dummy variable, *Access to Private Loans*, and put it together with *Access to External Finance* and *Expropriation* in the OLS and the two-step GMM regressions. In the two-step GMM regression, we also use the average value of responses to the question on utilizing private loans for enterprises engaged in different industries in the same region as the instrumental variable for *Access to Private Loans*. As shown in Columns 7-8 in Table 7, *Access to Private Loans* does not produce statistically significant estimated coefficient. *Access to External Finance* generates a positive but insignificant estimated coefficient

in the OLS regression, but a negative and significant estimated coefficient in the GMM regression. This suggests that access to formal bank loans may substitute to some extent for reinvestment of internally generated profits. On the contrary, the estimated coefficients of *Expropriation* remain negative and statistically significant. Hence, after considering both formal and informal finance availability, our results demonstrate forcefully that the insecurity of property rights and the associated uncertainty of business prospects are still the primary deterrents of profit reinvestment in China, while financial constraint is of secondary importance.

Checks on Sample Attrition. Note that the drop in statistical significance of access to external finance upon the inclusion of enterprise characteristics is accompanied by a substantial reduction of sample size (i.e., about 33% drop from 1113 to 741 as shown in Table 3). The reduction of sample size is mainly caused by the missing values of enterprise profitability. This may raise the concern that our estimation results could be biased due to the sample attrition problem, i.e., enterprises with valid profitability figures could be different from those without. To address this possible concern, we conduct two robustness checks. First, we use a recently developed methodology on sample attrition bias by Wooldridge (2002, 2007). Specifically, in the first-stage we estimate the propensity of an enterprise to answer the survey question regarding enterprise profitability based on enterprise and entrepreneurial characteristics, and in the second-stage use the inverse of the estimated propensity as the sample weight in the main regressions. The OLS and the two-step GMM estimation results using this method are reported in Columns 9-10 of Table 7. It is found that the magnitude and significance of the estimated coefficients of both property rights protection and access to external finance are similar to our early results. Second, we simply do not include enterprise profitability in the two-step GMM estimation. The estimation results are reported in Columns 11 of Table 7. Note that the sample size increases from 741 to 1074; nonetheless, our main findings on the relative importance of property rights protection and access to external finance remain robust. Combined, these two exercises rule out the concern of sample attrition.

3.5. Discussion

So far we have shown that firms' reinvestment decisions are shaped primarily by property rights protection, whereas access to external finance plays an insignificant part. Recall that there are three possible reasons why the access to external finance could be important for the reinvestment decisions (as suggested by Johnson, McMillan and Woodruff (2002) and summarized in Section 3.1). Specifically, firms may need external finance to complement internal finance, as the internal funds could be too limited for lumpy investment, or external funds could be preferred in the pres-

ence of weak property rights protection, or external funds could be less costly than internal funds due to state subsidy. To make sure that access to external finance is indeed not important for the reinvestment decision, we explore some scenarios in which access to external finance is expected to be important according to the above three rationales. Our main results thus far on the unimportance of access to external finance would be further strengthened if access to external finance is found to remain unimportant even in these scenarios that are most favorable to the relevance of access to external finance for firms' reinvestment decision making.

Small firms. Small firms are more likely to be financially constrained and rely on external finance for firm growth, whereas large firms may well have alternative resources and abundant internal profits to sustain their business expansion.[13] Focusing on small firms could potentially make financial constraint binding and enhance the relevance and importance of external finance for profit reinvestment decisions. To see whether access to external finance would become more essential for small firms, we confine our regression analysis to the sub-sample of small firms defined as the group of firms with enterprise size below the sample median. In Columns 1-2 of Table 8, we report that access to external finance remains insignificant in both OLS and GMM regressions, and its estimated coefficient produces wrong sign in the GMM regression. In contrast, *Expropriation* continues to produce negative effects on reinvestment, and the effect is statistically significant in the OLS regression.[14] Hence, we conclude that even for the small firm sub-sample, property rights protection is still more important than access to external finance in shaping firms' reinvestment decisions.

