A theory of political connections through lender compensation, enforcement, and social objectives on interest rates, access to credit, and investment[1]

Michael O'Connor Keefe
Victoria University of Wellington
School of Economics and Finance
PO Box 600, Wellington 6140, NZ
michael.keefe@vuw.ac.nz
+64 04 463 5708

Current Draft: 13th May, 2016

[1]I thank Victoria University of Wellington for granting and funding my research leave and Willamette University for hosting me. I thank Zonghao Chen, Gary Knight, Hai Lin, and Loc Phuoc Nguyen for their helpful comments. I thank seminar participants at Willamette University and the 2016 New Zealand Finance Colloquium. All remaining errors are my own.

A theory of political connections through lender compensation, enforcement, and social objectives on interest rates, access to credit, and investment

Abstract

I model the effect of political connections through the channels of lender compensation, contract enforcement, and social objectives on financial outcomes such as interest rates, default rates, financial constraints, investment decisions, and the manager's decision about whether to be politically connected or unconnected. The model shows that the effect of political connections on financial outcomes depends upon the relative importance of each channel. By demonstrating the influence of each channel, the model helps explain many contradictory empirical findings about the relationship between political connections and financial outcomes.

Keywords: Political Connection, Lending Decisions, Social Objectives

JEL Classification Codes: G21–Banks, G32–Financing Policy, D72–Economic models of political processes

1 Introduction

The empirical literature about the relationship between political connections and finance is prolific; however, testable hypotheses in this literature tend to be atheoretic.[2] Further, empirical evidence sometimes conflicts and often is specific to an institutional setting. For example, Bliss and Gul (2012a) advance that political connections in Malaysia increase interest rates, Infante and Piazza (2014) suggest that political connections in Italy decrease interest rates, and Khwaja and Mian (2005) find no evidence political connections in Pakistan affect interest rates. Related theory papers do not explain these conflicting empirical results.[3] To better connect theory with the empirical literature, I model the influence of political connections as manifested through lender compensation, contract enforcement, and social objectives on loan interest and default rates, access to credit, investment, and a manager's decision about whether to become politically connected.[4]

To begin, I extend the investment model with stochastic enforcement of Tirole (2006, pages 535-540). In Tirole's model, the lender *ex-ante* adjusts the contract between the lender and borrower to account for the possible lack of enforcement. Due to the *ex-ante* adjustment the interest rate increases (relative to the case with perfect enforcement), but the expected rate of return on the loan is unchanged. Tirole (2006) assumes that the enforcement probability of a contract is an institutional feature of the economy. I follow Tirole in modeling the enforcement probability, but interpret the probability of contract enforcement as borrower specific, so that a loan to a politically connected borrower has an enforcement probability of less than 100%.[5] Thus, in a country like Malaysia, where the loan is subject to possible expropriation by the borrower, the model implies loan interest rates to political connected borrowers are higher, which mirrors the findings of Bliss and Gul (2012a).

[2]For example, Khwaja and Mian (2005), Faccio (2006), Chen, Sun, Tang, and Wu (2011), and Lu, Zhu, and Zhang (2012) reference theory papers, but do not directly motivate hypotheses using theory whereas Li, Meng, Wang, and Zhou (2008), Claessens, Feijen, and Laeven (2008), Firth, Lin, Liu, and Wong (2009), Bliss and Gul (2012a), Bliss and Gul (2012b) are atheoretic.

[3]Krueger (1974) analyzes rent seeking through restraints on trade, Shleifer and Vishny (1993) explore the influence of corruption, Shleifer and Vishny (1994) model bargaining between firms and government, and Kornai, Maskin, and Roland (2003) review the related topic of soft budget constraints.

[4]On a related topic, Stulz (2005) models how country level agency issues related to expropriation lead to concentrated ownership and in so doing explains well documented empirical regularities.

[5]Berkman, Cole, and Fu (2009) find that the probability of expropriation is related to firm characteristics and thus not simply an institutional feature of the country.

An important channel of political influence is through lender compensation. The model shows that political influence through this channel decreases loan interest rates. Taking the channels of contract enforcement and lender compensation together, the model shows that the loan interest rate *increases* with expropriation risk (the probability of contract enforcement decreases), but *decreases* with political influence over lender compensation. Thus, the effects from expropriation risk and political influence over lender compensation counteract each other; implying a plausible negative, positive, or zero net effect of political connections on the interest rate of a loan. For example, in Italy, where the main channel of political connections is through influence over lender compensation, the model implies political connections decrease loan interest rates, which matches the findings of Infante and Piazza (2014). Likewise, in Pakistan political connections influence both contract enforcement and lender compensation. In this case, the model suggests that these two channels may counteract each other, which is consistent with Khwaja and Mian (2005) findings that political connections do not affect loan interest rates. Taken together, the different channels of political connections help explain the contradictory empirical evidence about the relationship between political connections and loan interest rates.

Another channel of political connections is through the possible requirement of the manager to contribute to social objectives (e.g. employ greater than an optimal number of employees) on behalf of the state. However, the diversion of resources to social objectives is costly to the manager. To incentivize the manager, the state provides implicit compensation (e.g. future promotions). Thus, the gain (or loss) to the manager is the difference between the implicit compensation and costs associated with the social objectives. If the difference is positive, the manager always chooses to become politically connected.[6] If the difference is negative, then the manager factors these costs into her decision about whether to become politically connected. Likewise, the model shows why the lender is concerned about political connections. First, a lender understands that a politically connected borrower diverts a portion of the project return to social objectives, which decreases the return available to repay the loan. Second, the cost of social objectives decreases the motivation of the borrower to work hard, which increases the cash required to remain incentive compatible.

[6]In this case, becoming politically connected is a free lunch, so the manager always chooses to be politically connected.

From this perspective the manager might choose to be politically unconnected to loosen credit constraints. Overall, the co-existence of political connected and unconnected borrowers in the same economy can be interpreted as borrowers choosing to be politically unconnected to capture the economic rents of high return projects and potentially loosen credit constraints.

The idea that a manager faces an endogenous choice regarding whether to become politically connected tends to be overlooked in the empirical literature on political connections.[7] Without directly modeling the manager's choice, the literature often reaches apparently contradictory conclusions. For example, Faccio (2006) finds a positive CAR (Cumulative Abnormal Return) due to firm announcements of becoming politically connected. In contrast, Fan, Wong, and Zhang (2007) show that politically unconnected IPO firms in China outperform politically connected IPO firms using a wide variety of three-year measures.[8] However, both studies are consistent with managers making optimal choices and more specifically managers with high return projects choosing to be politically unconnected.

To examine the influence of political connections on investment, I make the investment decision endogenous, which leads to two cases. First, if the manager chooses to be politically unconnected, then clearly political connections do not affect the investment decision. In this case, the manager's objective function does not include the value of political connections, which implies the expected NPV to the manager is equal to the expected NPV of the project. Second, if the manager chooses to be politically connected, she increases investment relative to the politically unconnected case, which leads to over-investment. Essentially, political connections change the manager's objective function so that conditional on choosing to be politically connected the NPV to the manager increases, but the project NPV declines. The model implications are borne out in the empirical literature. For example, Chen et al. (2011) show that non-SOEs (State Owned Enterprises) in China have higher investment efficiency than SOEs. In addition, Wei and Zhu (2015) report that state owned firms (relative to private firms) have lower returns on equity. At an aggregate level, Khwaja and Mian

[7] An exception is Chen et al. (2011), who use a Heckman two-stage method to control for the choice of being politically connected on investment efficiency.

[8] Fan et al. (2007) use post-IPO stock return, earning growth, sales growth, and return on sales.

(2005) estimate investment distortion from political loans at between 0.8-1.6 percent of GDP each year.

The paper proceeds as follows. Section 2 sets up a model of investment with moral hazard, stochastic contract enforcement, politically influenced lender compensation, social objectives that decrease project return, and implicit payments to the borrower for meeting those social objectives. Section 3 derives the influence of political connections on the contract payoffs, loan interest rates, the expected rate of return of the loan, access to finance, and investment levels. Section 4 reviews the model implications relative to the choice of being either politically connected or unconnected. Section 5 provides illustrative examples. Section 6 concludes.

2 Model set-up

To model the influence of political connections on finance, I extend the fixed investment model with stochastic enforcement of Tirole (2006, pp. 535-540). There are two active players in the model: a manager and a lender. Although we refer to the financier as a lender, as noted by Tirole (2006, page 119) the borrowers contract is equivalent to an equity contract. Thus, the implications of the model hold for risky debt or equity. As in Shleifer and Vishny (1994) the manager and the shareholders of the firm are one and the manager serves the interest of the shareholders. Likewise, the lender may be thought of as a loan officer whose objectives are aligned with the bank's objectives. A manager can choose to be either politically connected or unconnected. If the manager chooses to be politically connected, the manager contributes to social projects and in return receives future implicit compensation. In addition, a politically connected manager has influcence over the compensation of the lender, which leads to favorable loan terms. As in Shleifer and Vishny (1994) we require a passive player, the Treasury, who funds both the politically influenced lender compensation and the compensation to the borrower for fulfilling social objectives.

