

# Unbundling Institutions\*

Daron Acemoglu  
MIT

Simon Johnson  
MIT

July 2003.

## Abstract

This paper evaluates the importance of “property rights institutions”, which protect citizens against expropriation by the government and powerful elites, and “contracting institutions”, which enable private contracts between citizens. We exploit exogenous variation in both types of institutions driven by colonial history, and document strong first-stage relationships between property rights institutions and the determinants of European colonization strategy (settler mortality and population density before colonization), and between contracting institutions and the identity of the colonizing power. Using this instrumental variables approach, we find that property rights institutions have a first-order effect on long-run economic growth, investment, and financial development. Contracting institutions appear to matter only for the form of financial intermediation. A possible explanation for this pattern is that individuals often find ways of altering the terms of their formal and informal contracts to avoid the adverse effects of contracting institutions, but are unable to do so against the risk of expropriation.

**Keywords:** Contracts, Economic Growth, Financial Development, Institutions, Law and Finance, Legal Formalism, Legal Origin, Political Economy, Politics, Property Rights.

**JEL Numbers:** E44, G18, K00, N20, P16, P17.

---

\*We thank Simeon Djankov, Rafael La Porta, Amir Licht, Florencio Lopez-de-Silanes, Andrei Shleifer, and seminar participants at the Canadian Institute for Advanced Research, MIT, and the University of Illinois for helpful comments and discussions. We also thank Simeon Djankov, Ross Levine, Florencio Lopez-de-Silanes, and Todd Mitton for generously providing data.

# 1 Introduction

Douglass North opens *Structure and Change in Economic History* by distinguishing between a “contract theory” of the state and a “predatory theory” of the state (1981, pp. 20-27). According to the first theory, the state and associated institutions provide the legal framework that enables private contracts to facilitate economic transactions (i.e., “reduce transaction costs”). According to the second, the state is an instrument for transferring resources from one group to another. Throughout his book, North develops a story combining the two theories, and argues that good institutions will simultaneously support private contracts and provide checks against expropriation by the government or other politically powerful groups.

There is a growing consensus among economists and political scientists that the broad outlines of North’s story are correct: the social, economic, legal, and political organization of a society, i.e., its “institutions,” is a primary determinant of economic performance. However, like North, the contemporary literature has not attempted to determine the relative roles of institutions supporting private contracts (“contracting institutions”) and institutions constraining government and elite expropriation (“property rights institutions”).<sup>1</sup> Instead, it has documented the importance of a “cluster” of institutions that include both contracting and private property protection elements. This is in spite of well-established theoretical arguments emphasizing each set of institutions. For example, the contract theory literature, starting with Coase (1937, and especially 1960) and Williamson (1975, 1985), links the efficiency of organizations and societies to what type of contracts can be written and enforced, and thus underscores the importance of contracting institutions (see also Grossman and Hart, 1986, Hart and Moore, 1990, and Hart, 1995). In contrast, other authors emphasize the importance of private property rights, especially their protection against government expropriation (see, among others, Jones, 1981, De Long and Shleifer, 1993, or Olson, 2000).

This paper is an attempt to unbundle the broad cluster of institutions, and learn more

---

<sup>1</sup>Alternatively, we could refer to institutions constraining government expropriation as “political institutions” as we did in a previous version of this paper. We decided not to use this term, since some readers interpreted it as referring to the type of constitution or to the ideological leanings of politicians or society. In addition, “contracting institutions” could be called “legal institutions”. We opted for the former term, since certain aspects of the legal institutions, such as the independence of the judiciary from politics, may have an important effect on the security of property rights against expropriation by the government or other powerful groups.

about the relative importance of contracting versus property rights institutions at the macro level. Such an attempt has to start with some proxies for the two sets of institutions. We will proxy property rights institutions using two alternative measures: Political Risk Services' assessment of protection against government expropriation in a country, and Polity IV's constraint on the executive measure.<sup>2</sup> For contracting institutions, we would like a measure of costs of enforcing private contracts (contracts where both parties are ordinary citizens), and we proxy this with the data on legal formalism developed and used by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002, 2003). This variable measures the number of formal legal procedures necessary to resolve a simple case of collecting on an unpaid check or evicting a non-paying tenant. These authors show that countries with greater legal formalism have higher costs of enforcing simple contracts, longer delays in courts, and lower perceived fairness and efficiency of the judiciary system. It is then natural to presume that greater legal formalism is a proxy for worse contracting institutions.<sup>3</sup> In Ordinary Least Squares (OLS) regressions, long-run economic growth, investment rates, and financial development are correlated with both contracting institutions and property rights institutions. However, OLS correlations do not establish a causal effect. To make further progress, we need to isolate potentially exogenous sources of variation in both legal formalism and private property rights.

Fortunately, the literature offers potential instruments for both variables. Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002, 2003), building on work by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) and by legal scholars such as Dawson (1960) and Merryman (1985), show that the "legal origin" of a country has an important effect on the degree of legal formalism, and most relevant for our sample, countries with French legal origin have substantially higher degrees of legal formalism than English legal origin countries. Moreover, as they point out, at least for former European colonies, the legal system can be thought of as "exogenous", because it was largely imposed by colonial

---

<sup>2</sup>Constraint on the executive is clearly related to the "political institutions" of a society. Our use of this measure as a proxy for property rights institutions reflects the fact that political constraints on the executive are closely interwoven with the security of property rights.

<sup>3</sup>Djankov et al. do not relate legal formalism to long-run economic growth. But this seems a natural step: if legal formalism affects the costs of contract enforcement (as Djankov et al. argue) and if contracting institutions are important for growth (as North and many others argue), then there should be an effect of legal formalism on economic growth.

The legal formalism data are available from the World Bank's Doing Business website, under the heading Contract Enforcement: <http://rru.worldbank.org/DoingBusiness/>.

powers.<sup>4</sup> Our previous work in Acemoglu, Johnson, and Robinson (2001, 2002), on the other hand, shows the importance of the mortality rate facing potential European settlers and population density before colonization on the colonization strategy of Europeans. Via this channel, these variables have influenced the historical development of the state-society relations and the degree of private property rights enforcement in the former colonies today.

Our approach in this paper is to use a multiple instrumental variables (IV) strategy, exploiting these sources of variation. The success of the multiple IV strategy depends on the two sets of instruments to isolate the contracting and property rights channels. In this respect, colonial history offers an ideal setup. In the sample of former European colonies, the legal system imposed by colonial powers has a strong effect on the degree of legal formalism, and almost no effect on measures of property rights institutions today. At the same time, both mortality rates for potential European settlers and population density in 1500 have a large effect on current property rights institutions, and no impact on measures of legal formalism.

The results of our empirical investigation using this multiple IV strategy are interesting: we find strong support for the importance of property rights institutions on current economic outcomes. Countries with greater constraints on politicians and elites, and more protection against expropriation by these powerful groups, have substantially higher income per capita (i.e., higher long-run growth rates), greater investment rates, more credit to the private sector relative to GDP, and more developed stock markets. In contrast, our findings indicate that the role of contracting institutions is more limited. Countries with greater legal formalism have less developed stock markets. However, once we control for the effects of property rights institutions, legal formalism seems to have no impact on income per capita, the investment to GDP ratio, and the private credit to GDP ratio.

These results suggest that contracting institutions affect the form of financial inter-

---

<sup>4</sup>The La Porta et al. papers suggest a number of channels through which legal origin could affect economic outcomes. In addition, Glaeser and Shleifer (2002) argue that the origin of the legal system affects not only legal transactions, but also regulates the power of politically powerful groups. Mahoney (2001) also argues that legal origin has a positive effect on economic growth through channels other than legal formalism. If these views are correct, our IV estimates for the importance of legal formalism, and therefore for contracting institutions, will be biased upwards. Consequently, our estimates of the importance of contractual institutions can be interpreted as upper bounds. The reduced-form evidence in the Appendix Table A3 does not show any evidence of a significant (direct or indirect) effect of legal origin on economic growth, investment, bank credit, or stock market development once we control and instrument for property rights.

mediation, but have less effect on economic growth, investment, and the overall level of financial development. It seems that society can function in the face of weak contracting institutions without first-order economic costs, but has a much harder time dealing with a significant risk of expropriation from the government or other powerful groups.<sup>5</sup> Our interpretation, consistent with the simple model we use to highlight the distinction between contracting and property rights institutions, is that contracting institutions affect private transactions and create ex post transfers between parties (for example, when lenders face large costs of collecting on their loans from borrowers). Private contracts or other reputation-based mechanisms can, at least in part, alleviate these problems.<sup>6</sup> For example, when it is more difficult for lenders to collect on their loans, interest rates increase, or banks that can monitor effectively will play a more important role, or reputation-based credit relationships will develop. Private contracting and alternative financial arrangements therefore limit the effects of contracting institutions and legal formalism.

In contrast, protection of private property rights relates to the relationship between the state and the citizens. When there are no checks on the state, on politicians, and on elites, private citizens do not have the security of property rights necessary for investment. In this case, they are also unable to enter into private arrangements to circumvent these problems; it is impossible to write credible contracts with the state to prevent future expropriation, since the state, with its monopoly of legitimate violence, is the ultimate arbiter of contracts (see Acemoglu, 2003a).

At this point we have to emphasize the limitations of our analysis. First, to the extent that contracting and property rights institutions interact in regulating relations between the state and citizens, or even between citizens, the interpretation of our results is more

---

<sup>5</sup>This pattern is also consistent with the results we obtain using the entry barriers data from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002). We find that the key determinant of the number of procedures to open a new business is legal formalism—greater legal formalism, naturally, means more procedures. However, when we use their measures for the total costs of opening new businesses, the main determinant appears to be property rights institutions, not legal formalism. Therefore, it again appears that contracting institutions affect the form of economic transactions, but have less impact on the overall economic outcome (here, the total cost of opening a business).

<sup>6</sup>See the emphasis of, among others, Ellickson (1991) and Greif (1989) on the ability of individual agents to substitute reputation-based arrangements for legal contracts. The World Bank’s Doing Business study has found that in countries such as Bulgaria, Egypt, Mozambique, and Tunisia, creditors structure contracts so as to be able to seize collateral when a borrower defaults without using standard slow court procedures (Djankov, 2003). Naturally, as also highlighted by the theoretical model below, there may exist a certain threshold beyond which contracting institutions may matter more, and consequently, our results here are consistent with the notion that a substantial worsening in contracting institutions could have significant economic implications.

difficult.<sup>7</sup> Second, our “property rights institutions” are still somewhat of a black box, and could reflect the effect of other political or non-political institutional features.<sup>8</sup>

In addition to work by La Porta et al., Djankov et al., and Acemoglu et al., the papers closest to our work are Beck, Demirgüç-Kunt, and Levine (2003a, 2003b), and Rajan and Zingales (2003), which critically evaluate the effect of legal origin on financial development. Beck, Demirgüç-Kunt, and Levine (2003a) find evidence that both legal origin and potential settler mortality matter for financial development.<sup>9</sup> However, they only estimate reduced-form relationships and do not specify the mechanisms through which legal origin may affect economic and financial outcomes. Beck, Demirgüç-Kunt, and Levine (2003b) test whether legal origin matters because it affects state control over the judiciary, or because some legal systems are more “adaptable” than others. They do not address the nature or origin of property rights institutions.<sup>10</sup>

Rajan and Zingales (2003) offer an “interest group” explanation for the development of investor protection in Europe. They argue that changes in financial arrangements at the turn of the twentieth century are evidence against “time invariant” explanations, such as the legal origin approach, and instead support their theory in which incumbent producers oppose financial development to prevent entry from newcomers. In contrast, in our model and empirical work, we focus on the effect of legal origin on legal formalism, and show that contracting institutions and legal formalism generally matter less than property rights institutions for credit, investment, and long-run economic growth.<sup>11</sup>

---

<sup>7</sup>But in our defense, we find no evidence in the data for a significant interaction effect between property rights and contracting institutions. Moreover, if legal formalism also determines how constrained politicians and political elites are in practice, this would create an upward bias in our estimates for the importance of contracting institutions.

<sup>8</sup>In Acemoglu, Johnson, and Robinson (2001, 2002), we provide detailed evidence that the effects of mortality rates for potential European settlers and population density in 1500 are working through institutions, and not through geographic, religious, or some other omitted factors.

<sup>9</sup>Levine (2002), Beck and Levine (2002), and Demirgüç-Kunt and Maksimovic (2002) all find a link between legal origin and both the level of financial development and the extent to which external finance is market- rather than bank-based. Levine (2003) reports results where legal origin explains the level of financial development across countries and these in turn account for differences in long-run growth.

<sup>10</sup>See also Berkowitz, Pistor, and Richard (2003), who argue that countries that developed their own legal systems, or that substantially adapted any “transplanted” law, have a more effective legal system, and Johnson, McMillan, and Woodruff (2002), who present micro evidence from five post-communist countries showing that effective property rights matter more for firm investment than financial constraints.

<sup>11</sup>Finally, there is also some recent work investigating which type of institutions matter more for economic outcomes. For example, Persson and Tabellini (1999) find that within the set of democracies, presidential regimes have smaller governments and majoritarian (non-proportional representation) electoral systems are correlated with less government spending and less welfare spending. Barro (1997), on the other hand, investigates the relative importance of rule of law and democracy in stimulating economic

Section 2 develops a simple model to highlight how contracting and property rights institutions might have different effects on economic outcomes. Section 3 discusses our empirical strategy and the basic data. Section 4 provides details on the sample and descriptive statistics. Section 5 shows some basic univariate results. Section 6 provides our main results, contrasting the impact of contracting and property rights institutions on a range of economic outcomes. It also contains robustness checks. Section 7 concludes.