Less profitable firms. Less profitable firms have fewer internal funds, and thus are more reliant on external finance in starting investment projects. To see whether access to external finance would become more important for those less profitable firms facing financial constraints, we conduct our regression analysis for the sub-sample of less profitable firms defined as the group of firms with below-sample-median profitability. In Columns 3-4 of Table 8, we see that *Access to External Finance* is either insignificant as in the OLS regression or significant but has wrong sign as in the GMM regression. On the contrary, *Expropriation* produces statistically significant negative effects on firm profit reinvestment rate. Hence, even for the less profitable firms that presumably face serious financial constraints, property

[13]Cull and Xu (2005) also examine the effects of firm size on profit reinvestment, and find that access to bank loans produces statistically significant effects on reinvestment only for small-sized firms.

[14]Note that in this GMM estimation, the instrumental variable may be a weak one as suggested by the small value of the Cragg-Donald F statistic. When the estimated coefficient of *Expropriation* is properly evaluated using Anderson-Rubin Wald test, it becomes statistically significant.

TABLE 8.

Discussion

	1	2	3	4	5	6
Specification	Small Firms		Less Profitable Firms		Bank Loans are Important	
Estimation Method	OLS	GMM	OLS	GMM	OLS	GMM
Expropriation	−1.325***	−1.560	−1.868***	−3.949***	−1.588***	−1.055*
	[0.199]	[1.015]	[0.185]	[0.877]	[0.156]	[0.621]
Access to External Finance	0.010	−0.045	0.017	−0.129*	0.003	−0.076*
	[0.012]	[0.058]	[0.014]	[0.071]	[0.009]	[0.041]
Entrepreneurial Characteristics						
Education	0.016**	0.015**	0.010	0.005	0.004	0.004
	[0.006]	[0.006]	[0.007]	[0.009]	[0.004]	[0.004]
Age	0.002	0.002	0.002	−0.001	0.001	0.001
	[0.001]	[0.002]	[0.001]	[0.002]	[0.001]	[0.001]
Managerial Experience	−0.005**	−0.004**	−0.004*	−0.003	−0.003**	−0.003*
	[0.002]	[0.002]	[0.002]	[0.002]	[0.001]	[0.001]
Government Cadre	−0.032	−0.040	0.020	0.052	−0.029	−0.044
	[0.043]	[0.045]	[0.032]	[0.060]	[0.024]	[0.027]
CPC Membership	−0.029	−0.036	−0.015	−0.02	0.012	0.022
	[0.053]	[0.053]	[0.031]	[0.055]	[0.022]	[0.022]
CPPCC Membership	−0.018	−0.037	−0.006	−0.036	−0.011	−0.013
	[0.033]	[0.034]	[0.031]	[0.045]	[0.020]	[0.023]
Membership in Associations	0.024	0.034	−0.039	0.024	0.022	0.021
	[0.031]	[0.032]	[0.049]	[0.062]	[0.025]	[0.023]
Social Status	−0.012	−0.010	−0.007	−0.014	−0.002	0.002
	[0.008]	[0.008]	[0.008]	[0.012]	[0.005]	[0.005]
Enterprise Characteristics						
Enterprise Size	−0.045**	−0.044**	0.008	0.034*	0.008	0.010
	[0.019]	[0.018]	[0.012]	[0.017]	[0.008]	[0.009]
Enterprise Age	0.031	0.038	0.059***	0.084***	0.005	0.014
	[0.029]	[0.027]	[0.021]	[0.028]	[0.019]	[0.019]
Profitability	0.039	0.04	−0.723	0.062	0.006	0.010
	[0.063]	[0.066]	[1.023]	[1.478]	[0.055]	[0.052]
Contract Enforcement	0.066*	0.074*	0.02	−0.077	0.023	0.021
	[0.035]	[0.038]	[0.036]	[0.051]	[0.029]	[0.033]
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Shea Partial R-squared for Expropriation		0.0227		0.0514		0.0254
Shea Partial R-squared for Access to External Finance		0.0363		0.0396		0.0349
Anderson Canonical Correlation LR Statistic		[12.59]***		[11.97]***		[16.37]***
Cragg-Donald F Statistic		[4.62]		[7.98]		[7.46]
Anderson-Rubin Wald test		[5.90]*		[6.927]**		[3.321]
Hausman test		[1.359]		[6.927]**		[3.321]
No. of Observation	325	325	330	330	645	645

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively. In the two-step GMM estimation, we only report the second-stage results to save space and the first stages include the same controls (results available upon request).