A channel of political influence is through contract enforcement. Khwaja and Mian (2005, p. 1392) write,

> Comparing average default rates for firms that (i) borrow only from government banks, (ii) borrow from both bank types, and (iii) borrow only from private banks, shows that the first have the highest average default rates (25.7 percent), followed by the second (16.9 percent), and then the last category has the lowest default rates (5.4 percent).

In the model the probability of contract enforcement is e where $0 \leq e \leq 1$. Political connections may affect contract enforcement so that $0 \leq e < 1$.

In the model, the manager needs to invest I at $t = 0$ with returns at $t = 1$ of R in the case of success and zero in the case of failure. The manager has an endowment at $t = 0$ of cash A and seeks to borrow $I - A$. Cash is restricted to $0 < A < I$. The risk free rate is assumed to be zero. Both the manager and lender share the same beliefs relative to all exogenous parameters. The borrower and lender are risk neutral. At $t = 0$ the manager chooses whether to work hard or shirk. If she works hard, the probability of project success is p_H. If she shirks, the probability of success drops from p_H to p_L so that $\Delta p = p_H - p_L > 0$. If she shirks she enjoys a private benefit of B where $B > 0$. The manager can not pledge the private benefit B to the lender. There are three future states: success with enforcement, success with expropriation, and failure. For example, if the manager works hard the probability of success with enforcement is ep_H. Also, there is a competitive market for loans so that the lender enters into a contract with zero expected utility, implying a risk neutral lender earns zero NPV in expectation.

Political connections may require the manager to contribute to social objectives. Relative to importance of social objectives in China Chen, Jiang, Ljungqvist, Lu, and Zhou (2015, page 3) write,

> ... the objective function of the Chinese Communist Party (CCP), which ultimately controls most functions of state, is not exclusively the maximization of profits or shareholder value but also the maintenance of a "harmonious society." Consistent with this, we document that the chairmen of state groups in our sample are rewarded with promotions to higher political office not only for raising productivity but also for avoiding large scale job losses. Clearly, these aims can be in conflict (maintaining over-staffing

> may make raising productivity difficult) and over time may be incompatible (subsidizing unproductive jobs may divert resources away from creating productive ones).

In other words, a politically connected borrower may be expected to divert resources to meet social objectives (e.g. firm employment objectives), which reduce the overall return of the project. I define the loss from implementing these social objectives in the case of project success as L where $0 \leq L < R$.[9] In the case of project failure, where the return of the project is zero, the loss due to meeting social objectives is also zero. As a member of a political network, the manager gains future earnings by meeting social objectives where the present value of those future earnings are $S \geq 0$. I further assume, that the borrower can't pledge the present value S of future compensation to the lender.[10]

Lastly, a political connected borrower may influence the future compensation of the lender. I define $C \geq 0$ as the increase in compensation to the lender due to a borrower being politically connected. The mechanics by which a politically connected borrower influences the compensation of a lender is discussed by Khwaja and Mian (2005, p. 1373) who write,

> Politically powerful firms obtain rents from government banks by exercising their political influence on bank employees. The more powerful and successful a politician is, the greater is his ability to influence government banks. This influence stems from the organizational design of government banks that enables politicians to threaten bank officers with transfers and removals, or reward them with appointments and promotions.

I restrict the additional compensation due to political influence to be less than the loan or $0 \leq C < (I - A)$. Due to the competitive market for loans, the lender enters into a contract with a zero expected NPV that includes the compensation due to political connections.[11] If the project is a success and the contract is enforced, the lender receives a payoff of R_l and the borrower R_b where

[9] For the project to have a positive NPV it is necessary that $L < R$.

[10] As in Shleifer and Vishny (1994) S can more generally be thought of a transfer from the Treasury to the manager and could take the form of low cost permits, mining right, regulatory approvals, etc.

[11] The effect of C is to add a payment to the lender that makes the loan budget constraint soft, which implies that rate of return of the loan less than 100%. Over time this leads to the need for bail-outs. See Kornai et al. (2003) for a review of the economic effects of soft budget constraints.

$R_l = R - R_b$. If the project is a success and the contract is not enforced, the borrower expropriates the entire project return R.

Based on the assumptions noted above, Table 1 shows the investments and payoffs associated with the total project, the borrower and the lender. Panel A shows the total, borrower, and lender investments at $t = 0$. Panels B and C show payoffs for the total project, the borrower, and the lender. Panel B assumes the manager works hard and Panel C the manager shirks.

insert Table 1

Using the payoffs from Table 1, I estimate the expected total project NPVs conditional on whether the manager works hard or shirks. If the manager works hard then the expected total project NPV is

$$\begin{aligned} E[NPV|Hard]_{Total} &= ep_H(R - L + S) + (1 - e)p_H(R - L + S) + C - I. \\ &= p_H(R - L + S) + C - I. \end{aligned} \tag{1}$$

Because of the assumption that the borrower can't pledge future earnings S due to political connections to the lender, the expected total NPV including only pledgeable income is

$$E[NPV|Hard, Pledgeable]_{Total} = p_H(R - L) + C - I \geq 0. \tag{2}$$

I assume that if the manager works hard the $E[NPV|Hard, Pledgeable]_{Total} \geq 0$. If the manager shirks, the expected total project NPV is

$$E[NPV|Shirk]_{Total} = p_L(R - L + S) + B + C - I < 0. \tag{3}$$

Eq. (3) insures that the lender must design a contract that incentivizes the borrower to exert high effort.

In the context of the model, what is a politically unconnected borrower? First, a politically unconnected borrower does not influence the compensation of the lender; hence $C = 0$ for a politi-

cally unconnected borrower.[12] Second, the politically unconnected borrower's future compensation is not tied to social obligations and so both $L = 0$ and $S = 0$. Lastly, I assume that a contract for a politically unconnected borrower is strictly enforced so that $e = 1$. By distinguishing between politically connected and unconnected, the model examines the endogenous choice of the manager about whether to be politically connected or unconnected.

3 The influence of political connections on financing

3.1 The loan contract

Using the payoffs from Table 1, I find the expected NPV to the lender when the borrower works hard is

$$E[NPV|Hard]_l = ep_H(R - R_b) + C - (I - A). \tag{4}$$

Using the assumption that the expected profit to the lender is zero, I set Eq. (4) to zero. To find the payoff to borrower, I then rearrange terms to find

$$R_b = R - \frac{(I - A) - C}{ep_H}. \tag{5}$$

Eq. (5) shows the relationship between political connections and the borrower's payoff. First, R_b is independent of both L and S. Intuitively, conditional on sufficent return R the lender is indifferent to the size of either L or S. To understand the influence of the other political connection parameters on the borrower's payoff, I take the derivative of Eq. (5) with respect to e and C to find

$$\frac{\partial R_b}{\partial e} = \frac{1}{e^2 p_H}\left[(I - A) - C\right] > 0, \tag{6}$$

$$\frac{\partial R_b}{\partial C} = \frac{1}{ep_H} > 0. \tag{7}$$

[12] As noted by Lu et al. (2012) an alternative mechanism to gain influence is through an ownership stake of over 5% in the bank. This ownership stake likely leads to a seat on the board of directors and better lending terms.

Eq. (6) shows that as the enforcement probability e increases, the payment to the borrower in the case of success R_b increases. Eq. (7) shows that if the political influence over the compensation to the lender C increases, then the payment to the borrower in the case of success with enforcement R_b also increases.

To find the payoff to the lender, I substitute $R_l = R - R_b$ into Eq. (4), set the equation to zero, and rearrange to find

$$R_l = \frac{(I - A) - C}{ep_H}. \tag{8}$$

Eq. (8) shows the relationship between political connections and the lender's payoff. As with the borrower's payoff, the lender's payoff is independent of both L and S. To understand the influence of political connections on the lender's payoff, I take the derivative of Eq. (8) with respect to e and C to find

$$\frac{\partial R_l}{\partial e} = \frac{C - (I - A)}{e^2 p_H} < 0, \tag{9}$$

$$\frac{\partial R_l}{\partial C} = \frac{-1}{ep_H} < 0. \tag{10}$$

As expected, the signs on the derivatives are opposite to the signs for the borrower's payoff. Specifically, Eq. (9) shows that as enforcement e increases (decreases) the payment to the lender in the case of success with enforcement decreases (increases). In response to a decrease in contract enforcement (i.e. $e \downarrow$), the lender *ex-ante* increases R_l due to an increased probability of expropriation $(1 - e)$. Lastly, Eq. (10) shows C is a substitute for project return so an increase in C implies a decrease in R_l.

3.2 Loan interest rate

Do political connections influence the interest rate of a loan? The contractual payment to the lender in the case of success with enforcement is R_l and the loan amount is $I - A$, which implies an interest rate of $i = \frac{R_l}{(I-A)} - 1$. In Appendix A.1, I solve for i to find

$$i = \frac{1}{ep_H}\left(1 - \frac{C}{I - A}\right) - 1. \tag{11}$$

Because I assume both risk neutrality and the risk free rate of interest equals zero, i represents the rate of interest that exactly compensates the lender for the probability a state evenutuates where the lender is not paid.