## 2 Theory

We now outline a simple reduced-form model to highlight how differences in contracting and property rights institutions affect financial and economic outcomes. We think of contracting institutions as mainly affecting the costs of enforcing private contracts. Property rights institutions, on the other hand, determine the interaction between individuals and the government (and the political elites who control the government). When property rights institutions do not constrain elites, these elites are more likely to violate the property rights of individual producers and expropriate their incomes or assets.

The purpose of this model is not to develop a micro-founded analysis of financial intermediation or the role of property rights institutions, but simply to highlight issues that will help with interpretation of our empirical results. In particular, the model illustrates how, under certain circumstances, contracting institutions may influence the form of financial transactions but have relatively limited effects on the overall level of financial intermediation, investment, and output, because individuals can vary the terms of their contracts *ex ante* to deal with the *ex post* costs of contract enforcement.

### 2.1 The Environment

The model lasts for one period and consists of three groups of agents: producers, lenders, and the elite. All agents are risk neutral. There is a unique good that can be used for investment or consumption. We normalize the number of producers to 1. Lenders have sufficient funds to lend to producers, but no investment opportunities. Producers have productive investment opportunities but no funds to undertake these investments.

---

growth. These studies typically do not isolate an exogenous source of variation in institutions, so the results may reflect omitted factors or be driven by differential measurement error (hence attenuation bias) in various measures of institutions.

Finally, elites do not have a directly productive role, but control the state apparatus, and can use their political power to expropriate the incomes of other groups in society.<sup>12</sup>

We will think of contracting institutions as regulating the relationship between lenders and producers, and property rights institutions as affecting the relationship between producers and lenders on the one hand and the elite on the other.

Each producer can produce  $a > 1$  units of the final good by investing 1 unit. Each producer  $j$  also incurs a non-pecuniary cost  $e_j$  when she undertakes production. The distribution of  $e_j$  in the population is given by a continuous distribution function  $G(e)$ . Since producers have no funds, each of them needs to borrow 1 unit from the lenders. They can do this using either a debt contract or an equity contract. We start with a discussion of the debt contract, returning to equity contracts later. The cost of providing 1 unit of loan to a producer with a debt contract is  $1 + m^d$  where  $m^d < a - 1$  represents administrative costs, or costs of collecting funds from savers. A debt contract will specify a gross interest rate  $R$  that the lender has to repay. However, the producer can renege on her payment promise. In this case, the lender can take the producer to court. The cost of taking producer  $j$  to court, i.e., filing a complaint, is

$$C^d + \theta_j \tag{1}$$

where  $C^d$  is a feature of the legal system that is specific to debt contracts. A higher  $C^d$  implies that enforcing debt contracts is more costly, which may be because there is a high degree of “legal formalism”. The parameter  $\theta_j$  is project complexity, which determines how costly it will be for the lender to prove that there is malfeasance by the producer. For example, if the project turns out to be very complex (or difficult to monitor or adjudicate), the producer may find ways of not repaying without the court easily detecting this, e.g., diverting the proceeds while pretending to be bankrupt. If the lender files a complaint, he incurs the cost in (1) and always wins and receives the promised payment, while the producer incurs some positive cost  $\varepsilon$ . If the lender does not file a complaint after the

---

<sup>12</sup>A central assumption here is that producers are distinct both from the elite and from the lenders (we do not need these groups to be disjoint, but simply to be sufficiently distinct). This assumption is reasonable given our focus on financial relations and growth in modern economies. Although there have been societies such as the plantation economies of the Caribbean between 17th and 19th centuries where the elites were also the producers, in most modern societies there are important producer groups outside the elite. Moreover, in many societies expropriation by government is a major concern, and in this case there is a natural distinction between producers and groups involved in expropriation. In addition, the distinction between lenders and producers is a key element of any modern economy—without this distinction, a discussion of financial intermediation would not be meaningful.



producer reneges, there is no repayment and the producer receives the full output of the project. We assume that  $\theta_j$  is distributed uniformly in the population between 0 and 1.

Finally, the elite can decide to expropriate the returns from the project. However, they can only do so when the checks and balances that the society imposes on them are sufficiently lax. We model this by assuming that “property rights institutions” constrain the elite in their expropriation. More specifically, after investment decisions take place, the aggregate state of nature  $\sigma$  is realized, and expropriation is avoided if  $\sigma \leq P$ . In this formulation,  $P$  measures the degree of political checks and balances on the elite. For example, a stronger, more independent legislature (assuming this represents non-elites) would correspond to a high value of  $P$ , meaning that only in special circumstances can the elite expropriate producers. We assume that the distribution of  $\sigma$  is given by a continuous distribution function,  $F(\sigma)$ ; this represents political events that we are not modelling explicitly here. What matters for the economic decisions of producers and lenders will be the risk of expropriation by the elite, and with this reduced-form modeling we want to emphasize that this risk is in turn related to political constraints that society imposes on the elite and the government.

The timing of events in this economy is as follows:

1. Producers observe their non-pecuniary cost of production,  $\{e_j\}$ .
2. Lenders compete to provide funds to producers.
3. The aggregate state  $\sigma$  is realized, and the elite take the expropriation decision.
4. Producers and lenders observe the realization of the project complexity,  $\{\theta_j\}$ .
5. If there has been no expropriation, producers decide whether to renege on their payments.
6. Lenders decide whether to take producers who have reneged to court or not.
7. Returns are realized and consumed.

We next characterize the subgame perfect equilibrium of this game in the standard way by backward induction. This equilibrium will turn out to be unique.

## 2.2 Equilibrium with Only Debt Contracts

Let us start with a subgame where there has been no expropriation and producer  $j$ , who has borrowed at the rate  $R$ , reneges. Then the payoff from the strategy of filing a complaint for the lender, conditional on the realization of project complexity  $\theta_j$ , is:  $V(\text{file} | R, \theta_j) = R - 1 - m^d - \theta_j - C^d$ , since in this case he will get back  $R$ , he has already incurred the investment cost,  $1 + m^d$ , and he will incur the legal costs  $\theta_j + C^d$ . The payoff when he does not file a complaint is  $V(\text{no file} | R, \theta_j) = -1 - m^d$ , as he will not incur legal costs, but will also not receive the payment  $R$ . Therefore, the lender will file if

$$\theta_j \leq R - C^d. \quad (2)$$

Since renegeing on the debt contract when the lender files a complaint is costly and creates no benefits, the producer will renege only when (2) does not hold. Given the uniform assumption, the probability of repayment before the realization of  $\theta_j$  is therefore

$$\min \langle \max \langle R - C^d, 0 \rangle, 1 \rangle,$$

where the max and min operators make sure that the probability remains bounded between 0 and 1. We assume throughout that  $C^d \geq (1 + m^d) F(P)^{-1} - 1$ , which ensures that  $0 \leq R - C^d \leq 1$  (see footnote 14). Then, using the fact that the elites will expropriate whenever  $\sigma > P$ ,<sup>13</sup> the expected return of a lender at the lending stage (before  $\sigma$  and  $\theta_j$  are realized) is:

$$V(\text{lend} | R) = -1 - m^d + F(P)(R - C^d)R,$$

where the first two terms are the costs of lending and monitoring, and the third term is the probability that there will be no expropriation,  $F(P)$ , times the probability that there is no renegeing,  $(R - C^d)$ , times the repayment amount,  $R$ . By not lending, the lender will receive 0. Thus, we need  $V(\text{lend} | R) \geq 0$ . Moreover, since there are sufficient funds among lenders to cover all the demand for funds from producers, whenever  $V(\text{lend} | R) > 0$ , competition between lenders will reduce  $R$ , so in equilibrium we must have  $V(\text{lend} | R) = 0$ . Straightforward algebra shows that the unique positive solution

---

<sup>13</sup>With a reasoning similar to that for the Laffer curve, for very high values of  $P$  the ruling elite or the government may want to reduce  $P$  in order to encourage greater investment and increase their revenues. The simplifying assumption here is that they are unable to do so (see Acemoglu, 2003b, for more discussion).

to this equation is:<sup>14</sup>

$$R = \frac{C^d + \sqrt{(C^d)^2 + 4(1 + m^d)F(P)^{-1}}}{2}. \quad (3)$$

However, for the producer to be able to repay, we also need  $R \leq a$ , or

$$C^d \leq \bar{C}^d(P) \equiv a - \frac{(1 + m^d)F(P)^{-1}}{a}. \quad (4)$$

In other words, for the credit market not to collapse, the legal costs of enforcing contracts need to be less than a critical threshold. Moreover,  $\bar{C}^d(P)$  is increasing in  $P$ , so that better property rights institutions increase the range of legal costs over which a credit market can be supported.

It can also be verified that  $\partial R / \partial C^d > 0$  and  $\partial R / \partial F < 0$ , thus better contracting institutions and stronger constraints on elites reduce the required repayments (the interest rate) in the credit market.

Now going to the first stage of the game, we can write the expected utility of a producer with effort cost  $e_j$  as:

$$U_j(e_j | R) = F(P) [a - (R - C^d)R] - e_j,$$

which takes into account that with probability  $1 - F(P)$ , there is expropriation by the elite. Otherwise, the producer receives the output  $a$ , and whether she makes the payment back to lenders depends on the realization of  $\theta_j$ . With probability  $R - C^d$ , we have  $\theta_j \leq R - C^d$ , so she will have to make the payment. Using (3) to substitute out for  $R$ , we obtain:

$$U_j(e_j) = F(P) a - 1 - m^d - e_j. \quad (5)$$

Notice an important feature of (5): as long as (4) is satisfied,  $U_j(e_j)$  does not depend on  $C^d$ . This is because lenders and producers write ex ante contracts, and they can change the terms of these contracts to deal with the fact that there is a low probability

---

<sup>14</sup>Note that  $R - C^d \geq 0$  is always true. Straightforward algebra using (3) establishes that as long as  $C^d \geq (1 + m^d)F(P)^{-1} - 1$ , we also have  $R - C^d \leq 1$ , as claimed in the text. Alternatively, if  $C^d < (1 + m^d)F(P)^{-1} - 1$ , then the probability that  $\theta_j < R - C^d$  is equal to 1, and as a result,  $R = (1 + m^d)F(P)^{-1}$ , and the credit market collapses only if  $(1 + m^d)F(P)^{-1} > a$ . Thus, if  $C^d < (1 + m^d)F(P)^{-1} - 1$ , the interest rate is  $R = (1 + m^d)F(P)^{-1}$  (as long as this is less than  $a$ ); if  $a - (1 + m^d)F(P)^{-1}/a \geq C^d \geq (1 + m^d)F(P)^{-1} - 1$ , the interest rate is given by (3), and if  $C^d > a - (1 + m^d)F(P)^{-1}/a$ , the credit market collapses.

of repayment when  $C^d$  is high. In other words,  $R$  adjusts to keep the expected payments from the producer to the lender constant irrespective of the value of  $C^d$ . Therefore, when  $C^d$  is high, the producer is more likely to be able to avoid payments, but in return, she will have to promise to pay a higher interest rate.<sup>15</sup>

To calculate total investment when (4) is satisfied, i.e., when the credit market does not collapse, notice that if the producer does not undertake the investment, she receives 0, so we need  $U_j(e_j | R) \geq 0$  for producer  $j$  to invest. Thus using the fact that the distribution of  $e_j$  is given by  $G(e)$ , total investment is given by:

$$I = G[F(P)a - 1 - m^d]. \quad (6)$$

Since all investment is financially intermediated, this is also total credit (financial intermediation) in the economy. This expression shows that, as long as (4) is satisfied, investment and credit are independent of  $C^d$ . Contracting institutions therefore may have limited effects on investment, because ex ante contracting enables the parties to circumvent potential enforcement problems. However, there are limits to this argument: if the cost of contract enforcement,  $C^d$ , is very high, the credit market will collapse and there will be no investment.

Notice also that when (4) holds, investment is always increasing in the degree of political constraints on elites, i.e.,  $\partial I / \partial P > 0$ . The reason why property rights institutions have a “more important” effect on investment than contracting institutions in this model is that, in contrast to contracts between lenders and producers, there are no ex ante contracts between producers (or lenders) and the elite that can be used to circumvent the ex post holdup and expropriation problem. Here we take it as given that such contracting possibilities are absent, but it is clear why this would be so: it is impossible to write credible contracts with the state to prevent future expropriation, since the state, with its monopoly of legitimate violence, is the ultimate arbiter of contracts.<sup>16</sup>

We can now summarize this discussion as follows:

---

<sup>15</sup>The fact that these two effects exactly cancel out is a special feature of this model, where parties never go to court along the equilibrium path. If they did,  $R$  would have to increase further to compensate lenders for the expected court costs as well, and  $C^d$  would have an effect on  $U_j(e_j)$ . Nevertheless, it can be verified that even in this case, ex ante contracting possibilities would reduce the effect of  $C^d$  on investment.

<sup>16</sup>One way of “writing” such contracts is through trigger strategies in a repeated game, whereby if the state expropriates too much, agents will stop investing. Acemoglu (2003a,b) shows that there are generally limits to how useful these trigger strategies will be in a political context.