TABLE 8—*Continued*

	7	8	9	10
Specification	Severer Expropriation		Lower Interest Rate	
Estimation Method	OLS	GMM	OLS	GMM
Expropriation	−1.418***	−1.752***	−1.743***	−1.764**
	[0.157]	[0.620]	[0.192]	[0.803]
Access to External Finance	0.004	0.02	0.008	−0.131***
	[0.011]	[0.034]	[0.013]	[0.050]
Entrepreneurial Characteristics				
Education	−0.004	−0.005	0.004	−0.003
	[0.004]	[0.004]	[0.005]	[0.006]
Age	0.000	−0.001	0.001	0.000
	[0.001]	[0.001]	[0.001]	[0.002]
Managerial Experience	−0.001	−0.001	−0.004**	−0.003*
	[0.002]	[0.002]	[0.002]	[0.002]
Government Cadre	−0.023	−0.017	−0.019	−0.051
	[0.034]	[0.032]	[0.031]	[0.042]
CPC Membership	0.001	−0.006	−0.005	0.004
	[0.026]	[0.025]	[0.025]	[0.034]
CPPCC Membership	−0.029*	−0.033**	−0.001	−0.015
	[0.017]	[0.017]	[0.024]	[0.029]
Membership in Associations	−0.030	−0.030	0.013	0.039
	[0.028]	[0.025]	[0.034]	[0.037]
Social Status	0.001	0.000	0.000	0.005
	[0.005]	[0.006]	[0.006]	[0.008]
Enterprise Characteristics				
Enterprise Size	0.018*	0.018*	−0.003	0.001
	[0.010]	[0.010]	[0.009]	[0.012]
Enterprise Age	−0.009	−0.012	0.004	0.014
	[0.023]	[0.021]	[0.015]	[0.020]
Profitability	0.104	0.086	0.039	0.078
	[0.067]	[0.075]	[0.064]	[0.071]
Contract Enforcement	0.025	0.027	−0.015	−0.026
	[0.030]	[0.032]	[0.037]	[0.047]
Industry Dummy	Yes	Yes	Yes	Yes
Region Dummy	Yes	Yes	Yes	Yes
Shea Partial R-squared for Expropriation		0.0508		0.0183
Shea Partial R-squared for Access to External Finance		0.0534		0.0360
Anderson Canonical Correlation LR Statistic		[13.70]***		[6.51]**
Cragg-Donald F Statistic		[13.01]		[4.11]
Anderson-Rubin Wald test		[6.48]**		[12.23]***
Hausman test		[0.465]		[5.596]*
No. of Observation	363	363	418	418

Note: Standard errors, clustered at the industry-region level, are reported in the bracket. *, **, and *** represent significance at 10%, 5%, 1% level, respectively. In the two-step GMM estimation, we only report the second-stage results to save space and the first stages include the same controls (results available upon request).

rights security is still the primary determinant of firms' profit reinvestment decisions.

Firms reporting that bank loans are important. In the Survey, there is a question asking firms whether bank loans are important for firms' operations and development. Clearly, those firms with affirmative replies to this question are expected to face more serious financial constraints, in which case access to external finance is expected to be especially important. To investigate this possibility, we conduct a regression analysis for the sub-sample of firms replying affirmatively to the importance of bank loans. In Columns 5-6 of Table 8, we see that *Access to External Finance* is either insignificant as in the OLS regression or significant but has wrong sign as in the GMM regression. On the contrary, *Expropriation* consistently produces statistically significant negative effects on firm profit reinvestment rate. Hence, even for firms reporting the importance of bank loans, property rights security is still the primary determinant of firms' profit reinvestment decisions.

Firms facing severer expropriation. When firms facing severe expropriation, they may worry about the security of their investment, and hence may prefer to use external funds instead of internal funds, suggesting the importance for the access to external finance. To explore this scenario, we conduct a regression analysis for the sub-sample of firms whose perceived expropriation degree is above the sample-median. In Columns 7-8 of Table 8, we see that *Access to External Finance* is insignificant in both the OLS regression and the GMM regression. On the contrary, *Expropriation* is still negative and statistically significant. Hence, even in the situation where firms may seek external funds in fear of expropriation of their internal funds, access to external finance remains unimportant.