Eq. (11) shows the interest rate is unaffected by either L or S. To understand the influence of political connections on interest rates, I take the derivative of Eq. (11) with respect to e and C to find

$$\frac{\partial i}{\partial e} = \frac{-1}{e^2 p_H}\left(1 - \frac{C}{I-A}\right) < 0, \tag{12}$$

$$\frac{\partial i}{\partial C} = \frac{-1}{e p_H}\left(\frac{1}{I-A}\right) < 0. \tag{13}$$

Eq. (12) shows that as the enforcement probability e increases the rate of interest i decreases.[13] Eq. (13) shows that an increase in the lender's compensation C, results in a decrease in the rate of interest i. Thus, an increase in political influence, which is manifested through loan enforcement and lender compensation, both positively (through decreased enforcement) and negatively (through lender compensation) affects the rate of interest on the loan.

To see this more clearly, suppose a politically unconnected borrower is subject to full enforcement $e = 1$ and can't influence the compensation of the lender $C = 0$. Thus, the condition where a politically connected borrower has a higher rate of interest i^p than the non-politically connected borrower i^n is

$$i^p > i^n$$

$$\frac{1}{e p_H}\left(1 - \frac{C}{I-A}\right) - 1 > \frac{1}{p_H} - 1,$$

which I simplify to

$$e < 1 - \frac{C}{I-A}. \tag{14}$$

[13] Note this relationship holds due to the restriction $C < (I - A)$.

Eq. (14) shows that a politically connected borrower (relative to a non-politically connected borrower) pays a higher interest rate when the enforcement probability e is low relative to the political influence of compensation scaled by the loan $\frac{C}{I-A}$.

Eq. (14) helps explain the contradictory evidence on the relationship between political connections and loan interest rates. In Malaysian the main channel of political connections is through lack of contract enforcement, which is consistent with Bliss and Gul (2012a) findings that political connections increase loan interest rates. In Italy the main channel of political connections is through influence over lenders, which is consistent with Infante and Piazza (2014) findings that political connections in Italy decrease loan interest rates. Lastly, in Pakistan political connections influence both enforcement and lender compensation, which is consistent with Khwaja and Mian (2005) findings that political connections do not affect loan interest rates. In a related paper, Lu et al. (2012) find private firms obtain lower interest rates by obtaining board seats on banks in China.[14]

3.3 Expected rate of return of the loan

Do political connections influence the expected rate of return of the loan? To distinguish between the return R, I define the expected rate of return as $E[r]$. To match the model to the empirical literature, I follow Khwaja and Mian (2005) and in Appendix A.2 derive the expected rate of return of the loan as

$$E[r] = 1 - \frac{C}{I-A}. \tag{15}$$

The expected return definition of Khwaja and Mian (2005) accounts for default, interest, and recovery rates so that a loan with an expected return of 100% brings in the original loan amount adjusted for interest rates, possible default, and recovery.[15] In Appendix A.2, I also derive Eq. (15) in an alternative manner by taking the expected return to the lender divided by the loan.

[14] Although the connection by private firms through board membership is not a political connection, the channel of influence is through shareholder power over bank managers, which is consistent with the model.

[15] Note that Eq (15) defines the expected return of the loan and not the expected return of the lender, which is always equal to one. To see this, note that the lender's rate of return from the politically influenced lender compensation is $\frac{C}{I-A}$.

Eq. (15) provides insight into the relationship between political connections and the expected rate of return of the loan. First, the expected rate of return $E[r]$ is independent of both e, L, and S. This is because *ex-ante* the lender writes a contract that accounts for possible expropriation. In addition, due to the zero NPV assumption the division of the surplus (ie. relative magnitudes of L and S) is not relevant to the lender's payoff. Second, when $C = 0$ the expected rate of return is equal to one, which is consistent with risk neutrality. Also, when the lender's compensation C is influenced by political connections, the expected rate of return on the loan is less than one and further $E[r]$ drops linearly based upon the ratio $\frac{C}{(I-A)}$. In other words, the higher the compensation C relative to the loan amount $(I - A)$ the lower the expected rate of return. Lastly, when $C > 0$ the negative expected rate of return equivalently implies a loan recovery rate that is less than the loan amount, which matches the empirical findings of Khwaja and Mian (2005).

3.4 Access to finance

The conditions for the borrower to have access to finance are: i) the project has sufficient pledgeable return to generate an expected positive NPV, ii) there must be sufficient return in the success with enforcement state to fund R_l, and iii) the manager must possess sufficient cash A to be incentive compatible. To clearly define the first condition, I re-arrange Eq. (2)

$$R \geq \frac{I - C}{p_H} + L = \bar{R}_1, \tag{16}$$

where $\bar{R_1}$ represents the minimum project return to receive financing. If $R < \bar{R}_1$ the borrower is unable to obtain financing. In this case, the lender will not participate due to a lack of project return.

To meet the second condition the borrower's project must have sufficient return in the case of success with enforcement to meet the claim R_l. For example, in the extreme case of zero enforcement there would not be return available for the lender to receive R_l. In Appendix A.3, I show the lender requires the borrower to have access to a project with return $R > \bar{R_2}$ where

$$R \geq \frac{(I - A) - C}{ep_H} + L = \bar{R}_2, \tag{17}$$

If $R < \bar{R}_2$ the borrower is unable to obtain financing. In this case, the lender will not participate due to a lack of project return in the success with enforcement state.

Third, the contract must be incentive compatable to the borrower so that $E[NPV|Hard]_b \geq E[NPV|Shirk]_b$. In Appendix A.4, I show that this incentive compatability constraint implies the lender requires the borrower to hold cash $A > \bar{A}$ where

$$A \geq I - p_H \left[R - \frac{B}{\Delta p} - L + S \right] - C = \bar{A}. \tag{18}$$

If $A < \bar{A}$ the borrower (even with a postive NPV project)can not obtain financing and is credit rationed.

In summary, for a borrower to obtain funding, she must have sufficient return so that $R \geq \bar{R}_1$ and $R \geq \bar{R}_2$ and sufficient cash so that $A \geq \bar{A}$ as defined in Eqs. (16), (17), and (18), respectively. Both Eqs. (16) and (17) must hold to satisfy the participation (individual rationality) constraint of the lender. Eq. (18) must hold for the borrower to be incentive compatible. To understand the influence of political connections on access to finance, I evaluate each expression with respect to the parameters e, L, S, and C.

What is the influence of the enforcement probability e on obtaining financing? First, the enforcement probability does not influence the minimum cash required or the return required for a positive NPV.[16] However, a lower enforcement probability implies the project must have a higher return due to the potential expropriation in the success but not enforce state. To clarify the relationship, I take the derivative of $\bar{R}_2$ with respect to e to find

$$\frac{\partial \bar{R}_2}{\partial e} = \frac{-1}{e^2 p_H} \left[(I - A) - C \right] < 0, \tag{19}$$

which shows that the return required decreases (increases) with the enforcement (expropriation) probability.

What is the influence of the social objectives on financing? Because the borrower can not pledge to lender the present value of future earnings from meeting social objectives, the return required to

[16] Note that $\frac{\partial \bar{R}_1}{\partial e} = 0$ and $\frac{\partial \bar{A}}{\partial e} = 0$.

obtain financing is not affected by S.[17] However, compensation due to meeting social objectives S increases the incentive of the borrower to work hard. To show this relationship, I take the derivative of $\bar{A}$ with respect to S to find

$$\frac{\partial \bar{A}}{\partial S} = -p_H < 0, \tag{20}$$

which shows that increasing S implies a decrease in the cash required to secure financing.

In contrast, higher spending L on social objectives tighten financial constraints in all three dimensions. To more clearly see this relationship, I take derivatives of Eqs. (16), (17), and (18) with respect to L to find

$$\frac{\partial \bar{R}_1}{\partial L} = 1 > 0, \tag{21}$$

$$\frac{\partial \bar{R}_2}{\partial L} = 1 > 0, \tag{22}$$

$$\frac{\partial \bar{A}}{\partial L} = p_H > 0. \tag{23}$$

The signs of the derivatives show that an increase in L tightens financial constraints both in terms of the minimum returns and minimum cash required to obtain financing.

What is the effect of political influence on the compensation C of the lender on access to finance? To clarify the relationship, I take derivatives of Eqs. (16), (17), and (18) with respect to C to find

$$\frac{\partial \bar{R}_1}{\partial C} = \frac{-1}{p_H} < 0, \tag{24}$$

$$\frac{\partial \bar{R}_2}{\partial C} = \frac{-1}{ep_H} < 0, \tag{25}$$

$$\frac{\partial \bar{A}}{\partial C} = -1 < 0. \tag{26}$$

The signs of the derivatives show that an increase in C loosens financial constraints both in terms of the minimum returns and minimum cash required to obtain financing.