**Result 1** In the model outlined above with only debt contracts, there exists a threshold for legal costs  $\bar{C}^d(P)$  such that if  $C^d < \bar{C}^d(P)$ , changes in legal costs have no effect on equilibrium investment. If  $C^d$  rises above  $\bar{C}^d(P)$ , the credit market collapses and investment falls to zero. Greater constraint on elite expropriation,  $P$ , reduces the likelihood of credit market collapse, i.e., increases  $\bar{C}^d(P)$ . Moreover, as long as  $C^d < \bar{C}^d(P)$ , a higher  $P$  raises investment.

Figure 1 is a simple diagrammatic representation of the equilibrium, with the legal costs of debt contract enforcement, i.e., legal formalism,  $C^d$  on the vertical axis and constraint on elite expropriation,  $P$ , on the horizontal axis. Above the line  $\bar{C}^d(P)$ , the credit market collapses because the costs of contract enforcement are too high. In this region a higher value of  $P$  does not affect investment, since investment is already 0. Below the  $\bar{C}^d(P)$  line the credit market exists and a higher value of  $P$  raises investment directly. In this region, private contracting undoes the effects of higher legal costs, so  $C^d$  has no effect on investment. A greater  $C^d$  reduces investment only when it induces the economy to cross from above to below the threshold line  $\bar{C}^d(P)$ .

## 2.3 Equity Contracts

To introduce equity contracts in the simplest possible way, we assume that in stage 2 of the above timing of events, lenders can decide between a debt contract as described above, or an equity contract where they will lend 1 unit in return for a fraction  $s$  of the project returns. With equity contracts, raising 1 unit of funds costs  $1 + m^e$ , where  $m^e \leq m^d$ . This implies that, everything else equal, equity finance is cheaper, for example because money can be raised from a broader group of savers, or because equity finance is administratively less costly or makes better use of market information (e.g., Holmstrom and Tirole, 1993).

The costs of court action when the producer reneges on her equity payments are different from the legal costs involved in enforcing debt contracts, and are equal to  $C^e \geq C^d$ , so that settling disputes related to equity are more costly. This might be, for example, because when the producer fails to repay debt, the lender may be able to foreclose on her assets. In contrast, shareholders do not have access to this option when the producer does not pay dividends, making the enforcement of equity contracts more costly for lenders (see, e.g., Hart, 1995).

The analysis in the pure equity case is parallel to the debt case, and we can easily see

that when the producer reneges on the payment, the lender will file a complaint only if:  $\theta_j \leq sa - C^e$ . The equilibrium equity share given to lenders will be:

$$s = \frac{C^e + \sqrt{(C^e)^2 + 4(1 + m^e)F(P)^{-1}}}{2a}, \quad (7)$$

and naturally, we need  $s \leq 1$ , which gives a condition similar to before for the credit market to function, i.e.,

$$C^e \leq \bar{C}^e(P). \quad (8)$$

Once again, as long as this condition is satisfied, we have the utility of producer  $j$  as  $U_j(e_j) = F(P)a - 1 - m^e - e_j$ , and consequently, aggregate investment is

$$I = G[F(P)a - 1 - m^e], \quad (9)$$

which, like (6), does not depend on legal rules  $C^e$ , as long as (8) holds. This gives us:

**Result 2** In the model outlined above with only equity contracts, there exists a threshold for legal costs  $\bar{C}^e(P)$  such that if  $C^e < \bar{C}^e(P)$ , changes in legal costs have no effect on equilibrium investment. If  $C^e$  rises above  $\bar{C}^e(P)$ , the equity market collapses and investment falls to zero. Greater  $P$  reduces the likelihood of equity market collapse (i.e., increases  $\bar{C}^e(P)$ ), and as long as  $C^e < \bar{C}^e(P)$ , it raises investment.

It is also straightforward to characterize the equilibrium when both debt and equity contracts are available. In this case, competition between lenders ensures that the contract form maximizing the utility of producers will prevail. Thus, we need to calculate the utilities of producers with debt and equity contracts. As long as (4) and (8) are satisfied, credit markets will function both with debt and equity contracts, and equity contracts will prevail as long as  $m^e < m^d$ , i.e., as long as equity is the more efficient form of financial intermediation. However, since  $C^e$  may be greater than  $C^d$ , an interesting configuration arises when (4) holds, but (8) fails to hold. In this case, the equilibrium will feature debt contracts even if  $m^e < m^d$ . We summarize this discussion as follows:

**Result 3** If both (4) and (8) are satisfied, the unique equilibrium involves only equity contracts when  $m^e < m^d$ . If (4) holds and (8) fails to hold, the unique equilibrium involves only debt contracts.

Now in light of these results, let us compare two economies that have the same  $P$ , but one has a higher legal cost of enforcing both debt and equity contracts, corresponding to high values of  $C^e$  and  $C^d$ , and the other has low values of  $C^e$  and  $C^d$ . If (8) holds in the low-enforcement-cost economy, but not in the high-cost one, and if (4) holds in both, then we will observe debt contracts in the high-cost economy and equity contracts in the low-cost economy. Despite this sharp difference in the form of financial intermediation, differences in total credit and investment may be small: total investment is  $G[F(P)a - 1 - m^d]$  in the high-cost economy and  $G[F(P)a - 1 - m^e]$  in the low-cost one. If  $m^e \approx m^d$ , investment levels will not differ much in the two economies. This configuration provides a potential interpretation for our empirical results where economies with different legal rules will exhibit large differences in the form of financial intermediation, particularly the use of equity, but only small differences in levels of long-run income, investment, and total credit (debt plus equity). Therefore, in this model, legal costs of private contract enforcement can influence the form of financial intermediation at the same time as having a relatively small effect on investment and output. In contrast, the risk of expropriation by the state and political elites typically has a major effect on investment output.

### 3 Empirical Strategy and Data

#### 3.1 Basic Specification

We are interested in investigating the separate effects of contracting institutions and property rights institutions. Ignoring nonlinearities, the economic relationship we are interested in identifying can be written as:

$$Y_c = \alpha \cdot F_c + \beta \cdot I_c + Z_c' \cdot \gamma_0 + \varepsilon_c \quad (10)$$

where  $Y_c$  is the outcome of interest for country  $c$ , for example, per capita income, the investment rate, or the level of financial development.  $F_c$  is a measure of legal formalism, which captures the legal costs of contract enforcement,  $I_c$  is a measure of property rights institutions, and  $Z_c$  is a set of other controls.  $\alpha$  and  $\beta$  are the parameters of interest, and  $\gamma_0$  is a vector capturing effects of the control variables in  $Z_c$ .<sup>17</sup>

---

<sup>17</sup>In addition, we have also investigated whether there is an interaction between property rights and contracting institutions by adding interaction terms such as  $F_c \cdot I_c$ , and whether there are significant nonlinearities by adding higher-order terms in  $F_c$  and  $I_c$ . We did not find any evidence for significant interactions or nonlinearities, so we do not report these results to save space.

The four outcomes we focus on are: the level of GDP per capita, which is a good measure of long-run growth since around 1750 there were only minor differences in income per capita across countries (Acemoglu, Johnson, and Robinson, 2002); the ratio of investment to GDP, which is the best measure of whether a society is able to channel money into productive investments; the amount of private credit as a percent of GDP, as a measure of finance provided through the banking sector and trade credit; and stock market capitalization as a percent of GDP, which provides a measure of equity finance. In our baseline regressions, we choose outcomes from the 1990s—this choice is dictated by data availability and our desire to start the analysis when the countries for which we have institutions data are all independent states.

For  $I_c$  we use two measures. Our base measure is “protection against expropriation” by government, averaged over 1985-95, from Political Risk Services. These data were first used in economics by Knack and Keefer (1995), and are also the main measure used in Acemoglu, Johnson, and Robinson (2001). Political Risk Services reports a value between 0 and 10 for each country and year, with 0 indicating the lowest protection against expropriation. The second measure is “constraint on the executive” from the Polity IV dataset, capturing the degree of constraints on politicians and politically powerful elites (Gurr, 1997).<sup>18</sup> This measure ranges from 1 to 7, where a higher score indicates greater constraints. In our main regressions, we use the average of the values between 1990 and 2000 inclusive.<sup>19</sup>

As already noted, we proxy for contracting institutions with the degree of legal formalism,  $F_c$ , using measures constructed by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). The details of these variables are discussed in Section 3.4 below.

## 3.2 Empirical Strategy

The simplest strategy is to estimate the model in equation (10) using ordinary least squares (OLS) regression. There are two distinct problems with this strategy. First, both contracting and property rights institutions are endogenous, so we may be capturing reverse causality, or the effect of some omitted characteristics (e.g., geography, religion, or other variables). Second, both variables are measured with error, so there may be a down-

---

<sup>18</sup>The latest version of Polity IV is available on the web at <http://www.cidcm.umd.edu/inscr/polity/>

<sup>19</sup>Where a year is missing or the coding indicates an interregnum of some kind (e.g., civil war), we ignore that year for the purposes of constructing the average. We also checked the robustness of our results using constraint on the executive in 1990, in 1970, and its average value in 1950, 1960, and 1970.



ward attenuation bias. More important, if contracting and property rights institutions are correlated, the effect of the institution that is measured with greater error will load on to the other variable.

Both of these concerns imply that OLS regressions will give results that do not correspond to the causal effect of contracting and property rights institutions on economic outcomes—upward or downward bias is possible. So we would like to estimate equation (10) using Two-Stage Least Squares (2SLS) with distinct and plausible instruments for legal formalism and property rights. These instruments should be correlated with the endogenous regressors but orthogonal to any other omitted characteristics (i.e., uncorrelated with the outcomes of interest through any channel other than their effect via the endogenous regressors).<sup>20</sup>

In this paper, we pursue a multiple IV strategy to identify the effects of interest. The two first-stages are:

$$\begin{aligned} F_c &= \delta_1 \cdot L_c + \eta_1 \cdot M_c + Z_c' \cdot \gamma_1 + u_{1c} \\ I_c &= \delta_2 \cdot L_c + \eta_2 \cdot M_c + Z_c' \cdot \gamma_2 + u_{2c} \end{aligned} \tag{11}$$

where  $M_c$  is either the log potential mortality rate of European settlers or log of the indigenous population density in 1500, and conceptually corresponds to the instrument for property rights institutions. We explain these measures in Section 3.3 below.  $L_c$  is a dummy for English legal origin (or equivalently, whether or not the country was a British colony) and is the instrument for legal formalism (i.e., contracting institutions). This is discussed further in Section 3.4. If these instruments are valid, the IV strategy will solve the endogeneity, the omitted variables bias, and the measurement error problems, and we can estimate the  $\alpha$  and  $\beta$  parameters consistently.

---

<sup>20</sup>A potential concern is that legal origin may affect economic outcomes through channels other than legal formalism (see, for example, La Porta et al., 1998, Glaeser and Shleifer, 2002, and Mahoney, 2001). In terms of our framework, in particular, equations (10) and (11), this would amount to  $Cov(\varepsilon_c, L_c) \neq 0$ , whereas the 2SLS identifying assumption is that this covariance should be 0. Since the existing literature suggests that English legal origin should have a positive effect on the economic outcomes studied here, we expect that, if anything,  $Cov(\varepsilon_c, L_c) \geq 0$ , and in this case, the estimate of the impact of legal formalism on economic outcomes,  $\alpha$ , will be biased upwards, and our results can be interpreted as potential upper bounds on the importance of legal formalism and contracting institutions. The results reported in Appendix Table A3 do not show any evidence of a major effect of legal origin on the outcome variables here.

### 3.3 Settler Mortality and Population Density

Our first instrument for property rights institutions is settler mortality in countries that were colonized by European nations between 1500 and 1900.<sup>21</sup> Acemoglu, Johnson, and Robinson (2001) documented that European colonization strategies had radically different implications for economic development. Places prospered when Europeans set up institutions that protected private property rights and placed effective constraints on politicians and powerful elites. In contrast, areas stagnated or grew only slowly when Europeans established—or took over existing—extractive institutions.

What determined the Europeans' colonization strategy? There were two key factors. The first was the disease environment facing Europeans. Where the disease environment was favorable for European settlements, they migrated in large numbers and developed political and economic institutions very similar to, or even substantially better than, the contemporary institutions in Europe. These settler colonies, such as the United States, Canada, Australia, or New Zealand, rapidly developed and maintained good institutions, with tight constraints on politicians and elites, and secure property rights. In many other colonies, for example in sub-Saharan Africa, South Asia, and Central America, Europeans faced high or very high mortality rates (up to 50 percent mortality per year in some places) and settlement was not feasible. In these areas, the colonizers were much more likely to develop extractive institutions, used mostly to exploit the native population for the benefit of European colonizers. After independence the beneficiaries of extraction changed, and the form of extraction has evolved over time, but countries that had rapacious rule under colonialism typically have worse property rights institutions today. Based on this reasoning, we will use potential European settler mortality rates as an instrument for current institutions (see Acemoglu, Johnson, and Robinson, 2001, for more discussion).<sup>22</sup>

The second determinant of European colonization strategy was initial indigenous pop-

---

<sup>21</sup>We use the series constructed by Acemoglu, Johnson, and Robinson (2001) based primarily on Curtin (1989, 1998) and Gutierrez (1986).