Firms facing lower interest rates. External funds may be preferred over internal funds when the former is less costly than the latter due to state subsidy. To explore this possibility, we conduct a regression analysis for the sub-sample of firms whose bank loan interest rates are below the state-stipulated interest rate.[15] In Columns 9-10 of Table 8, we see that *Access to External Finance* is either insignificant as in the OLS regression or significant but has wrong sign as in the GMM regression. On the contrary, *Expropriation* is still negative and statistically significant. Hence, even in the situation where firms may seek external funds because of their lower interest rates, access to external finance is still unimportant.

[15] In the *Survey*, there is a question asking firms whether their bank loan interest rates are below the state-stipulated interest rate. Based on the reply to this question, we extract a sub-sample of firms whose bank loan interest rates are below the state-stipulated interest rate.

In a nutshell, we do not find that access to external finance plays a significant role in shaping firms' profit reinvestment decisions in the several scenarios where it is most likely to be important. In contrast, property rights protection remains consistently significant in these scenarios. This strengthens our interpretation of our findings that property rights protection dominates external finance availability in shaping private enterprises' reinvestment decisions. On the one hand, property rights security could be an important determinant of obtaining external finance, as found by both Cull and Xu (2005) and Bai, Lu, and Tao (2006). In this sense, property rights security is more fundamental. On the other hand, property rights protection affects the security of assets perceived by private entrepreneurs and hence their incentives to expand their businesses through reinvestment.

4. CONCLUSION

The relative importance of property rights security and access to external finance for firms' profit reinvestment decision making is an unresolved issue. Using firm-level data from the Central and Eastern European transition economies, Johnson, McMillan, and Woodruff (2002) demonstrate that property rights security is the single most important factor in determining firms' reinvestment decisions. Cull and Xu (2005) present China as a different case where both property rights protection and access to external finance are important.

In this paper, we use data from China's private enterprises to investigate this issue again. We explicitly address the potential endogeneity issue associated with property rights protection and access to external finance by including an extensive list of control variables and employing the two-step GMM estimation method. We find that only property right protection, not access to external finance, has a positive and statistically significant impact on reinvestment rate, implying that the former is much more important than the latter in shaping firms' profit reinvestment decisions.

Our analysis contributes to the literature in several aspects. Firstly, our research strengthens the conclusion reached by Johnson, McMillan and Woodruff (2002) by addressing the possible endogeneity problem of the survey-based measure of property rights security.

Secondly, our results demonstrate that China does not differ from other transition economies in terms of the relative importance of property rights protection and access to external finance in determining firms' profit reinvestment. It is true that lack of access to formal external finance is a big constraint on business operation and expansion (Asian Development Bank, 2003). Nonetheless, even in China property rights security is a much more significant determinant of profit reinvestment and hence business expansion than does access to external finance (including both formal and informal fi-

nance). Hence, our findings imply that the most serious obstacle to private sector development in China is still the weak property rights protection reflected in illicit and extralegal fees payment etc. Although it is imperative for us to accelerate financial sector reforms to make formal external finance more readily available to private firms, strengthening property rights security is still the central precondition for promoting private sector development. Cleaning up bureaucracy and improving legal protection of private property are therefore badly needed reform measures.

Finally, our study contributes to the debate about the importance of institutions in China's economic growth. Based on mostly cross-country studies, the prevailing literature has established that fundamental economic institutions such as secure property rights are preconditions for firm growth and economic development. However, the case of China's economic growth in the last three decades is often cited as a counterexample to this widely accepted wisdom. China's private enterprises have faced severe expropriations of their private properties. Yet, private enterprises have been the most vibrant sector in driving China's spectacular growth in the past decades. This creates an apparent puzzle that China's private enterprises have achieved remarkable growth in the absence of property rights security. Our study demonstrates forcefully that, similar to other transition economies, property rights security is the most fundamental determinant of firm growth in China. China's private enterprises would have grown even more rapidly if property rights protection were strengthened.

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