The model provides insight into the effect of political influence on access to finance. First, a decrease in enforcement probability increases the minimum return R required to obtain financing.

[17] Note that $\frac{\partial \bar{R}_1}{\partial S} = 0$ and $\frac{\partial \bar{R}_2}{\partial S} = 0$.

Second, an increase in the loss L due to meeting social objectives both increases the minimum return R and the minimum cash A required to obtain financing. Thus, at the margin a decrease in e and an increase in L both tighten access to finance. In contrast, an increase in political influence over the compensation C of the lender decreases the minimum cash A and return R required to obtain financing. Overall, the influence of political connections on access to finance is dependent on relative magnitudes of e, S, L, and C.

3.5 Endogenous investment

Up to this point in the paper, I assume an investment I is fixed and unaffected by political influence. To understand the implications of political connections on investment, I follow Keefe and Kieschnick (2014) and add decreasing returns to scale to the continuous investment model of Tirole (2006). This extension makes investment endogenous where at $t = 0$ a manager invests $I \in \mathbb{R}^+$ in a project. At $t = 1$, the project generates cash flow of RI^α in the case of success and zero in the case of failure. I let $0 < \alpha < 1$, which generates decreasing returns to scale to the investment I, implying an optimal level of investment .[18] In addition, I assume the magnitudes of L, S, and C are proportional to I so that

$$E[NPV|Hard]_{Total} = p_H(RI^\alpha - LI + SI) + CI - I \tag{27}$$

Appendix A.5 shows the level of investment I^* that maximizes Eq. (27) is

$$I^* = \left(\frac{\alpha p_H R}{1 + p_H(L - S) - C}\right)^{\frac{1}{1-\alpha}}. \tag{28}$$

[18]For the sake of brevity I assume the borrower enters into an incentive compatible contract with the lender and the participation constraints of both the lender and borrower are satisfied. For more information about the contracts in the case of decreasing returns to scale see Keefe and Kieschnick (2014)

To understand the relationship between I^* and political connections, I take the derivatives with respect to the political connection parameter to find

$$\frac{\partial I^*}{\partial C} = \frac{A^{\frac{\alpha}{1-\alpha}}}{1-\alpha} > 0, \tag{29}$$

$$\frac{\partial I^*}{\partial L} = \frac{-A^{\frac{\alpha}{1-\alpha}}}{1-\alpha} < 0, \text{ and} \tag{30}$$

$$\frac{\partial I^*}{\partial S} = \frac{A^{\frac{\alpha}{1-\alpha}}}{1-\alpha} > 0, \tag{31}$$

where $A = \frac{\alpha p_H R}{[1+p_H(L-S)-C]^2}$. Eq. (29) through Eq. (31) show investment increases with lender compensation C, decreases due to losses from social obligations L, and increases due to implicit compensation from fulfilling social obligations S, respectively. Thus, the effect of political connections on investment levels appears ambiguous; however, as shown in Section 4.3 once I model the manager‘s choice about whether to become politically connected, political connections unambiguously lead to overinvestment.

4 Why choose to be politically unconnected?

In practice, we observe networks of politically connected and unconnected borrowers.[19] To explain why there is heterogeneity in political connections, one might argue that heterogeneity is due to the impossibility of everyone being politically connected.[20] On the other hand, social network theory suggests that if belonging to a network is optimal, then everyone eventually joins the network.[21] To evaluate if heterogeneity is the result of each manager pursuing an optimal strategy, I evaluate the conditions when a manager chooses to become politically connected or unconnected.

[19] In the Khwaja and Mian (2005) sample, 77%(63%) of the firms(lending) are politically unconnected and Fan et al. (2007) finds that 27% of CEO's in new IPO firms in China are politically connected.

[20] For example, Li et al. (2008) reviews the hurdles required to gain entry into the Chinese Communist Party.

[21] For an overview of how information diffusion may result in the adoption of a common behavior see Easley and Kleinberg (2010, Chap. 19).

4.1 Higher expected NPV

Under what conditions, would a borrower choose to be politically unconnected to obtain a higher expected project NPV? Because the borrower earns all the economic rents the expected NPV to the borrower is equal to the total project NPV.[22] The expected NPV to the politically connected borrower is $E[NPV|Hard]^p = p_H(R - L + S) + C - I$ and to the politically unconnected borrower is $E[NPV|Hard]^n = p_H R - I$. Thus, a borrower chooses to be politically unconnected when

$$\begin{aligned} E[NPV|Hard]_b^n &\geq E[NPV|Hard]_b^p, \\ p_H R - I &\geq p_H(R - L + S) + C - I, \\ p_H &\geq \frac{C}{L - S}, \end{aligned} \tag{32}$$

which holds for $L > S$.[23] Eq. (32) shows that a borrower chooses to be politically unconnected when the probability of success is high relative to the ratio $\frac{C}{L-S}$. In the extreme case, when political influence over lender compensation is so high that $C > (L - S)$ the borrower always chooses to be politically connected.[24] Likewise, for $C < (L - S)$, a relatively high C implies a borrower may choose to be politically connected for even a high p_H. In contrast, for a very low C a borrower may choose to be politically unconnected even for a relatively low p_H. Likewise, as $L - S$ increases a borrower may choose to be politically unconnected even for a relatively low p_H. Importantly, except in the cases where $C > (L - S)$ and $L < S$ the model shows why we observe in most economies both politically connected and unconnected borrowers.

4.2 Access to finance

Might a borrower choose to be politically unconnected to gain greater access to finance? More specifically, under what conditions does a politically unconnected borrower need either less project return or cash to obtain financing? The conditions where a politically unconnected borrower has lower financial constraints are $\bar{R}_1^n < \bar{R}_1^p$, $\bar{R}_2^n < \bar{R}_2^p$, and $\bar{A}^n < \bar{A}^p$. In Appendix A.7, I substitute

[22] See Appendix A.6 for a derivation.

[23] If $L < S$ then Eq. (32) changes to $p_H \leq \frac{C}{L-S}$<0. but $p_H > 0$, which implies the manager always chooses to be politically connected.

[24] Note that $0 < p_H < 1 < \frac{C}{L-S}$ for $C > (L - S)$.

the relevant expression into each condition to find

$$p_H L > C, \tag{33}$$

$$e p_H L + (1-e)(I-A) > C, \tag{34}$$

$$p_H (L - S) > C. \tag{35}$$

When Eqs. (33) and (34) hold, a politically unconnected borrower requires less return than a politically connected borrower to obtain financing. Likewise, when Eq. (35) holds, a politically unconnected borrower requires less cash than a politically connected borrower to obtain financing. In the case where the channel of political connection is strictly through lender compensation (i.e. $e = 1$ and $L = S = 0$), then Eqs. (33) through (35) never hold and political connections unambiguously improve access to finance. For example, Lu et al. (2012) finds private firms with board seats on banks hold less cash and are able to quickly access short term debt in downturns. However, when political influence is through the channels of both loan enforcement and social objectives, the effect of political connections on credit constraints is ambiguous and depends upon on the relative magnitudes of social objectives versus lender compensation. which I discuss below.

Eq. (33), which holds when $\bar{R}_1^n < \bar{R}_1^p$, shows that a politically unconnected borrower (relative to a politically connected borrower) needs access to a project with a lower return to obtain financing when the expected loss from social objectives $p_H L$ is greater than the compensation to the lender C. Alternatively, a politically connected borrower has easier access to finance when the compensation to the lender C is greater than the expected loss due to social objectives.

Eq. (34), which holds when $\bar{R}_2^n < \bar{R}_2^p$, requires that the sum of the two LHS terms is greater than C. The first term $e p_H L$ represents the expected in return due to social objectives in the success with enforcement state. The second term $(1-e)(I-A)$ represents the expected value of the expropriation of the loan. When the sum of these effects are greater than C a politically unconnected borrower (relative to a politically connected borrower) requires a lower return R to obtain financing.