<sup>22</sup>Malaria and yellow fever caused the majority of European deaths during the early colonization period. Although these diseases were fatal to Europeans, they had much less effect on indigenous adults with acquired or inherited immunity. These diseases are therefore unlikely to be the reason why many countries in Africa and Asia are poor today. More generally, when we measure the effect of institutions correctly, there is no evidence that the large income differences between former colonies are due to geography, religion, or culture (for more details of this analysis, see Acemoglu, Johnson and Robinson, 2001, 2002). These results are robust to alternative measures of outcomes, institutions, and control variables (Acemoglu, Johnson and Robinson, 2001, and Easterly and Levine, 2003).

ulation density. Where this was high, Europeans were more likely to “capture” the local population and put it to work in some form of forced labor system. Where initial population density was low, Europeans were more likely settle themselves, and less likely to develop extractive institutions even when they did not settle. Acemoglu, Johnson, and Robinson (2002) provide evidence that, for countries colonized by European powers, there is a strong negative relationship between population density in 1500 and income per capita today. This relationship is due to the fact that former colonies with greater population density in 1500 had, and still have, worse property rights institutions. The density of indigenous population per square kilometer in 1500 is therefore an appealing alternative instrument. Because settler mortality and population density in 1500 capture different sources of variation in practice (the correlation between the two measures is 0.4), but should have similar effects on property rights, using these two instruments separately is a good check on our results.

### 3.4 Legal Origin and Legal Formalism

The fundamental idea in the line of research of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) is that countries have distinct “legal origins” and these matter for legal, economic, and financial outcomes.<sup>23</sup> La Porta et al. (1998) draw the strongest distinction between the two great legal traditions: “Common Law” countries that were part of the UK or the British Empire, and “Civil Law” countries where a French, German, or Scandinavian legal system has prevailed.

Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) offer two measures for the operation of contract enforcement through the legal system. These quantify the “formal” procedures associated with collecting on a bounced check and evicting a tenant for non-payment of rent. In both cases, the defendant has no justification and avoids voluntary payment. The underlying idea is that a pure “neighbors” model, in which disputes are resolved informally by disinterested local third parties based on fairness criteria, would quickly rule in favor of the plaintiff (see Shapiro, 1981, and also Ellickson, 1991, for how a real community works under such a model). More legal formalism creates additional costs of enforcing the contract implied by the check or the tenancy agreement. Djankov et al. (2003) measure the extent of these costs—legal formalism—by surveying expert opinions

---

<sup>23</sup>See Glaeser and Shleifer (2002) on the origins of these distinct “legal families”.

of lawyers in an international network of law firms in 109 countries. They then construct indices that are comparable across countries.

A legal system is more formal, in their metric, if it involves professional judges and lawyers, written rather than oral arguments, the legal justification of claims and judges' decisions, the regulation of evidence, superior review of first-instance judgment, other “engagement formalities”, and more required independent actions. Djankov et al. (2003) also present evidence that a greater degree of legal formalism raises the cost of adjudication and creates delay in the resolution of disputes.

As an extension of the Djankov et al. (2003) study, the World Bank subsequently collected legal formalism data on more countries, but only for the “check” measure. We use this measure in our base regressions, as it gives 9 or 10 more observations for former colonies for which we have all the other necessary data.<sup>24</sup> We also confirm all our results using the eviction measure directly from Djankov et al. (2003).

Whether a country has a common law or civil law system is an important determinant of legal formalism. In general, the legal origin of a country may be a choice, but for former colonies there are good reasons to regard this as exogenous—the British imposed common law systems on the country they colonized, while countries colonized by other European powers have civil law systems. We therefore instrument legal formalism with legal origin in the sample of former European colonies.<sup>25</sup> As we will see in greater detail below, colonies with English legal origin have less formalism than those that were colonized by other European powers and now have some version of civil law.

## 4 The Samples and Descriptive Statistics

### 4.1 Samples

Our basic sample is that of former European colonies. For all these countries we have information on their legal origin and an estimate of their population density in 1500 (from Acemoglu et al., 2002). From smaller subsets of countries, we also have data for various measures of institutions, for potential settler mortality rates (from Acemoglu et al., 2001) and for measures of legal formalism (from Djankov et al., 2003).

---

<sup>24</sup>The extended check measure data were kindly provided by Simeon Djankov in a private communication.

<sup>25</sup>Djankov et al (2003) relate legal formalism to legal origin in the whole world sample and show that legal origin explains about 40 percent of the variation in legal formalism.

In total, there are 42 common law “English legal origin” countries in the extended Djankov et al. (2003) sample, of which almost all are former European colonies.<sup>26</sup> In our base sample, we have 30 English legal origin countries, and we lose additional observations when we use the settler mortality instrument. There are 47 civil law “French legal origin” countries in the extended Djankov et al. (2003) sample, of which 35 are former European colonies.<sup>27</sup>

## 4.2 Descriptive Statistics

Table 1 summarizes our data. Column 1 reports mean values and standard deviations for all countries on which we have data. Column 2 shows our data for the former colonies of European powers. In all cases, the values for former colonies are quite close (within half a standard deviation or less) of the values for all countries. Column 3 reports mean values for former British colonies (i.e., common law countries), and columns 4 through 6 break these down into former British colonies with low, medium, and high settler mortality (with the break points given by values that divide all excolonies roughly into thirds). Columns 7 through 10 provide parallel data for former colonies with French legal origin.

The first two rows in Table 1 report our measures of property rights institutions: protection against expropriation and constraint on the executive. Rows 3 and 4 report the two measures of legal formalism: the “check measure” and the “eviction measure”. Former colonies with lower settler mortality and those with an English legal origin have, on average, better property rights institutions and lower legal formalism.

Rows 5, 6, 7, and 8 describe our four main dependent variables. Row 5 reports log of GDP per capita (in PPP terms) in 1995.<sup>28</sup> We can see a clear relationship between settler

---

<sup>26</sup>The exceptions are: Britain and Ireland in Europe; Thailand, which was never colonized; and Israel, Bahrain, and the United Arab Emirates, which were formerly part of the Ottoman Empire and administered by Britain under League of Nations mandates after the end of World War I.

We do not treat former League of Nations mandate countries as excolonies for three reasons. First, European control was relatively short-lived and did not generally have major transformative effects on political institutions. Second, because these mandates were granted in the twentieth century, European powers were already moving towards decolonization or at least minimal control, rather than the previous forms of colonial control for either settlement or extraction. Third, by the early twentieth century, advances in medicine meant that settler mortality was much more even across countries, so our data on this from earlier centuries do not allow construction of a valid instrument for the League of Nations mandate countries.

<sup>27</sup>The exceptions, in addition to France, are Belgium, Greece, Italy, Luxembourg, Malta, the Netherlands, Portugal, and Spain in Europe, and Jordan, Kuwait, and Turkey in the former Ottoman Empire.

<sup>28</sup>These data are from the World Bank (2003). The results are robust to using GDP per capita data from other years or from the Summers-Heston data set.

mortality and income per capita: former colonies with higher settler mortality rates have substantially lower income per capita today. In addition, a comparison of columns 3 and 7 shows that English legal origin colonies have higher average income per capita than French legal origin colonies.

Row 6 reports our data on the ratio of private investment to GDP, measured in current prices and averaged over the 1990s (from Heston et al. 2002). Investment ratios are higher in former colonies with lower settler mortality rates, and higher in former British colonies.

In our baseline regressions we use two standard measures of financial development: the total amount of credit to the private sector in the economy as a percent of GDP in 1998, shown in row 7; and stock market capitalization, shown in row 8.<sup>29</sup> Former colonies with lower settler mortality rates and an English legal origin have, on average, higher levels of credit to the private sector.

For the size of the stock market, we use average stock market capitalization as a percent of GDP, provided by Beck et al. (2003a).<sup>30</sup> Former colonies with lower settler mortality rates and English legal origin have much higher stock market capitalizations.

Below we will also look at the barriers to entry for new businesses, particularly the official regulations required for registration as measured by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002). There are two main measures (rows 9 and 10 in Table 1). The first is the number of formal procedures needed to register a business. The second measure is the cost of registration. This is calculated by Djankov et al. (2002) as a percentage of annual GDP per capita. A higher cost is obviously a greater burden on potential entrepreneurs. French legal origin former colonies and those with higher settler mortality rates have more procedures required for registering a new business and the overall cost of registering a business is higher as a percent of GDP per capita.

---

<sup>29</sup>Our base measure for banking system development is credit to the private sector, from the World Bank (2003). This measure refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. In the choice of this and other measures, we are following the financial development literature; see, for example, Levine (1997), Levine and King (1993), Rajan and Zingales (1998), and Levine (2003).

<sup>30</sup>This measure corresponds to the total value of outstanding shares as a percent of GDP. The series is averaged over 1990-95, which is appealing since it excludes the large run-up in global stock markets in the late 1990s (as well as the large, but mostly temporary, effects of the Asian financial crisis).

## 5 Results

### 5.1 First-Stage Results

Our regression analysis disentangles the effects of legal origin acting through legal formalism, and colonization strategy acting through property rights institutions. We start by showing the first-stage relationships in Figures 2 through 4.

Figure 2, upper left corner, plots on the y-axis the residuals from regressing average protection against expropriation on English legal origin, against on the x-axis the residuals from regressing log settler mortality on English legal origin. This is a visual representation of the strong first-stage relationship between the settler mortality instrument and property rights institutions today. The upper right corner of Figure 2 shows that, after partialing out the effects of log settler mortality, there is a substantially weaker but still positive relationship between protection against expropriation and English legal origin. As our regression analysis below will illustrate, however, the relationship between protection against expropriation and English legal origin is generally not robust.

Figure 2, lower right, plots the residuals from regressing the check measure of legal formalism on log settler mortality, against the residuals from regressing English legal origin on log settler mortality. This shows that there is also a strong relationship between this measure of contracting institutions and legal origin. Figure 2, lower left, depicts a weaker (and statistically insignificant) relationship between the check measure of legal formalism and log settler mortality.

Figure 3 shows a similar pattern using constraint on the executive and the eviction measure of legal formalism as the dependent variables. In this case the first stages are even more separable: log settler mortality has a strong effect on this measure of property rights institutions and no effect on this measure of contracting institutions, while English legal origin here affects contracting institutions but not property rights institutions. Figure 4 presents the first-stage results for protection against expropriation and the check measure of legal formalism with log population density in 1500 as the instrument for property rights institutions; these show a similar pattern to that in Figure 2.

### 5.2 Univariate Regressions

To provide a benchmark, Table 2 reports results just using legal formalism as the right-hand side variable. In Panel A the dependent variable is log GDP per capita in 1995.

Columns 1 and 2 report OLS regressions using the check measure of legal formalism. Column 1 uses data from all 109 countries for which we have GDP data and the check measure of legal formalism; column 2 limits this to just the 65 countries that were colonized by European powers and for which we have data on legal formalism.

There is a significant coefficient on the check measure of legal formalism in the basic OLS regression—a one standard deviation increase in legal formalism is associated with over a 30 percent decline in GDP per capita today. When we instrument for legal formalism with legal origin, there is a strong first stage ( $R^2=0.58$ ), but in the second stage the coefficient becomes insignificant, though it remains quantitatively large; the point estimate of -0.18 in column 3 implies that a one standard deviation increase in legal formalism will reduce log GDP per capita by 0.20 of a standard deviation.<sup>31</sup> In columns 4, 5, and 6, the eviction measure of legal formalism is not significant in either OLS or IV specifications, and the size of the effect is about 1/4 of that implied by column 3. In all the IV specifications of Table 2, the first stage  $R^2$  is in the range 0.56-0.61.<sup>32</sup>

In Panel B, the dependent variable is the average investment-GDP ratio in the 1990s. There is a significant negative coefficient on legal formalism in the OLS specifications of columns 1 and 2. The coefficient of -1.77 in column 3 is significant at the 10 percent level (but not at 5 percent) and implies that a one standard deviation increase in legal formalism would reduce the investment-GDP ratio by 0.3 of a standard deviation. In columns 4, 5, and 6, the eviction measure of legal formalism is both insignificant and small. The size of the effect implied by the IV coefficient in column 6 is about 1/2 of the effect suggested by column 3. Since the first stages in this and subsequent panels are almost identical to those in Panel A, we do not report them to save space.

Panels C and D show significant results for both measures of legal formalism. In Panel C the dependent variable is credit to the private sector as a percent of GDP in 1998. The coefficient is -0.14 in column 2 (OLS) and -0.13 in column 3 (IV). This is a large effect—it implies that a one standard deviation increase in legal formalism causes about a half standard deviation fall in the credit to GDP ratio. The results for the eviction measure

---

<sup>31</sup>A one standard deviation change in the check measure of legal formalism in the former colonies sample is 1.24, thus the estimate implies a change of 0.22, which is about 20 percent of the standard deviation of log GDP, which is approximately 1 for former colonies.

<sup>32</sup>The difference between the results using the check and the eviction measures is not due to differences in the samples. When we run regressions with the check measure restricting the sample only to those countries that have data on the eviction measure, we get very similar results to those using the full check measure sample.



of legal formalism, in columns 4, 5, and 6 of Panel B, are similar (though slightly less significant).

Panel D reports the same set of specifications now with stock market capitalization as a percent of GDP (averaged over 1990-95) as the dependent variable. Both legal formalism measures are significant determinants of stock market capitalization, and the OLS and IV results are quite similar for the check measure (columns 2 and 3), while the IV coefficient is about twice the size of the OLS coefficient for the eviction measure (columns 5 and 6). A one standard deviation increase in either legal formalism measure implies a half standard deviation decline in stock market capitalization.

Table 3 reports parallel univariate specifications using our measures for property rights institutions, protection against expropriation and constraint on the executive, as the independent variables, and with settler mortality and log population density in 1500 as the instruments. In all panels of Table 3 we only include a country in the excolonies regressions if we have data on both instruments—this ensures that the sample size, for example in columns 2, 3, and 4, is the same, so the coefficients are directly comparable. This restriction does not affect the results, and in subsequent tables, when we use log population density as instrument, we will report results with the full set of countries for which we have data on that instrument.

Panel A shows a strong first stage from log settler mortality to property rights institutions, with an  $R^2$  of 0.23 in column 3. The first-stage results are almost identical in all specifications, so to save space we do not repeat them in the other panels. In all panels the IV coefficient using log settler mortality is approximately double the OLS coefficient. This is similar to the results in Acemoglu, Johnson, and Robinson (2001), and suggests that the OLS estimates are significantly biased downwards because of attenuation. This is not surprising: since the available measures of property rights institutions correspond quite poorly to the concepts we would like to measure, there is a form of measurement error, creating downward attenuation bias. The instrumental variables strategy corrects for this type of attenuation bias. The first-stage relationship between log population density in 1500 and protection against expropriation is a bit weaker, with an  $R^2$  of 0.17 in column 4. For this instrument, the IV coefficient is also typically twice the OLS coefficient.

Property rights institutions have a large effect on income per capita. In the IV specification of Panel A, the coefficients of 1.05 and 1.07 in columns 3 and 4 imply that a one standard deviation improvement in this measure of institutions leads to about a 1.5

standard deviation increase in GDP per capita. The estimated effect of constraint on the executive, in column 7, is similar.

Property rights also have a large effect on the investment to GDP ratio, on the private credit to GDP ratio, and on stock market development. For example, in column 3 of Panel B, the coefficient of 5.5 implies that a one standard deviation improvement in property rights causes a 1.1 standard deviation increase in the investment-GDP ratio. The estimates in column 3 of Panels C and D, imply that a one standard deviation improvement in property rights would cause a 1.5 standard deviation increase in the credit to GDP ratio and a 1.2 standard deviation increase in stock market capitalization. The results using constraint on the executive are qualitatively and quantitatively similar.

Taken together, Tables 2 and 3 show strong effects of property rights institutions on GDP per capita, investment, credit, and stock market development both in univariate OLS and IV regressions. They also show strong effects of contracting institutions (proxied by legal formalism) on credit and stock market development, with more limited effects on GDP per capita and the investment-GDP ratio. We next turn to investigating how these results change when the two sets of variables are included simultaneously.

## 6 Contracting vs. Property Rights Institutions

### 6.1 Main Results

Tables 4, 5, 6 and 7 report our main results. In all four tables, columns 1 through 4 use protection against expropriation as the measure of property rights institutions and columns 5 through 8 use constraint on the executive. Columns 1, 2, 5, and 6 use the check measure of legal formalism, and columns 3, 4, 7, and 8 include results with the eviction measure of legal formalism. For each specification we present a pair of results: OLS in odd-numbered columns and IV in even-numbered columns. For the IV specifications, the top panel reports the second stage and the other panels report the first stages for the measure of property rights institutions and the measure of legal formalism in that order. All four tables use log settler mortality rates as the instrument for property rights institutions, and Tables A4, A5, A6 and A7 in the Appendix have an identical structure, but use log population density in 1500 as the instrument.<sup>33</sup>

---

<sup>33</sup>In addition, Appendix Table A2 reports regressions in which the dependent variable is economic growth between 1970 and 1995. The results are similar to Table 4, where log GDP per capita is the

The first-stage regressions in all eight tables are quite similar and consistent with the patterns shown in Figures 2 through 4. In the first stage for property rights institutions, using either measure, there is a strong robust effect of log settler mortality—the coefficient is between -0.65 and -0.92, and typically four times larger than the standard error. English legal origin is positive and significant in the specification of column 2, but in column 4 it is significant only when we use log population density as the instrument. When we use constraint on the executive as the measure of property rights institutions (columns 6 and 8), the sign on English legal origin is insignificant and usually negative. Overall, the way in which countries were colonized, but not who colonized them, is a robust determinant of property rights institutions.

In the first stage for legal formalism, using either the check or eviction measure, English legal origin has a strong robust negative effect. In contrast, log settler mortality and log population density in 1500 are not significant in any specification. Who colonized, but not the way in which countries were colonized, appears to affect the extent of formalism in legal procedures.

These strong first-stage results enable us to disentangle the effect of property rights and contracting institutions. In column 2 of Table 4, the coefficient on protection against expropriation is 0.95. This implies that a one standard deviation improvement in property rights will lead to a 1.4 standard deviation increase in GDP per capita. Similarly, the results in column 6 imply that a one standard deviation increase in constraint on the executive causes a two standard deviation increase in GDP per capita. In contrast, the coefficient on legal formalism is often not significant, and when it is significant, e.g., columns 2 and 4, it has the “wrong” sign—countries with more formalism actually have higher GDP per capita. Note the change from Table 2, where the coefficient on legal formalism, while not always significant, was negative and quite large (e.g., -0.18 in column 2 of that table). This change in the implied effect of legal formalism on long-run growth implies that in OLS or in regressions that do not control for property rights institutions, the importance of contracting institutions is exaggerated because they capture some of the differences in protection of property rights.

Appendix Table A4, which uses log population density in 1500 in place of log settler mortality, has between 6 and 9 more observations, and shows results consistent with those in Table 4. For example, the estimated coefficient for protection against expropriation in  

---

outcome of interest.

column 2 is 1.09 (s.e. 0.22), compared with 0.95 (s.e. 0.16) in Table 4, while in column 4 it is 0.97 (s.e. 0.18) compared with 1.53 (s.e. 0.25) in Table 4. The first-stage pattern is also similar in the two tables.

Table 5 shows a robust positive effect of property rights institutions on the investment to GDP ratio. According to the estimate in column 2, a one standard deviation strengthening of property rights causes a 0.95 standard deviation increase in the investment to GDP ratio. In contrast, there is no significant effect of legal formalism on the investment-GDP ratio in any specification. The coefficient on legal formalism is negative and small in columns 5 through 8, and actually positive in columns 1 through 4. The results in Appendix Table A5 are similar.

Table 6 shows a strong effect of property rights institutions on credit to the private sector. The coefficient of 0.28 in column 2 implies that a one standard deviation increase in protection against expropriation causes a 1.2 standard deviation increase in the credit to GDP ratio. The coefficient of 0.27 in column 6 implies that a one standard deviation improvement in constraint on the executive causes a 1.61 standard deviation increase in credit.

Once we control for the effect of property rights institutions with our IV strategy, legal formalism is no longer a significant determinant of credit—it is insignificant in all the IV specifications of Table 6. The coefficient on legal formalism is actually positive in columns 2 and 4. When it is negative, it is highly insignificant and small, e.g., the coefficient of -0.08 in column 6 (down from the univariate estimate of -0.13 in Table 2).

Appendix Table A6 reports parallel results using log population density in 1500 as an instrument in place of settler mortality. The coefficients on the property rights measures are now slightly lower, but the effects are still large and highly significant (e.g., the coefficient of 0.25 in column 2 implies a one standard deviation increase in protection against expropriation causes about a one standard deviation increase in credit to the private sector). The coefficients on the legal formalism measures are consistently small and insignificant.

The pattern in Table 7, where we look at stock market capitalization, is slightly different. The effect of a one standard deviation increase in protection against expropriation (using the coefficient of 0.21 in column 2) is about 0.8 of a standard deviation increase in stock market capitalization. The coefficient of 0.2 in column 6 implies that a one standard deviation improvement in constraint on the executive would raise stock market

capitalization by one standard deviation. With protection against expropriation in the regression, the coefficient on legal formalism is negative but not significant. In contrast, with constraint on the executive as the measure of property rights, there is a statistically significant negative effect of legal formalism on stock market development. For example, the estimate in column 6,  $-0.16$  (s.e.  $0.07$ ) implies that a one standard deviation increase in legal formalism would reduce stock market capitalization by  $0.2$  of a standard deviation. So the effect of contracting institutions, even when significant, is substantially smaller than that of property rights institutions. The results in Appendix Table A7, with log population density in 1500 as the instrument, are similar. There is a strong effect of property rights institutions, and a smaller effect of legal formalism that is significant only when competing against constraint on the executive.

Overall, the results in this section suggest that property rights institutions have a first-order effect on income per capita, the ratio of investment to GDP, the level of credit, and stock market development. In contrast, legal formalism appears to have an effect only on stock market development; for the other outcomes, the effect is not significantly different from zero. Moreover, for all variables, the effect of legal formalism is quantitatively much smaller than the effect of property rights institutions. The rest of this section shows that this pattern is robust and attempts to develop a potential explanation.<sup>34</sup>

## 6.2 Alternative Samples

Table 8 reruns our basic regressions using alternative samples. To save space, it reports the first-stage regressions in full just in Panel A; the first stages for Panel B are almost identical. All columns use protection against expropriation, instrumented with log settler mortality. Results using constraint on the executive as the measure of property rights or log population density in 1500 as the instrument are very similar, but not reported to

---

<sup>34</sup>In addition, Appendix Table A3 reports partial reduced-form specifications in which we instrument for property rights (using settler mortality in columns 1 through 6 and log population density in columns 7 through 12), but legal origin is entered directly. The specifications are useful since they do not restrict the effect of legal origin to work solely through legal formalism, and are informative on whether legal origin has a direct effect on the economic outcomes studied here. The results are similar to our baseline results in Tables 4 through 7, but now English legal origin has a negative (i.e., wrong signed) and significant effect on GDP per capita and does not appear to be a significant determinant of stock market capitalization.

We have also experimented with other measures of credit and financial development, including the same measures as in Tables 6 and 7 but calculated over different periods, measures of overall size of financial system (sum of bank credit and stock market capitalization), M2 over GDP, and liquid liabilities over GDP. The results are similar to those in Tables 6 and 7, and are available upon request.

save space.

In columns 1 and 5, we restrict the sample to just common law countries (i.e., former British colonies) and in columns 2 and 6 to just French legal origin countries. Here we drop legal formalism, and examine whether there is an effect of property rights institutions within each legal “family”. There is a strong first stage for log settler mortality in both specifications, with a slightly larger coefficient for common law countries than for French legal origin countries and a much higher  $R^2$  (e.g.,  $R^2$  of 0.30 vs. 0.07, comparing columns 1 and 2 of Panel A). This result suggests that much of the considerable variation in institutions within the set of common law countries can be explained by the colonization strategy of European powers. In the second stage there is a large significant effect of property rights institutions on GDP per capita for both legal systems (with a larger, but less precisely estimated, coefficient for French legal origin countries). The effect of property rights on income per capita is approximately the same within “legal families” as it is across all excolonies (compare with Table 4). The results for the investment to GDP ratio are similar, while for credit and stock market development there is a stronger effect among common law countries

Columns 3 and 7 drop the four “neo-Europes,” i.e., the richest former colonies with the closest geographic conditions to Western Europe (Crosby, 1972): Australia, Canada, New Zealand, and the USA. This is useful to show that the results are not driven simply by the contrast between these four countries and other former European colonies. Without these countries, the coefficient for protection against expropriation goes up slightly in the GDP per capita, investment, and private credit regressions and increases by about 50% for stock market capitalization. Legal formalism shows the same pattern as before; it is significant only for stock market capitalization. Legal formalism is also almost significant for log GDP per capita, but with the wrong sign.

Columns 4 and 8 in Panel A report the GDP per capita and investment-GDP ratio regressions just for countries above median world income, to establish that the results are not driven simply by the comparison of rich and poor countries. The results are close to those in Table 4.

Although there are no significant outliers in the GDP per capita and investment to GDP ratio data used here, there are some major outliers in the financial development outcomes. Columns 4 and 8 in Panel B drop outliers from the credit and stock market capitalization regressions respectively. For credit, the outliers are Malaysia, South Africa,

and the United States, and for the stock market they are Malaysia, Singapore, and South Africa. The results for property rights institutions change little; the coefficient falls from 0.28 (column 2 in Table 6) to 0.24 (column 4, Panel B, Table 8); and from 0.21 (column 2 in Table 7) to 0.14 (column 8, Panel B, Table 8). In both cases the standard error also declines, so the effect remains highly significant. Notably, once these outliers are dropped, legal formalism is no longer a significant determinant of stock market development.

### 6.3 Additional Control Variables

Table 9 includes with three important control variables from the literature on long-run growth and financial development.<sup>35</sup> Columns 1, 4, 7 and 10 control for religion; columns 2, 5, 8 and 11 control for latitude, and columns 3, 6, 9 and 12 control for log average inflation over 1970-97. In all columns, we include these control variables in the first-stage regressions but do not report their coefficients to save space; the first-stage results are very similar to those in earlier tables. To save space, Table 9 only reports results using protection against expropriation to measure property rights and log settler mortality as the instrument. However, the results are similar if we use constraint on the executive to measure property rights or log population density as the instrument.

A number of recent papers have taken religion seriously as a determinant of financial development (e.g., Stulz and Williamson, 2003). We use the measure from La Porta et al. (1999) with the percent of the population that is Catholic, Protestant, Muslim and “other”; these shares add to 100. In our specification, we treat Catholic as the omitted base category. Including religion in this form hardly affects the coefficient on protection against expropriation. The check measure of legal formalism remains positive, small, and insignificant in column 1, and negative, small, and insignificant in columns 4 and 7. The most notable change is in the results for stock market capitalization: in column 10, legal formalism is no longer significant. In all cases, the p-values of the F-test for religion variables indicate that these variables themselves are not significant.<sup>36</sup>

---

<sup>35</sup>A fourth potential control is the level of human capital. Unfortunately, this is highly correlated with our measures of property rights institutions—only countries with relatively good institutions have encouraged the majority of the population to accumulate human capital. It is therefore difficult to disentangle the separate effects of human capital, property rights, and the legal system without additional instruments. When we include this measure as an exogenous regressor and use the protection against expropriation measure, we find similar results to those in our baseline estimates. However, when we use the constraint on the executive measure, there is too much multi-collinearity.