Lastly, Eq. (35), which holds when $\bar{A}^n < \bar{A}^p$, shows that a politically unconnected borrower (relative to a politically connected borrower) needs less cash to obtain financing when the expected loss from social objectives $p_H L$ minus the expected gain from social objectives $p_H S$ is greater than the compensation to the lender C. This condition is important for two reasons. First, it is exactly the same condition as in Eq. (32), which specifies the condition where a borrower chooses to be politically unconnected. Second, if if Eq. (35) holds, then Eq. (33) automatically holds.[25]

Thus, the model shows that a borrower with a relatively high probability of success may choose to be politically unconnected either to fully capture the return of the project or secure financing. Because the model assumes symmetric information, the borrower is able to secure her preferred contract without a costly signal. The symmetric assumption is based on the idea the lender can observe if the borrower is (or is not) politically connected and also there is no difference in the quality of the borrower.[26]

4.3 Investment implications

Eq. (28) in Section 3.5 shows the optimal investment of a politically connected firm facing a decreasing returns to scale project is $I^{*p} = \left(\frac{\alpha p_H R}{1+p_H(L-S)-C}\right)^{\frac{1}{1-\alpha}}$. Thus, the optimal investment for a politically unconnected firm (i.e. L=S=C=0) is $I^{*n} = (\alpha p_H R)^{\frac{1}{1-\alpha}}$. I show in Appendix A.8 that a politically unconnected firm invests more ($I^{*n} > I^{*p}$) when $p_H > \frac{C}{L-S}$. Likewise, in Appendix A.9, I show that a manager chooses to be politically unconnected when $p_H > \frac{C}{L-S}$.[27]

Because the same condition $p_H > \frac{C}{L-S}$ determines both the investment size and the decision to become politically connected, there are two cases. In the first case $p_H > \frac{C}{L-S}$, implying the manager chooses to be politically unconnected and invests more relative to the counter-factual case where she chooses to be politically connected. In the second case $p_H < \frac{C}{L-S}$, implying the manager chooses to be politically connected and invests more than in the counter-factual case where she chooses to be

[25] If $p_H(L-S) > C$ then $p_H L > C + p_H S$, which implies $p_H L > C$ for $S > 0$.

[26] Specifically, the paper doesn't model a borrower using political connections to signal her type. Li et al. (2008) discuss how membership in the Chinese Communist Paper may signal quality. Also, Chen, Liu, and Su (2013) suggest that better performing (good type borrowers) separate from poorer performing (bad type borrowers) by entertaining bankers.

[27] The condition is identical to Eq. (32) in the fixed investment model.

politically unconnected. Because I^{*n} maximizes the project NPV, a politically connected manager over-invests, leading to lower expected returns on investment on loans to politically connected firms.

The model implies that managers, who choose to become politically connected, over-invest and are less financially constrained. These two implications jointly imply that politically connected firms have lower investment returns and hold more debt. Both implications are supported by Khwaja and Mian (2005), Claessens et al. (2008) and Chen et al. (2011). At the aggregate level, the model implications are consistent with La Porta, Lopez-de-Silanes, and Shleifer (2002), who find lower aggregate growth and productivity in countries with higher government ownership of banks.[28]

5 Illustrative Examples

5.1 Fixed investment example

To provide intuition regarding the effect of political connection parameters e, S, L, and C on lending terms, Table 2 shows different scenarios in Columns (1) through (6). A common set of assumptions is used for all scenarios. The borrower has access to a project with a return of $R = \$125$ in the case of success and zero in the case of failure. The project requires an investment of $I = \$100$. The borrower holds cash of $A = \$30$ and thus requires a loan of $I - A = \$70$. If the borrower works hard the probability of success is $p_H = 87\%$. If the borrower shirks, the probability of success declines to $p_L = 60\%$, but she gains a private benefit of $B = \$12$. Panel A shows various scenarios with different values of e, S, L, and C. Panel B provides model outputs for each scenario. Panel C shows the minimum return and cash required to obtain financing.

insert Table 2

The first scenario in Column (1) establishes a politically unconnected base case. Column (1) in Panel A shows the political connection parameters are $e = 100\%$, $S = \$0$, $L = \$0$, and $C = \$0$. Panel B shows the total project expected NPV is \$8.75 if the borrower works hard and -\$13 if

[28] The empirical literature finds government banks are subject to political influence. Dinc (2005) finds that government banks increase lending during election years and Khwaja and Mian (2005) find that politicians exert influence exclusively through state banks and not private banks.

the borrower shirks. Thus, the lender needs to design a contract that incentivizes the borrower to work hard. Panel C shows that the minimum cash required for the borrower to remain incentive compatible is \$29.92, which is slightly less than the cash held of \$30. Consistent with the borrower holding sufficient cash to be incentive compatable, the expected NPV of working hard is \$8.75 versus the expected NPV of shirking is \$8.72.[29] The lender charges an interest rate of 14.94%, which results in an expected rate of return from the loan of 100%. Because contracts are fully enforced, the expected default rate is 13% or $1 - p_H$. This first scenario illustrates the fixed investment model of Tirole (2006, pages 115-119).

In the second scenario, the enforcement probability changes from $e = 100\%$ in Column (1) to $e = 95\%$ in Column (2). The other political connection parameters are unchanged. The decrease in enforcement probability increases the expected default rate from 13% to 17.35%. The lender recognizes the increase in the default rate and *ex-ante* adjusts the contract. Thus, the payment to the lender in the case of success increases from \$80.46 to \$84.69. Likewise, the interest rate increases from 14.94% to 20.99%. Due to the *ex-ante* adjustment the rate of return of the loan remains at 100%. This second scenario illustrates the fixed investment model with stochastic contract enforcement of Tirole (2006, pages 535-540). Importantly, the decrease in enforcement probability results in an increased interest rate, but a constant expected rate of return. In contrast, Khwaja and Mian (2005) find loans to politically connected borrowers (relative to unconnected) have similar interest rates but lower rates of returns.

The third scenario in Column (3) changes politically influenced lender compensation from $C =$ \$0 to $C =$ \$3.5. Column (3) in Panel A shows the political connection parameters are $e = 95\%$, $S =$ \$0, $L =$ \$0, and $C =$ \$3.5. As shown in Eqs. (9) and (10), an increase in lender compensation C has the opposite effect of a decrease in the enforcement probability. Column (3) shows how politically influenced lender compensation counteracts decreased enforcement in the loan terms. Specifically, the loan interest rate in Columns (1) and (3) are identical, which matches what is empirically observed by Khwaja and Mian (2005). In addition, the politically connected lender

[29] Note the expected total project NPV and the borrower's expected NPV when working hard are equal.

compensation results in a 95% rate of return with a default rate of 17.35%.[30] Lastly, in every case the minimum return and cash required to obtain financing in Column (3) of Panel C is less than in Column (2). Likewise, the borrower requires less cash as the minimum cash decreases from \$29.92 in Column (2) to \$26.42 in Column (3), which shows that politically influenced lender compensation increases access to finance.

The fourth scenario in Column (4) shows the effect of social objectives on financing. Columns (1) through (3) set $S = \$0$ and $L = \$0$. Column (4) sets $S = \$5$ and $L = \$6$. The requirement for the borrower to fulfill social objectives reduces the expected NPV of the borrower from \$12.25 in Column (3) to \$11.38 in Column (4). Social objectives also affect access to finance. Relative to Column (3) in Panel C, the required minimum return and cash holdings all increase due to social objectives. Eq. (32) shows that a borrower chooses to be politically unconnected when $p_H > \frac{C}{L-S}$. Clearly, this condition does not hold in this example. Thus, the borrower chooses to be politically connected and earn the expected NPV of \$11.38 in Column (4), rather than to be politically unconnected and earn the expected NPV of \$8.75 in Column (1). All in all, the benefits of politically connected lender compensation outweigh the cost of social objectives and the borrower chooses to be politically connected.

In the fifth scenario in Column (5), I markedly increase the loss L from \$6 to \$12. Relative to Column (4), the minimum returns $\bar{R}_1$ and $\bar{R}_2$ and the minimum cash $\bar{A}_1$ all increase. Importantly, in Column (5) $\bar{A}_1$ is equal to \$32.51, which exceeds the \$30.00 cash holdings of the borrower. As a result, the borrower is credit rationed. Also, even if the borrower had access to finance, because Eq.(32) holds; she chooses to be politically unconnected with expected NPV of \$8.75 as shown in Column (1) rather than to be politically connected with an expected NPV of \$6.16 as shown in Column (5).[31]

The sixth scenario in Column (6) decreases the loss L back from \$12 to \$6 and lowers the enforcement probability from 95% to 60%. Column (6) in Panel A shows the political connection parameters are $e = 60\%$, $S = \$5$, $L = \$6$, and $C = \$3.5$. This scenario illustrates two points.

[30] In the Khwaja and Mian (2005) sample, the mean interest, return, and default rates are 14.05%, 93.46%, and 17.61%, respectively.

[31] Note that in Column (5) the contract would not be offered as the borrower would choose to shirk.

First, the expected NPV of the project is \$11.38, which matches the NPV in Column (4) and satisfies the participation constraint of the borrower. Second, the lower enforcement probability increases $\bar{R}_2$ from \$92.46 in Column (5) to \$133.39 in Column (6). Because $R < \bar{R}_2$, the borrower is credit rationed. In this scenario, despite the lower expected NPV associated with being politically unconnected in Column (1), the borrower chooses to be politically unconnected to gain access to finance.