<sup>36</sup>Stulz and Williamson (2003) argue that religion should be coded differently, with a “1” for the most popular religion of a country and a zero for all other religions, no matter how large. Using this alternative

It might also be useful to control for latitude, because countries that are closer to the equator are often argued to be poorer, perhaps because of the hotter climate or because they are exposed to more virulent diseases. The results in Table 9 confirm findings we have reported in other work (Acemoglu, Johnson, and Robinson, 2001, 2002)—once we control for institutions there is no significant effect for geography on income per capita. These tables also show there is no significant effect of geography on investment and on measures of financial development. The pattern of results for property rights institutions and legal formalism is essentially unchanged, except the check measure of legal formalism is no longer a significant determinant of stock market capitalization (see column 11).

Log inflation is included as the most plausible macroeconomic determinant of financial development. Countries with high inflation are often thought to have less developed financial systems. However, the addition of this variable does not reduce the effects of property rights institutions, or increase the effects of legal formalism, on growth, investment, and financial development.

## 6.4 Controlling for GDP Per Capita

We have shown robust effects of property rights institutions on GDP per capita, as well as on investment, credit, and stock market development. These results are not informative, however, on the question of whether the effect of institutions on investment, credit and stock market development is direct or indirect. One possibility is that the effect is direct, that is, present-day institutions affect these outcomes directly. The polar alternative is a purely indirect effect whereby current and past institutions have determined GDP per capita, and GDP per capita today is the main influence on investment and financial development. In practice, both direct and indirect effects are likely to be present.

Table 10 briefly investigates this issue. We include log GDP per capita in 1995 on the right hand side of regressions for the investment to GDP ratio and financial development. Since we do not have plausible instruments for GDP, we have no choice but to treat log GDP per capita as exogenous. As explained in Acemoglu, Johnson, and Robinson (2001), this procedure generally leads to an upward bias in the estimated coefficient for the variable treated as exogenous, and a corresponding downward bias for the effect of property rights institutions. Here the problem is much worse, since log GDP per capita does not significantly affect our main results.



capita and property rights institutions are very strongly correlated precisely because these institutions have a causal effect on economic development—in fact, our results (e.g., Table 4) show that they are a major determinant of GDP per capita.

Not surprisingly given these concerns, the results in Table 10 show a high degree of collinearity, and log GDP per capita, property rights institutions, and legal formalism are not individually significant. However, joint significance tests reported in the table show that GDP per capita and property rights institutions are almost always jointly highly significant, while GDP per capita and legal formalism are never jointly significant. These results therefore confirm the overall patterns shown above—property rights institutions but not contracting institutions have significant effects on investment and financial development. Unfortunately, however, they do not enable us to ascertain whether the effect of property rights institutions on investment and financial development is direct or indirect through affecting GDP per capita. This remains an interesting area for future research.

## 6.5 Corroborating Evidence

In terms of long-run economic and financial outcomes, our results suggest that the effects of legal formalism are quite limited. Tables 11 and 12 further explore why this may be the case. Both tables use data from the Djankov et al. (2002) “Regulation of Entry” study (with an extended sample provided by Djankov, 2003). We show OLS and IV results, in pairs, for the protection against expropriation measure of property rights and both measures of legal formalism; the full first stage results are provided for IV specifications.

Table 11 reports regressions in which the log of the number of procedures for registering a new business is the dependent variable. This is a good measure of the formal steps needed to legally start a new firm which, as shown by Djankov et al. (2002), is highly correlated with other measures of formal requirements imposed on firms. The pattern of results in this table indicates that both legal formalism and property rights institutions have significant effects on the number of procedures.

However, in Table 12 the results are quite different. Here the dependent variable is the actual cost of registering a new business, as a percent of GDP per capita (per annum). Property rights institutions again have a large effect on these costs: a one standard deviation increase in protection against expropriation reduces the cost of registering by 0.65 of a standard deviation, which is quantitatively similar to its effect on the number

of procedures. But in this table there is no robust significant effect for legal formalism in the IV specifications. The coefficient on legal formalism is consistently small; e.g., the coefficient of 0.03 in column 2 implies that a one standard deviation increase in legal formalism causes only a 0.03 of a standard deviation increase in the cost of registration.

These findings seem to corroborate our main results. Contracting institutions have a significant effect on the formal procedures that regulate business. But they appear to have more limited effects on the major economic outcomes—long-run growth, investment, the overall size of the financial system, and the real costs of regulation that businesses face.

## 6.6 Interpretation

Our empirical investigation reveals an interesting pattern: contracting institutions and legal rules, as approximated by legal formalism, have some effect on the form of finance (the use of equity versus debt contracts) and the form of business regulation (in particular, the number of procedures necessary to open a business). But they have limited or no effects on major economic outcomes, including long-run growth (current income levels), the investment to GDP ratio, and the overall amount of financial intermediation in the economy (also on medium-run growth). Property rights institutions, which determine the degree to which the government, politicians, and elites are constrained in their relationships with the rest of the society, on the other hand, matter significantly for all these outcomes.

Although a precise explanation for this pattern of results is not possible with our current level of knowledge, our simple reduced-form model suggests a potential explanation: legal rules and procedures primarily affect the contracting relationship between private individuals, in particular between lenders and producers. As long as these legal institutions are not extremely dysfunctional, individuals can avoid most of the adverse effects of bad legal rules by changing the terms of their contracts or entering into informal arrangements. One way of contracting around these rules is to change the form of financial intermediation, so in places with a high degree of legal formalism (i.e., worse contracting institutions), we may see more debt rather than equity, perhaps because debt contracts are cheaper to enforce. Once these adjustments have been made, the effect of contracting institutions on investments and growth is relatively limited.

When it comes to arrangements regulating property rights and the relationship between the state and individuals, i.e., property rights institutions, the option to engage in ex ante contracts to avoid ex post distortions is not available. Individuals cannot write contracts with the state to constrain future actions by the state and elites controlling the state. Therefore, property rights institutions have a more important effect on economic outcomes than do contracting institutions.

An alternative, and related, explanation would be based on the recent paper by Djankov, Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2003), where they introduce the concept of an “institutions possibilities frontier,” representing the trade-off between disorder and centralized control. In terms of their framework, we can think of legal rules as moving an economy along a given frontier (e.g., greater formalism may correspond to less disorder). Changes in property rights institutions, on the other hand, would induce shifts of the frontier, so that with worse property rights institutions, a society has to suffer higher costs of both disorder and centralized control. As a result, differences in property rights institutions may have much more pronounced effects on investment and output than do differences in contracting institutions.

At present, these interpretations are merely conjectures, however, and more detailed work is necessary to investigate them in greater detail and also to determine the precise channels through which property rights institutions matter so much for finance, investment, and long-run economic performance.

## 7 Conclusion

There is now considerable evidence that “institutions” are of first-order importance for economic and financial outcomes. Douglass North, for example, emphasized in equal measure the importance of “contracting institutions”, enabling private contracts between citizens, and “property rights institutions”, protecting the property rights of citizens against rulers. Despite the importance of these questions for the study of long-run economic performance, there has been relatively little work investigating which types of institutions matter more and for which economic outcomes. This paper offers a step in that direction.

We proxied contracting institutions with the legal formalism measure of Djankov et al., and property rights institutions with measures of protection for citizens against government expropriation and constraints on government power. We used a multiple instrumen-

tal variables strategy in the sample of former European colonies, where both contracting institutions (i.e., legal rules and procedures for private contracts) and property rights institutions are shaped by the experience of colonialism. In this sample, there are strong first-stage relationships between legal origin and legal formalism on the one hand, and between colonization strategy and property rights institutions on the other. Using this multiple instrumental variables strategy, we found robust evidence that property rights institutions have a major influence on long-run economic growth, investment, and financial development, while contracting institutions appear to affect the form of financial intermediation and the form of regulation, but have more limited effects on growth, investment, and the total amount of credit in the economy.<sup>37</sup>

Our conjecture is that individuals can structure contracts to reduce the adverse effects from contracting institutions, for example, by changing the form of intermediation to reduce the cost of providing outside finance to firms. Because of these adjustments, the usual effect of rules governing contracts on investment and growth may be relatively limited; exceptions occur only when contracting institutions are extremely bad. In contrast, because enforceable contracts between the state and individuals are not possible, property rights institutions constraining arbitrary behavior and expropriation by the state and elites controlling the state have more important effects on economic outcomes.

We view this paper as a first step, and much more empirical and theoretical work is needed. Our explanation for the patterns in the data is no more than a conjecture, and detailed work using both macro and micro data is necessary to investigate whether individuals are indeed avoiding the costs of distortionary legal rules by changing the terms of their contracts and the form of their financial relations. Moreover, the effects of property rights institutions on economic outcomes, though highly robust, are still something of a black box—how exactly do property rights institutions affect investment, credit, and growth? Is it because the government and politically powerful groups are expropriating the incomes of other groups? Or is it because they are blocking entry by new groups and producers? Or because they are creating a non-level playing field and a high degree of inequality?

---

<sup>37</sup>Our results also suggest that there may be a misspecification in growth regressions that use legal origin as an instrument for financial development (see Levine, 2003, for a discussion of this common approach). Legal origin is correlated with total financial intermediation or credit, but this effect disappears once we control for property rights institutions. Consequently, the instrumented financial development variable in these growth regressions could be capturing the effect of property rights institutions on growth.

## 8 References

**Acemoglu, Daron (2003a)** “Why Not a Political Coase Theorem? Social Conflict, Commitment and Politics,” *Journal of Comparative Economics*, forthcoming.

**Acemoglu, Daron (2003b)** “State Power and Economic Development” MIT mimeo.

**Acemoglu, Daron, Simon Johnson, and James A. Robinson (2001)** “The Colonial Origins of Comparative Development: An Empirical Investigation,” *American Economic Review*, December, 91, 5, 1369-1401.

**Acemoglu, Daron, Simon Johnson, and James A. Robinson (2002)** “Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution,” *Quarterly Journal of Economics*, 117, November, 1231-1294.

**Acemoglu, Daron, Simon Johnson, James A. Robinson, and Yunyong Thaicharoen (2003)** “Institutional Causes, Macroeconomic Symptoms: Volatility, Crises, and Growth,” *Journal of Monetary Economics*, 50(1), January, 49-123.

**Barro, Robert (1997)** *Determinants of Economic Growth*, MIT University Press, Cambridge.

**Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine (2001)** “The Financial Structure Database,” chapter 2 in *Financial Structure and Economic Growth*, edited by Asli Demirgüç-Kunt and Ross Levine, MIT Press, Cambridge, MA, 17-80.

**Beck, Thorsten and Ross Levine (2002)** “Industry Growth and Capital Allocation: Does Having a Market-Based or Bank-Based System Matter?” *Journal of Financial Economics*, 64, 147-180.

**Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine (2003a)** “Law, Endowments, and Finance,” *Journal of Financial Economics*, forthcoming.

**Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine (2003b)** “Law and Finance: Why Does Legal Origin Matter?” *Journal of Comparative Economics*, forthcoming.

**Berkowitz, Daniel, Katharina Pistor, Jean-Francois Richard (2003)** “Economic Development, Legality, and the Transplant Effect,” *European Economic Review*, 47(1), 165-195.

**Coase, Ronald (1937)** “The Nature of the Firm,” *Economica*, 4(16), 386-405.

**Coase (1960)** “The Problem of Social Cost,” *Journal of Law and Economics*, III, 1-44.

**Crosby, Alfred (1972)** *The Columbian Exchange: Biological and Cultural Consequences of 1492*, Greenwood Press, Westport, Connecticut.

**Curtin, Philip D. (1989)** *Death by Migration: Europe's Encounter with the Tropical World in the 19th Century*, Cambridge University Press, New York.

**Curtin, Philip D. (1998)** *Disease and Empire: The Health of European Troops in the Conquest of Africa*, Cambridge University Press, New York.

**Dawson, John (1960)** *A History of Lay Judges*, Harvard University Press, Cambridge, MA.

**De Long, J. Bradford and Andrei Shleifer (1993)** "Princes and Merchants: European City Growth before the Industrial Revolution," *Journal of Law and Economics*, 36, October, 671-702.

**Demirgüç-Kunt, Asli and Vojislav Maskimovic (2002)** "Funding Growth in Bank-Based and Market-Based Financial Systems: Evidence from Firm-Level Data," *Journal of Financial Economics*, 65(3), 337-363.

**Djankov, Simeon (2003)** Personal Communication.

**Djankov, Simeon, Edward Glaeser, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2003)** "The New Comparative Economics," *Journal of Comparative Economics*, forthcoming.

**Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2002)** "The Regulation of Entry," *Quarterly Journal of Economics*, 117(1), 1-37.

**Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2003)** "Courts," *Quarterly Journal of Economics*, 118, 2, May, 453-517.

**Easterly, William and Ross Levine (2003)** "Tropics, Germs, and Crops: How Endowments Influence Economic Development," *Journal of Monetary Economics*, 50(1), January, 3-39.

**Ellickson, Robert C. (1991)** *Order Without Law: How Neighbors Settle Disputes*, Harvard University Press, Cambridge, MA.

**Glaeser, Edward and Andrei Shleifer (2002)**. "Legal Origins," *Quarterly Journal of Economics*, November, 117, 1193-1230.

**Grossman, Sanford and Oliver Hart (1986)** "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Ownership," *Journal of Political Economy*, 94, 691-719.

**Greif, Avner (1989)** “Reputation and Coalitions in Medieval Trade: Evidence from the Maghribi Traders,” *Journal of Economic History*, XLIX, 4, December, 857-882.

**Gurr, Ted Robert (1997)** “Polity II: Political Structures and Regime Change, 1800-1986,” Unpublished paper, University of Colorado, Boulder.

**Gutierrez, Hector (1986)** “La Mortalité des Eveques Latino-Americains aux XVIIe et XVIII Siecles,” *Annales de Demographie Historique*, 29-39.

**Hart, Oliver and John Moore (1990)** “Property Rights and the Nature of the Firm,” *Journal of Political Economy*, 98, 1119-58.

**Hart, Oliver (1995)** *Firms, Contracts, and Financial Structure*, Oxford University Press, Oxford.

**Heston, Alan, Robert Summers, and Bettina Aten (2002)**, “Penn World Table Version 6.1,” Center for International Comparisons at the University of Pennsylvania (CICUP), October, downloaded in March 2003 from <http://webhost.bridgew.edu/baten/>

**Johnson, Simon, John McMillan, and Christopher Woodruff (2002)** “Property Rights and Finance,” *American Economic Review*, December, 92, 1335-1356.

**Jones, Eric L. (1981)** *The European Miracle: Environments, Economies, and Geopolitics in the History of Europe and Asia*, Cambridge University Press, New York.

**Knack, Stephen and Philip Keefer (1995)** “Institutions and Economic Performance: Cross-Country Tests using Alternative Measures,” *Economics and Politics*, 7, 207-227.

**La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny (1997)** “Legal Determinants of External Finance,” *Journal of Finance* 52, 1131-1150.

**La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny (1998)** “Law and Finance,” *Journal of Political Economy*, 106, 1113-1155.

**La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny (1999)** “The Quality of Government,” *Journal of Law, Economics and Organization*, V15, N1, 222-279.

**Levine, Ross (1997)** “Financial Development and Economic Growth: Views and Agenda,” *Journal of Economic Literature*, June, 35, 688-726.

**Levine, Ross (2003)** “Finance and Growth: Theory, Evidence, and Mechanisms,” *Handbook of Economic Growth*, forthcoming, March draft.

**Levine, Ross and Robert G. King (1993)** “Finance and Growth: Schumpeter

Might Be Right,” *Quarterly Journal of Economics*, 153, August, 717-738.

**Levine, Ross, Norman Loayza, and Thorsten Beck (2000)** “Financial Intermediation and Growth: Causality and Causes,” *Journal of Monetary Economics*, 46, 31-77.

**McEvedy, Colin and Richard Jones (1978)** *Atlas of World Population History*, Facts on File, New York.

**Mahoney, Paul G. (2001)** “The Common Law and Economic Growth: Hayek Might be Right,” *Journal of Legal Studies*, 30, 503-525.

**Merryman, John (1985)** *The Civil Law Tradition*, Stanford University Press, Stanford, CA.

**North, Douglass C. (1981)** *Structure and Change in Economic History*, W.W. Norton & Co., New York.

**Olson, Mancur (2000)** *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships*, Oxford University Press, Oxford.

**Persson, Torsten and Guido Tabellini (1999)** “The Size and Scope of Government: Comparative Politics with Rational Politicians, 1998 Alfred Marshall Lecture,” *European Economic Review*, 43, 699-735.

**Rajan, Raghuram and Luigi Zingales (1998)** “Financial Dependence and Growth,” *American Economic Review* 88, 3, 559-586.

**Rajan, Raghuram and Luigi Zingales (2003)** “The Great Reversals: The Politics of Financial Development in the 20th Century,” *Journal of Financial Economics*, 69(1), 5-50.

**Shapiro, Martin (1981)** *Courts*, The University of Chicago Press, Chicago.

**Stulz, René and Rohan Williamson (2003)** “Culture, Openness, and Finance,” *Journal of Financial Economics*, forthcoming.

**Williamson, Oliver (1975)** *Markets and Hierarchies: Analysis and Antitrust Implications*, New York, NY, Free Press.

**Williamson, Oliver (1985)** *The Economic Institutions of Capitalism*, New York, NY, Free Press.

**World Bank (2003)** *World Development Indicators*, at [publications.worldbank.org/WDI/](http://publications.worldbank.org/WDI/).



**Table 1**  
**Descriptive Statistics**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Whole World Sample	Excolonies Sample	English excolonies	English excolonies with low settler mortality	English excolonies with medium settler mortality	English excolonies with high settler mortality	French excolonies	French excolonies with low settler mortality	French excolonies with medium settler mortality	French excolonies with high settler mortality
	Mean Values (with standard deviations in parentheses)									
Average Protection Against Risk of Expropriation	7.07 (1.81)	6.39 (1.47)	6.93 (1.70)	7.93 (1.63)	6.21 (1.42)	6.21 (1.43)	6.02 (1.16)	6.31 (1.05)	6.34 (1.07)	5.63 (1.20)
Constraint on the Executive	4.48 (2.09)	4.15 (2.09)	4.48 (2.06)	5.65 (1.55)	4.54 (2.60)	3.57 (1.88)	3.99 (1.78)	4.32 (2.05)	4.87 (1.72)	3.31 (1.50)
Legal Formalism (Check Measure)	3.66 (1.06)	3.78 (1.24)	2.77 (0.88)	2.38 (0.96)	2.57 (0.59)	3.15 (0.79)	4.65 (0.75)	4.27 (0.74)	4.79 (0.89)	4.60 (0.54)
Legal Formalism (Eviction Measure)	3.73 (0.92)	3.75 (1.09)	2.99 (0.68)	2.98 (0.82)	2.61 (0.49)	3.15 (0.58)	4.60 (0.79)	4.44 (0.86)	4.65 (0.77)	4.58 (0.91)
Log GDP per capita in 1995 (PPP Measure)	8.36 (1.11)	7.91 (1.00)	8.17 (1.14)	9.04 (1.03)	8.21 (1.12)	7.65 (0.91)	7.71 (0.83)	8.20 (0.95)	8.23 (0.57)	7.22 (0.65)
Average Investment-GDP ratio	14.73 (7.89)	12.30 (7.21)	14.86 (8.37)	19.42 (9.71)	10.13 (4.97)	13.67 (7.34)	10.53 (5.49)	10.98 (6.63)	13.31 (4.36)	8.59 (5.22)
Credit to the Private Sector	0.42 (0.40)	0.36 (0.35)	0.48 (0.44)	0.83 (0.55)	0.36 (0.22)	0.29 (0.25)	0.26 (0.21)	0.45 (0.19)	0.27 (0.17)	0.19 (0.22)
Stock Market Capitalization	0.22 (0.37)	0.17 (0.37)	0.30 (0.51)	0.72 (0.68)	0.13 (0.15)	0.04 (0.06)	0.07 (0.14)	0.18 (0.28)	0.07 (0.08)	0.03 (0.09)
Log Number of Procedures for Registering a New Business	2.25 (0.51)	2.27 (0.57)	1.88 (0.56)	1.64 (0.59)	2.09 (0.43)	2.19 (0.36)	2.61 (0.29)	2.38 (0.19)	2.68 (0.29)	2.62 (0.32)
Cost of Registering a New Business as Percent of GDP per capita	0.48 (0.81)	0.70 (1.05)	0.49 (0.88)	0.15 (0.18)	0.35 (0.23)	1.05 (1.33)	0.89 (1.17)	0.34 (0.42)	1.02 (1.42)	1.00 (1.04)
Log Settler Mortality	n.a.	4.68 (1.20)	4.25 (1.49)	3.01 (0.64)	4.56 (0.26)	6.14 (0.94)	4.93 (0.92)	3.78 (0.46)	4.44 (0.25)	5.75 (0.64)
Log Population Density in 1500	n.a.	0.52 (1.53)	0.25 (1.77)	-0.54 (2.53)	1.35 (1.15)	0.37 (1.13)	0.75 (1.29)	0.83 (2.61)	0.36 (1.20)	0.99 (0.95)

Mean values, with standard deviations in parentheses. "High", "medium", and "low" settler mortality are defined as roughly one third each of the distribution for all excolonies. We have log settler mortality data for 80 former colonies: 29 English legal origin, of which 14 with low mortality, 7 with medium mortality, and 8 with high mortality; 51 French legal origin, of which 8 with low mortality, 20 with medium mortality and 23 with high mortality. Log settler mortality and log population density in 1500 defined only for excolonies. For detailed sources and definitions see Appendix Table A1.

Average protection against risk of expropriation ranges from 1 to 10, where a higher score indicates more protection. The number of observations is 120 (whole world); 75 excolonies; 31 English legal origin excolonies of which 13 with low settler mortality, 6 with medium settler mortality, and 12 with high settler mortality; 44 French legal origin excolonies, of which 6 with low settler mortality, 18 with medium settler mortality, and 20 with high settler mortality.

Constraint on the Executive ranges from 1 to 7, where a higher score indicates more constraint. The number of observations is 159 (whole world); 92 excolonies; 35 English legal origin excolonies of which 13 with low settler mortality, 5 with medium settler mortality and 17 with high settler mortality; 56 French legal origin excolonies, of which 7 with low settler mortality, 20 with medium settler mortality, and 29 with high settler mortality.

Legal Formalism (Check Measure) ranges from 0 to 7, where a higher score indicates a higher level of control or intervention in the judicial process. The number of observations is 113 (whole world); 65 excolonies; 30 English legal origin excolonies of which 11 with low settler mortality, 5 with medium settler mortality, and 14 with high settler mortality; 35 legal origin French excolonies, of which 5 with low settler mortality, 17 with medium settler mortality, and 13 with high settler mortality.

Legal Formalism (Eviction Measure) ranges from 0 to 7, where a higher score indicates a higher level of control or intervention in the judicial process. The number of observations is 103 (whole world); 55 excolonies; 29 English legal origin excolonies of which 11 with low settler mortality, 5 with medium settler mortality, and 13 with high settler mortality; 26 French legal origin excolonies, of which 4 with low settler mortality, 16 with medium settler mortality, and 6 with high settler mortality.

Log GDP per capita in 1995 is PPP adjusted. The number of observations is 168 (whole world); 97 excolonies; 42 English legal origin excolonies of which 13 with low settler mortality, 7 with medium settler mortality and 22 with high settler mortality; 55 French legal origin excolonies, of which 8 with low settler mortality, 19 with medium settler mortality and 28 with high settler mortality.

Investment-GDP ratio is in current prices. The number of observations is 167 (whole world); 98 excolonies; 42 English legal origin excolonies of which 13 with low settler mortality, 7 with medium settler mortality and 22 with high settler mortality; 55 French legal origin excolonies, of which 7 with low settler mortality, 19 with medium settler mortality and 29 with high settler mortality.

Credit to the private sector is percent of GDP. The number of observations is 165 (whole world); 97 excolonies; 43 English legal origin excolonies of which 14 with low settler mortality, 7 with medium settler mortality, and 22 with high settler mortality; 54 French legal origin excolonies, of which 8 with low settler mortality, 19 with medium settler mortality, and 27 with high settler mortality.

Stock Market Capitalization is the market value of all traded stocks as a percent of GDP. The number of observations is 115 (whole world); 84 excolonies; 37 English legal origin excolonies of which 13 with low settler mortality, 7 with medium settler mortality and 17 with high settler mortality; 47 French legal origin excolonies, of which 7 with low settler mortality, 17 with medium settler mortality and 23 with high settler mortality.

Log procedures is the log of number of procedures needed to open a new business. We have data on 82 countries in our sample, of which 43 are former colonies: 20 English legal origin excolonies, of which 11 are low mortality, 2 are medium mortality and 7 are high mortality; 23 French legal origin excolonies, of which 4 are low mortality, 11 are medium mortality and 8 are high mortality.

Cost of registering a new business as a percent of GDP per capita per annum. We have data on 81 countries in our sample, of which 42 are former colonies: 20 English origin excolonies, of which 11 are low mortality, 2 are medium mortality and 7 are high mortality; 22 French origin excolonies, of which 4 are low mortality, 11 are medium mortality and 7 are high mortality.

Log Population density in 1500 is available for 98 former colonies, of which: 42 are English origin, of which 13 are low mortality, 7 are medium mortality, and 22 are high mortality; and 56 are French legal origin, of which 6 are low mortality, 20 are medium mortality, and 30 are high mortality.