5.2 Continuous investment example

To provide intuition regarding the effect of political connection parameters e, S, L, and C on investment, Table 2 depicts three scenarios in Columns (1) through (3). For the three scenarios, a borrower has an investment opportunity of I with a return of RI^{α} in the case of success and zero in the case of failure. The probability of success conditional on the borrower working hard is $p_H = 87\%$, the return to scale parameter is $\alpha = 0.75$, and the proportional return is $R = 5$. Panel A shows various scenarios using different values of e, S, L, and C. Panel B provides model outputs for each scenario. Columns (1) and (3) of Panel B illustrate the expected outcomes of a politically connected borrower, whereas Column (2) of Panel B depicts the expected outcomes of a politically unconnected borrower.

insert Table 3

The first scenario in Column (1) establishes a base case where $e = 95\%$, $S = \$2$, $L = \$3.3$, and $C = \$1$, which implies an expected NPV to the borrower of 26.10 and an expected NPV from the project of 35.17. In Column (1) $p_H > \frac{C}{L-S}$, which satisfies the condition where the borrower chooses to be politically unconnected. Column (2) sets $e = 1$ and $S = L = C = 0$, which represents a managers choice to be politically unconnected. Columns (1) versus (2) in Panel B show the manager can increase the expected NPV from 26.10 to 37.76 by choosing to be politically unconnected. Importantly, in Column (2) the manager increases the investment from 69.24 to 113.29, which increase the expected project NPV from 35.17 to 37.76. Column (1) represents a counter-factual, as a manager always chooses to move from Column (1) to Column (2).

In Column (3) the social loss L decreases from $L = 3.3$ in Column (1) to $L = 3$ in Column (3). The decrease in L increases the attractiveness of being politically connected. More specifically, in Column (3) $p_H < \frac{C}{L-S} = 1$, which implies the borrower chooses to be politically connected. When moving from Column (2) to (3), the manager increases investment from 113.29 to 197.75, which illustrates how political connections incentivize the manager to over-invest. The manager's NPV increases from 37.76 in Column (2) to 57.35 in Column (3); however the project NPV declines from 37.76 in Column (2) to 31.64 in Column (3). All in all, Column (3) shows that when a manager extracts political rents investment increases, the expected NPV to the manager increases, and the expected project NPV declines.

6 Conclusion

The empirical literature reaches several apparently contradictory conclusions about the relationship between political connections and financial outcomes. To help explain the reasons behind these disparate empirical findings, I extend the fixed investment model with stochastic contract enforcement of Tirole (2006, pages 535-540) by adding the channels of lender compensation and social projects. Overall, the model shows the relative importance of each channel helps explain these disparate financial outcomes.

The model provides reasons for why the relationship between political connections and loan interest rates appears ambiguous. Specifically, the relative magnitudes of contract enforcement versus lender compensation imply different loan interest rate outcomes. For example, political influence through the channel of contract expropriation helps explain Bliss and Gul (2012a) findings that political connections in Malaysia increase interest rates; political influence through the channel of lender compensation helps explain Infante and Piazza (2014) findings that political connections in Italy decrease interest rates, and political connections through the channels of both lender compensation and expropriation helps explain Khwaja and Mian (2005) finding no evidence political connections in Pakistan affect interest rates.

The model also advances the importance of the manager‘s decision regarding the choice to become politically connected. Most empirical papers ignore this choice and treat politically connec-

tions as exogenous. Consistent with firms choosing to be politically connected to increase firm value, Faccio (2006) finds a positive CAR (Cumulative Abnormal Return) due to firm announcements of becoming politically connected. In contrast, Fan et al. (2007) show that politically unconnected IPO firms in China outperform politically connected IPO firms using a wide variety of three-year measures. Both apparently contradictory outcomes are consistent with managers making value maximizing choices about political connections.

By treating the investment decision as endogenous, I show political connections naturally lead to overinvestment (relative to the politically unconnected case) and thus lower project returns. First, the manager evaluates which option (politically connected or unconnected) leads to the highest expected NPV. Conditional on choosing to be politically connected, the manager chooses a level of investment that includes the benefits of the political connection, which leads to overinvestment. Thus, the return (exclusive of political transfers) on investment declines relative to the politically unconnected case. The empirical literature supports the negative relationship between political connections and returns(Khwaja and Mian, 2005, Chen et al., 2011, Wei and Zhu, 2015). Also, Allen, Qian, and Qian (2005) show that firms in the private sector dominate firms in the state owned and listed sectors in terms of economic growth. Overall, the model shows how political connections change the investment function of the manager.

In closing, the model's insight that managers might choose to be politically unconnected to improve access to finance appears to be at odds with the *firm level* empirical literature. For example, Firth et al. (2009) find that in addition to measures of credit worthiness, political connections in China assist a borrower in gaining access to finance; Lu et al. (2012) asserts that non-state owned firms in China hold relatively large stakes in commercial banks as a substitute for political connections; and Claessens et al. (2008) find that Brazilian firms make campaign contributions to improve access to finance. However, at the *country level* La Porta et al. (2002) find that government ownership of banks slows financial development. In other words, access to finance improves in a financial system that is less influenced by political connections. Taken together, the empirical evidences suggests political connections aid a firm in securing financing, but at an aggregate level

political connections slow financial development. Resolving this apparent conflict between the firm and aggregate level findings represents an interesting question for future research.

A Appendix

A.1 Derivation of Eq. (11)

I substitute R_l as defined in Eq. (8) into the expression below and simplify to find

$$\begin{aligned} i &= \frac{R_l}{(I-A)} - 1 \\ &= \left(\frac{1}{I-A}\right) R_l - 1 \\ &= \left(\frac{1}{I-A}\right)\left(\frac{(I-A)-C}{ep_H}\right) - 1, \\ &= \frac{1}{ep_H}\left(1 - \frac{C}{I-A}\right) - 1. \end{aligned}$$

A.2 Derivation of Eq. (15)

I follow Khwaja and Mian (2005), who define the expected rate of the return of the loan as

$$E[r] = (1-d)(1+i) + dc, \tag{36}$$

where d is the default rate and c the recovery rate. The model default rate d is

$$\begin{aligned} d &= (1-e)p_H + (1-p_H), \\ d &= 1 - ep_H. \end{aligned} \tag{37}$$

The model recovery rate is $c = 0$. I substitute $c = 0$, Eq. (37) and Eq. (11) into Eq. (36) to find

$$\begin{aligned} E[r] &= (1 - 1 + ep_H)\left[1 + \frac{1}{ep_H}\left(1 - \frac{C}{I-A}\right) - 1\right], \\ &= 1 - \frac{C}{I-A}, \end{aligned} \tag{38}$$

which equals the expected return of the loan.

Also, the expected return definition of Khwaja and Mian (2005) is equivalent to the expected return from the loan divided the loan. I substitute R_l as defined in Eq. (8) into the expected return

from the loan divided by the loan and simplify to find

$$\begin{aligned} E[r] &= \frac{ep_H R_l + (1-e)p_H 0 + p_L 0}{(I-A)}, \\ &= \frac{ep_H R_l}{(I-A)}, \\ &= \frac{ep_H \left(\frac{(I-A)-C}{ep_H}\right)}{(I-A)}, \\ &= 1 - \frac{C}{(I-A)}, \end{aligned}$$

which matches Eq. (38).

A.3 Derivation of Eq. (17)

Based on the zero profit condition to the lender,

$$ep_H R_l = (I-A) - C. \tag{39}$$

Also, for there to be sufficient total project return to pay R_l

$$\begin{aligned} R - L &\geq R_l \\ ep_H(R-L) &\geq ep_H R_l \end{aligned} \tag{40}$$

I subsitute the RHS of Eq. (39) into the RHS of Eq. (40) and simplify to find

$$\begin{aligned} ep_H(R-L) &\geq (I-A) - C, \\ R - L &\geq \frac{(I-A)-C}{ep_H}, \\ R &\geq \frac{(I-A)-C}{ep_H} + L = \bar{R}_2, \end{aligned} \tag{41}$$

where $\bar{R}_2$ represents the minimum return required for the borrower to obtain funding.

A.4 Derivation of Eq. (18)

The lender designs a contract so that

$$E[NPV|Hard]_b \geq E[NPV|Shirk]_b,$$

$$p_H\left[e(R_b - L + S) + (1-e)(R - L + S)\right] - A \geq p_L\left[e(R_b - L + S) + (1-e)(R - L + S),\right] + B - A$$

$$p_H\left[eR_b + (1-e)R - L + S\right] \geq p_L\left[eR_b + (1-e)R - L + S\right] + B,$$

$$\Delta p\left[eR_b + (1-e)R - L + S\right] \geq B$$

$$eR_b + (1-e)R - L + S \geq \frac{B}{\Delta p}. \tag{42}$$

I substitute the contract to the borrower $R_b = R - \frac{(I-A)-C}{ep_H}$ into the first term in the LHS of Eq. (42) to find

$$e\left[R - \frac{(I-A)-C}{ep_H}\right] + (1-e)R - L + S \geq \frac{B}{\Delta p}. \tag{43}$$

I then simply the Eq. (43) to

$$e\left[R - \frac{(I-A)-C}{ep_H}\right] + (1-e)R - L + S \geq \frac{B}{\Delta p},$$

$$eR - \frac{(I-A)-C}{p_H} + R - eR - L + S \geq \frac{B}{\Delta p},$$

$$-\frac{(I-A)-C}{p_H} + R - L + S \geq \frac{B}{\Delta p},$$

$$-\frac{(I-A)-C}{p_H} \geq -\left[R - \frac{B}{\Delta p} - L + S\right],$$

$$-I + A + C \geq -p_H\left[R - \frac{B}{\Delta p} - L + S\right],$$

$$A \geq I - p_H\left[R - \frac{B}{\Delta p} - L + S\right] - C = \bar{A}.$$

A.5 Derivation of Eq. (28)

I set the FOC of Eq. (27) to zero to find

$$\begin{aligned}
\frac{\partial E[NPV|Hard]^{Total}}{\partial I} &= \alpha p_H R I^{\alpha-1} - p_H(L-S) + C - 1 = 0 \\
\alpha p_H R I^{\alpha-1} &= 1 + p_H(L-S) - C \\
I^{\alpha-1} &= \frac{1 + p_H(L-S) - C}{\alpha p_H R} \\
\frac{1}{I^{1-\alpha}} &= \frac{1 + p_H(L-S) - C}{\alpha p_H R} \\
I^{1-\alpha} &= \frac{\alpha p_H R}{1 + p_H(L-S) - C} \\
I^* &= \left(\frac{\alpha p_H R}{1 + p_H(L-S) - C}\right)^{\frac{1}{1-\alpha}}
\end{aligned}$$

A.6 Check that borrower receives all economic rents

The expected NPV to the borrower is

$$E[NPV|Hard]_b = e p_H(R_b - L + S) + (1-e)p_H(R - L + S) - A \tag{44}$$

I substitute $R_b = R - \frac{(I-A)-C}{e p_H}$ into Eq. (44) and simplify to show

$$\begin{aligned}
E[NPV|Hard]_b &= e p_H \left(R - \frac{(I-A)-C}{e p_H} - L + S\right) - e p_H(R - L + S) + p_H(R - L + S) - A, \\
&= e p_H(R - L + S) - (I - A) + C - e p_H(R - L + S) + p_H(R - L + S) - A, \\
&= p_H(R - L + S) + C - I,
\end{aligned}$$

which equals the total project NPV.

A.7 Simplification of conditions in Eqs. (33), (34), and (35)

I simplify the condition in Eq. (33) to

$$\begin{aligned}
\bar{R}_1^n &< \bar{R}_1^p, \\
\frac{I}{p_H} &< \frac{I-C}{p_H} + L, \\
I &< I - C + p_H L, \\
-p_H L &< -C, \\
p_H L &> C.
\end{aligned}$$

I simplify the condition in Eq. (34) to

$$\begin{aligned}
\bar{R}_2^n &< \bar{R}_2^p, \\
\frac{(I-A)}{p_H} &< \frac{(I-A)-C}{ep_H} + L, \\
e(I-A) &< (I-A) - C + ep_H L, \\
-ep_H L + e(I-A) - (I-A) &< -C, \\
ep_H L - e(I-A) + (I-A) &> C, \\
ep_H L + (1-e)(I-A) &> C.
\end{aligned}$$

I simplify the condition in Eq. (34) to

$$\begin{aligned}
\bar{A}^n &< \bar{A}^p, \\
I - p_H \left[R - \frac{B}{\Delta p}\right] &< I - p_H \left[R - \frac{B}{\Delta p} - L + S\right] - C, \\
-p_H \left[R - \frac{B}{\Delta p}\right] &< -p_H \left[R - \frac{B}{\Delta p}\right] - p_H(-L+S) - C, \\
0 &< -p_H(-L+S) - C, \\
p_H(-L+S) &< -C, \\
p_H(L-S) &> C.
\end{aligned}$$

A.8 Derivation of investment levels for politically unconnected versus connected

I solve for the condition where a politically unconnected borrower invests more than a politically connected borrower as follows:

$$\begin{aligned}
I^{*n} &> I^{*p} \\
(\alpha p_H R)^{\frac{1}{1-\alpha}} &> \left(\frac{\alpha p_H R}{1 + p_H(L-S) - C}\right)^{\frac{1}{1-\alpha}} \\
\alpha p_H R &> \frac{\alpha p_H R}{1 + p_H(L-S) - C} \\
1 + p_H(L-S) - C &> 1 \\
p_H(L-S) - C &> 0 \\
p_H &> \frac{C}{L-S}, \qquad (45)
\end{aligned}$$

where Eq. (45) exactly matches Eq. (32).

A.9 Derivation of Eq. (32) for continuous investment case

Setting $C = L = S = 0$, I define the optimal investment of a politically unconnected borrower for the continuous investment model as

$$I^{*n} = (\alpha p_H R)^{\frac{1}{1-\alpha}}. \tag{46}$$

I substitute Eq. (46) into the expected NPV in Eq. (27), where $C = L = S = 0$ to find

$$\begin{aligned}
E[NPV|Hard]_b^n &= p_H R I^\alpha - I \\
&= p_H R(\alpha p_H R)^{\frac{\alpha}{1-\alpha}} - (\alpha p_H R)^{\frac{1}{1-\alpha}} \\
&= (p_H R)(p_H R)^{\frac{\alpha}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} - (p_H R)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} \\
&= (p_H R)^{\frac{1-\alpha+\alpha}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} - (p_H R)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} \\
&= (p_H R)^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} - (p_H R)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}} \\
&= (p_H R)^{\frac{1}{1-\alpha}} (\alpha^{\frac{\alpha}{1-\alpha}} - \alpha^{\frac{1}{1-\alpha}}).
\end{aligned} \tag{47}$$

To solve for the expected NPV of a borrower that chooses to be politically connected, I substitute Eq. (28) into Eq. (27) to find

$$\begin{aligned}
E[NPV|Hard]_b^p &= p_H(RI^\alpha - LI + SI) + CI - I \\
&= p_H R I^\alpha - p_H(L - S)I + (C - 1)I \\
&= p_H R I^\alpha - [1 + p_H(L - S) - C]\, I \\
&= p_H R \left(\frac{\alpha p_H R}{1 + p_H(L - S) - C} \right)^{\frac{\alpha}{1-\alpha}} - [1 + p_H(L - S) - C] \left(\frac{\alpha p_H R}{1 + p_H(L - S) - C} \right)^{\frac{1}{1-\alpha}} \\
&= \frac{(p_H R)^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}}}{(1 + p_H(L - S) - C)^{\frac{\alpha}{1-\alpha}}} - \frac{(p_H R)^{\frac{1}{1-\alpha}} \alpha^{\frac{1}{1-\alpha}}}{(1 + p_H(L - S) - C)^{\frac{\alpha}{1-\alpha}}} \\
&= \frac{(p_H R)^{\frac{1}{1-\alpha}}}{(1 + p_H(L - S) - C)^{\frac{\alpha}{1-\alpha}}} (\alpha^{\frac{\alpha}{1-\alpha}} - \alpha^{\frac{1}{1-\alpha}}).
\end{aligned} \tag{48}$$

I then solve for the conditions where the expected NPV for a politically unconnected borrower is greater than a politically connected borrower as follows:

$$
\begin{aligned}
E[NPV|Hard]_b^n &> E[NPV|Hard]_b^p \\
(p_H R)^{\frac{1}{1-\alpha}}(\alpha^{\frac{\alpha}{1-\alpha}} - \alpha^{\frac{1}{1-\alpha}}) &> \frac{(p_H R)^{\frac{1}{1-\alpha}}}{(1 + p_H(L-S) - C)^{\frac{\alpha}{1-\alpha}}}(\alpha^{\frac{\alpha}{1-\alpha}} - \alpha^{\frac{1}{1-\alpha}}) \\
1 &> \frac{1}{(1 + p_H(L-S) - C)^{\frac{\alpha}{1-\alpha}}} \\
(1 + p_H(L-S) - C)^{\frac{\alpha}{1-\alpha}} &> 1 \\
1 + p_H(L-S) - C &> 1 \\
p_H(L-S) - C &> 0 \\
p_H &> \frac{C}{L-S}, \qquad (49)
\end{aligned}
$$

where Eq. (49) exactly matches Eq. (32).

References

Allen, F., Qian, J., Qian, M., 7 2005. Law, finance, and economic growth in China. Journal of Financial Economics 77 (1), 57–116.

Berkman, H., Cole, R. A., Fu, L. J., 2009. Expropriation through loan guarantees to related parties: Evidence from China. Journal of Banking & Finance 33 (1), 141–156.

Bliss, M. A., Gul, F. A., 2012a. Political connection and cost of debt: Some Malaysian evidence. Journal of Banking & Finance 36 (5), 1520–1527.

Bliss, M. A., Gul, F. A., 2012b. Political connection and leverage: Some Malaysian evidence. Journal of Banking & Finance 36 (8), 2344–2350.

Chen, D., Jiang, D., Ljungqvist, A., Lu, H., Zhou, M., 2015. State capitalism vs. private enterprise. NBER Working Paper, 1–55.

Chen, S., Sun, Z., Tang, S., Wu, D., 2011. Government intervention and investment efficiency: Evidence from china. Journal of Corporate Finance 17 (2), 259–271.

Chen, Y., Liu, M., Su, J., 2013. Greasing the wheels of bank lending: Evidence from private firms in China. Journal of Banking & Finance 37 (7), 2533–2545.

Claessens, S., Feijen, E., Laeven, L., 2008. Political connections and preferential access to finance: The role of campaign contributions. Journal of Financial Economics 88 (3), 554–580.

Dinc, I. S., 2005. Politicians and banks: Political influences on government-owned banks in emerging markets. Journal of Financial Economics 77 (2), 453–479.

Easley, D., Kleinberg, J., 2010. Networks, crowds, and markets:Reasoning about a highly connected world, 1st Edition. Cambridge University Press, New York.

Faccio, M., 2006. Politically connected firms. The American Economic Review 96 (1), 369–386.

Fan, J. P. H., Wong, T. J., Zhang, T., 2007. Politically connected CEOs, corporate governance, and Post-IPO performance of China's newly partially privatized firms. Journal of Financial Economics 84 (2), 330–357.

Firth, M., Lin, C., Liu, P., Wong, S. M. L., 2009. Inside the black box: Bank credit allocation in China's private sector. Journal of Banking & Finance 33 (6), 1144–1155.

Infante, L., Piazza, M., 2014. Political connections and preferential lending at local level: Some evidence from the italian credit market. Journal of Corporate Finance 29, 246–262.

Keefe, M. O., Kieschnick, R., 2014. The influence of moral hazard on investment in financially constrained and unconstrained firms. Finance Research Letters 11 (3), 272–281.

Khwaja, A. I., Mian, A., 2005. Do lenders favor politically connected firms? Rent provision in an emerging financial market. The Quarterly Journal of Economics 120 (4), 1371–1411.

Kornai, J., Maskin, E., Roland, G., 2003. Understanding the soft budget constraint. Journal of Economic Literature 41 (4), 1095–1136.

Krueger, A. O., 1974. The political economy of the rent-seeking society. The American Economic Review 64 (3), 291–303.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2002. Government ownership of banks. The Journal of Finance 57 (1), 265–301.

Li, H., Meng, L., Wang, Q., Zhou, L.-A., 2008. Political connections, financing and firm performance: Evidence from chinese private firms. Journal of Development Economics 87 (2), 283–299.

Lu, Z., Zhu, J., Zhang, W., 2012. Bank discrimination, holding bank ownership, and economic consequences: Evidence from China. Journal of Banking & Finance 36 (2), 341–354.

Shleifer, A., Vishny, R. W., 1993. Corruption. The Quarterly Journal of Economics 108 (3), 599–617.

Shleifer, A., Vishny, R. W., 1994. Politicians and firms. The Quarterly Journal of Economics 109 (4), 995–1025.

Stulz, R. M., 2005. The limits of financial globalization. The Journal of Finance 60 (4), 1595–1638.

Tirole, J., 2006. The Theory of Corporate Finance, 1st Edition. Princeton University Press, Princeton, New Jersey.

Wei, L., Zhu, G., Sept. 13 2015. China unveils overhaul of bloated state sector: Beijing to allow state-owned enterprises to add private investors. Wall Street Journal Online.

Table 1: Investments and Payoffs

This table shows the investments and payoffs associated with total project, the borrower and the lender. Panel A shows the total, borrower, and lender investments at $t = 0$. Panels B and C show the payoffs and expected NPVs for the total project, the borrower, and lender. Panel B assumes the manager works hard and Panel C the manager shirks.

Panel A: Investment at $t = 0$				
		Total	Borrower	Lender
	Investment	I	A	$I - A$
Panel B: Cash Flow at $t = 1$ if manager works hard				
Probability	Outcome	Total	Borrower	Lender
ep_H	Enforcement & Success	$R - L + S + C$	$R_b - L + S$	$R - R_b + C$
$(1 - e)p_H$	Expropriation & Success	$R - L + S + C$	$R - L + S$	C
$1 - p_H$	Failure	C	0	C
Panel C: Cash Flow at $t = 1$ if manager shirks				
Probability	Outcome	Total	Borrower	Lender
ep_L	Enforcement & Success	$R - L + S + C + B$	$R_b - L + S + B$	$R - R_b + C$
$(1 - e)p_L$	Expropriation & Success	$R - L + S + C + B$	$R - L + S + B$	C
$1 - p_L$	Failure	$C + B$	B	C

Table 2: Fixed Investment Example:
This table provides an illustrative example where a borrower has an investment opportunity of $I = 100$ with a return of $R = 125$ in the case of success and zero in the case of failure. If the borrower works hard the probability of success is $p_H = 87\%$. If the borrower shirks the probability of success is $p_L = 0.60$ with a private benefit of $B = 12$. The borrower holds cash of $A = 30$. Columns (1) through (6) of Panel A show various scenarios with different values of e, S, L, and C. Panel B provides model outputs for each scenario. Panel C provides shows the minimum return and cash required to obtain financing.

Panel A: Political Connection Parameters							
Definiton	Parameter	(1)	(2)	(3)	(4)	(5)	(6)
Enforcement Probability	e	1	0.95	0.95	0.95	0.95	0.60
Borrower Social Gain	S	0	0	0	5	5	5
Borrower Social Loss	L	0	0	0	6	12	6
Lender Compensation	C	0	0	3.5	3.5	3.5	3.5
Panel B: Model Outputs							
Output	Equation	(1)	(2)	(3)	(4)	(5)	(6)
$E[NPV\|Hard]_{Total}$	$p_H(R - L + S) + C - I$	8.75	8.75	12.25	11.38	6.16	11.38
$E[NPV\|Shirk]_{Total}$	$p_L(R - L + S) + B + C - I$	-13	-13	-9.5	-10.1	-13.7	-10.1
Δp	$p_H - p_L$	0.27	0.27	0.27	0.27	0.27	0.27
Loan	$I - A$	70	70	70	70	70	70
R_b	$R - \frac{(I-A)-C}{ep_H}$	44.54	40.31	44.54	44.54	44.54	-2.39
R_l	$\frac{(I-A)-C}{ep_H}$	80.46	84.69	80.46	80.46	80.46	127.39
$E[NPV\|Hard]_b$	$p_H\left[eR_b + (1-e)R - L + S\right]$	8.75	8.75	12.25	11.38	6.16	11.38
$E[NPV\|Shirk]_b$	$p_L\left[eR_b + (1-e)R - L + S\right] + B$	8.72	8.72	11.14	10.54	6.94	10.54
$E[r]$	$1 - \frac{C}{I-A}$	100.00%	100.00%	95.00%	95.00%	95.00%	95.00%
d	$1 - ep_H$	13.00%	17.35%	17.35%	17.35%	17.35%	47.80%
i	$\frac{1}{ep_H}\left(1 - \frac{C}{I-A}\right) - 1$	14.94%	20.99%	14.94%	14.94%	14.94%	81.99%
Panel C: Access to Finance							
Minimum	Equation	(1)	(2)	(3)	(4)	(5)	(6)
$\bar{R}_1$	$\frac{I-C}{p_H} + L$	114.94	114.94	110.92	116.92	122.92	116.92
$\bar{R}_2$	$\frac{(I-A)-C}{ep_H} + L$	80.46	84.69	80.46	86.46	92.46	133.39
$\bar{A}$	$I - p_H\left[R - \frac{B}{\Delta p} - L + S\right] - C$	29.92	29.92	26.42	27.29	32.51	27.29
Access to Finance?		Yes	Yes	Yes	Yes	No	No

Table 3: Continuous Investment Example:
This table provides an illustrative example where a borrower has an investment opportunity of I with a return of RI^{α} in the case of success and zero in the case of failure. The probability of success conditional on the borrower working hard is $p_H = 0.87$, the return to scale parameter is $\alpha = 0.75$, and the proportional return is $R = 5$. Columns (1) through (3) of Panel A show various scenarios with different values of e, S, L, and C. Panel B provides model outputs for each scenario, including the choice of the manager regarding whether to be politically connected or not.

Panel A: Political Connection Parameters				
Definiton	Parameter	(1)	(2)	(3)
Enforcement Probability	e	0.95	1	0.95
Borrower Social Gain	S	2	0	2
Borrower Social Loss	L	3.3	0	3
Lender Compensation	C	1	0	1
Panel B: Model Outputs				
Output	Equation	(1)	(2)	(3)
I^*	$I^* = \left(\frac{\alpha p_H R}{1+p_H(L-S)-C}\right)^{\frac{1}{1-\alpha}}$	69.24	113.29	197.75
$E[NPV\|Hard]_{Total}$	$p_H(RI^{*\alpha} - LI^* + SI^*) + CI^* - I^*$	26.10	37.76	57.35
$E[ProjectNPV]$	$p_H RI^{*\alpha} - I^*$	35.17	37.76	31.64
Decision Criteria	$\frac{C}{L-S}$	0.77	N.A.	1.00
Politically Unconnected	$p_H > \frac{C}{L-S}$	Yes		No