Table 2

## Contracting Institutions: GDP per capita, Credit, and Stock Market Capitalization

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole World	Excolonies Sample	Excolonies Sample	Whole World	Excolonies Sample	Excolonies Sample
	OLS		2SLS, with Check Measure	OLS		2SLS, with Eviction Measure
<i>Panel A: Dependent variable is log GDP per capita in 1995</i>						
Legal Formalism (Check Measure)	-0.28 (0.10)	-0.21 (0.10)	-0.18 (0.14)			
Legal Formalism (Eviction Measure)				-0.10 (0.12)	-0.06 (0.12)	-0.04 (0.17)
R-Squared in OLS	0.07	0.07		0.008	0.005	
First Stage for Measure of Legal Formalism (Check or Eviction Measure)						
English Legal Origin			-1.87 (0.20)			-1.61 (0.20)
R-Squared in First Stage			0.58			0.56
Number of Observations	109	65	65	99	55	55
<i>Panel B: Dependent variable is average ratio of investment to GDP in 1990s</i>						
Legal Formalism (Check Measure)	-1.85 (0.67)	-1.19 (0.71)	-1.77 (0.94)			
Legal Formalism (Eviction Measure)				-0.69 (0.82)	-0.43 (0.91)	-1.15 (1.22)
R-Squared in OLS	0.07	0.04		0.007	0.004	
Number of Observations	110	65	65	100	55	55
<i>Panel C: Dependent variable is credit to the private sector as a percent of GDP in 1998</i>						
Legal Formalism (Check Measure)	-0.16 (0.04)	-0.14 (0.03)	-0.13 (0.05)			
Legal Formalism (Eviction Measure)				-0.08 (0.05)	-0.08 (0.05)	-0.12 (0.07)
R-Squared in OLS	0.16	0.21		0.03	0.05	
Number of Observations	104	65	65	94	55	55
<i>Panel D: Dependent variable is stock market capitalization as a percent of GDP, average over 1990-95</i>						
Legal Formalism (Check Measure)	-0.17 (0.03)	-0.17 (0.04)	-0.16 (0.05)			
Legal Formalism (Eviction Measure)				-0.11 (0.05)	-0.09 (0.06)	-0.17 (0.07)
R-Squared in OLS	0.24	0.26		0.06	0.05	
Number of Observations	90	62	62	80	52	52

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country. The dependent variable is: in Panel A, log GDP per capita (in PPP terms) in 1995, from the World Bank's WDI on-line; in Panel B, the investment to GDP ratio, in current prices, average over 1990s, from Penn World Tables 6.1; in Panel C, level of credit to the private sector as a percent of GDP in 1998, from the World Bank's WDI on-line; and in Panel D, the level of stock market capitalization as a percent of GDP, 1990-95, from Beck et al (2003a). The independent variable is: in columns 1, 2 and 3, legal formalism, using the "check measure", from Djankov (2003); in columns 4, 5, and 6, legal formalism, using the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In all four panels the measure of legal formalism is instrumented using a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003).

**Table 3**  
**Property Rights Institutions: GDP per capita, Credit, and Stock Market Capitalization**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Whole World	Excolonies Sample	Excolonies Sample	Excolonies Sample	Whole World	Excolonies Sample	Excolonies Sample	Excolonies Sample
	OLS		2SLS, with Protect. Against Exprop.	2SLS, with Protect. Against Exprop.	OLS		2SLS, with Constraint on Executive	2SLS, with Constraint on Executive
<i>Panel A: Dependent variable is log GDP per capita in 1995</i>								
Average Protection Against Risk of Exprop.	0.56 (0.04)	0.52 (0.06)	1.05 (0.19)	1.07 (0.22)				
Constraint on Executive					0.34 (0.04)	0.32 (0.05)	0.76 (0.15)	0.70 (0.15)
R-Squared in OLS	0.63	0.54			0.35	0.34		
First Stage for Measure of Institutions (Protection Against Expropriation or Constraint on Executive )								
Log Settler Mortality			-0.57 (0.13)				-0.80 (0.16)	
Log Population Density in 1500				-0.36 (0.10)				-0.56 (0.12)
R-Squared in First Stage			0.23	0.17			0.26	0.24
Number of Observations	110	65	65	65	146	69	69	69
<i>Panel B: Dependent variable is average ratio of investment to GDP in 1990s</i>								
Average Protection Against Risk of Exprop.	3.17 (0.33)	3.00 (0.48)	5.50 (1.12)	5.48 (1.33)				
Constraint on Executive					1.61 (0.30)	1.40 (0.42)	4.16 (1.04)	3.76 (1.08)
R-Squared in OLS	0.45	0.38			0.16	0.14		
Number of Observations	113	65	65	65	149	70	70	70
<i>Panel C: Dependent variable is credit to the private sector as a percent of GDP in 1998</i>								
Average Protection Against Risk of Exprop.	0.15 (0.02)	0.16 (0.03)	0.37 (0.08)	0.31 (0.08)				
Constraint on Executive					0.08 (0.02)	0.08 (0.02)	0.25 (0.06)	0.17 (0.05)
R-Squared in OLS	0.32	0.33			0.15	0.19		
Number of Observations	109	66	66	66	140	70	70	70
<i>Panel D: Dependent variable is stock market capitalization as a percent of GDP, average over 1990-95</i>								
Average Protection Against Risk of Exprop.	0.11 (0.02)	0.14 (0.03)	0.30 (0.08)	0.26 (0.09)				
Constraint on Executive					0.06 (0.02)	0.06 (0.02)	0.21 (0.06)	0.14 (0.05)
R-Squared in OLS	0.24	0.25			0.12	0.07		
Number of Observations	95	63	63	63	105	66	66	66

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country. The dependent variable is: in Panel A, log GDP per capita (in PPP terms) in 1995; in Panel B, the investment to GDP ratio, in current prices, average over 1990s, from Penn World Tables 6.1; in Panel C, the level of credit to the private sector as a percent of GDP in 1998, from the World Bank's WDI on-line; and in Panel D, the level of stock market capitalization as a percent of GDP, 1990-95, from Beck et al (2003a). The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson and Robinson (2001); in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of institutions is instrumented: in columns 3 and 7, using log settler mortality before 1850 (where mortality is per 1000 per annum with replacement) from Acemoglu, Johnson and Robinson (2001); and in columns 4 and 8, using log population density in 1500 from Acemoglu, Johnson and Robinson (2002).

Table 4  
Contracting vs. Property Rights Institutions: GDP per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is log GDP per capita in 1995</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	0.63 (0.08)	0.95 (0.16)	0.64 (0.08)	1.53 (0.25)				
Constraint on Executive					0.31 (0.07)	0.99 (0.29)	0.33 (0.07)	0.75 (0.18)
Legal Formalism (Check Measure)	0.11 (0.09)	0.35 (0.15)			-0.16 (0.10)	0.05 (0.24)		
Legal Formalism (Eviction Measure)			0.28 (0.09)	0.45 (0.16)			-0.04 (0.11)	0.08 (0.20)
R-Squared in OLS	0.62		0.61		0.33		0.34	
First Stage for Measure of Institutions (Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.60 (0.31)		0.44 (0.33)		-0.002 (0.48)		-0.22 (0.46)
Log Settler Mortality		-0.71 (0.12)		-0.70 (0.15)		-0.65 (0.19)		-0.92 (0.21)
R-Squared in First Stage		0.50		0.42		0.21		0.33
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.96 (0.24)		-1.69 (0.24)		-1.88 (0.23)		-1.7 (0.24)
Log Settler Mortality		0.15 (0.10)		-0.02 (0.11)		0.11 (0.09)		0.01 (0.11)
R-Squared in First Stage		0.63		0.57		0.62		0.56
Number of Observations	51	51	43	43	51	51	42	42

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is log GDP per capita (PPP adjusted) in 1995, from the World Bank's WDI on-line. The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson and Robinson (2001); in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); and log settler mortality before 1850 (where mortality is per 1000 per annum with replacement).

Table 5  
Contracting vs. Property Rights Institutions: Investment-GDP ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is average ratio of investment to GDP in 1990s</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	3.88 (0.65)	4.68 (1.11)	4.23 (0.72)	5.28 (1.18)				
Constraint on Executive					1.08 (0.57)	4.70 (1.87)	1.04 (0.66)	3.91 (1.40)
Legal Formalism (Check Measure)	0.67 (0.71)	0.57 (1.08)			-1.05 (0.83)	-0.80 (1.55)		
Legal Formalism (Eviction Measure)			1.57 (0.85)	0.91 (1.20)			-0.46 (1.01)	-0.85 (1.64)
R-squared in OLS	0.47		0.47		0.10		0.06	
First Stage for Measure of Institutions (Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.60 (0.31)		0.44 (0.33)		-0.002 (0.48)		-0.22 (0.46)
Log Settler Mortality		-0.71 (0.12)		-0.70 (0.15)		-0.65 (0.19)		-0.92 (0.21)
R-Squared in First Stage		0.50		0.42		0.21		0.33
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.96 (0.24)		-1.69 (0.24)		-1.88 (0.23)		-1.70 (0.24)
Log Settler Mortality		0.15 (0.10)		-0.02 (0.11)		0.11 (0.09)		0.01 (0.11)
R-Squared in First Stage		0.63		0.57		0.62		0.56
Number of Observations	51	51	43	43	51	51	42	42

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is the investment to GDP ratio, in current prices, average over 1990s, from Penn World Tables 6.1. The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson and Robinson (2001); in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003); and log settler mortality before 1850 (where mortality is per 1000 per annum with replacement).

Table 6  
Contracting vs. Property Rights Institutions: Private Credit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is credit to the private sector in 1998 as a percent of GDP</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	0.13 (0.04)	0.28 (0.07)	0.19 (0.05)	0.36 (0.09)				
Constraint on Executive					0.06 (0.03)	0.27 (0.10)	0.06 (0.03)	0.19 (0.06)
Legal Formalism (Check Measure)	-0.09 (0.04)	0.01 (0.07)			-0.13 (0.04)	-0.08 (0.08)		
Legal Formalism (Eviction Measure)			0.01 (0.05)	0.001 (0.09)			-0.08 (0.05)	-0.13 (0.08)
R-squared in OLS	0.42		0.34		0.28		0.13	
First Stage for Measure of Institutions (Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.60 (0.31)		0.44 (0.33)		-0.002 (0.48)		-0.22 (0.46)
Log Settler Mortality		-0.71 (0.12)		-0.70 (0.15)		-0.66 (0.19)		-0.92 (0.21)
R-Squared in First Stage		0.50		0.42		0.21		0.33
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.96 (0.24)		-1.69 (0.24)		-1.88 (0.23)		-1.70 (0.24)
Log Settler Mortality		0.15 (0.10)		-0.02 (0.11)		0.11 (0.09)		0.01 (0.11)
R-Squared in First Stage		0.63		0.57		0.62		0.56
Number of Observations	51	51	43	43	51	51	42	42

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is credit to the private sector as a percent of GDP in 1998, from the World Bank. The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson and Robinson (2001); in columns 4 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); and log settler mortality before 1850 (where mortality is per 1000 per annum with replacement).

Table 7  
**Contracting vs. Property Rights Institutions: Stock Market Capitalization**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is stock market capitalization, average 1990-95, as a percent of GDP</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	0.10 (0.04)	0.21 (0.07)	0.17 (0.06)	0.32 (0.10)				
Constraint on Executive					0.04 (0.03)	0.20 (0.09)	0.05 (0.04)	0.17 (0.06)
Legal Formalism (Check Measure)	-0.15 (0.05)	-0.10 (0.07)			-0.17 (0.04)	-0.16 (0.07)		
Legal Formalism (Eviction Measure)			-0.03 (0.07)	-0.10 (0.10)			-0.10 (0.06)	-0.20 (0.08)
R-squared in OLS	0.43		0.23		0.31		0.11	
First Stage for Measure of Institutions (Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.61 (0.31)		0.45 (0.33)		-0.05 (0.49)		-0.28 (0.46)
Log Settler Mortality		-0.71 (0.12)		-0.70 (0.15)		-0.65 (0.19)		-0.91 (0.21)
R-Squared in First Stage		0.50		0.42		0.20		0.33
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-2.00 (0.24)		-1.76 (0.23)		-1.93 (0.23)		-1.77 (0.23)
Log Settler Mortality		0.15 (0.09)		-0.004 (0.10)		0.11 (0.09)		0.004 (0.11)
R-Squared in First Stage		0.66		0.62		0.65		0.62
Number of Observations	50	50	42	42	50	50	41	41

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is the level of stock market capitalization as a percent of GDP in 1990-95, from Beck et al (2003). The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson, and Robinson (2001); and in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); and log settler mortality before 1850 (where mortality is per 1000 per annum with replacement).

Table 8  
Contracting vs. Property Rights Institutions: Alternative Samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)				
	Just French Just Common legal origin Law countries				Without neo- Europes				Just countries above median world income			
	Just French Just Common legal origin Law countries				Without neo- Europes				Just countries above median world income			
<i>Panel A:</i>	<i>Dependent variable is log GDP per capita in 1995</i>				<i>Dependent variable is investment-GDP ratio in 1990s</i>							
	Second Stage Regression											
Average Protection Against Risk of Expropriation	1.12 (0.27)	1.45 (0.67)	1.10 (0.23)	1.15 (0.29)	6.30 (1.78)	5.37 (2.46)	5.72 (1.57)	6.65 (2.18)				
Legal Formalism (Check Measure)			0.31 (0.16)	0.40 (0.22)			0.26 (1.12)	1.52 (1.63)				
	First Stage for Average Protection Against Risk of Expropriation											
English Legal Origin			0.33 (0.30)	0.61 (0.39)			0.33 (0.30)	0.61 (0.39)				
Log Settler Mortality	-0.59 (0.19)	-0.32 (0.19)	-0.55 (0.13)	-0.65 (0.19)	-0.59 (0.19)	-0.45 (0.20)	-0.55 (0.13)	-0.65 (0.19)				
R-Squared in First Stage	0.30	0.07	0.32	0.41	0.30	0.12	0.32	0.41				
	First Stage for Check Measure of Legal Formalism											
English Legal Origin			-1.89 (0.26)	-2.16 (0.32)			-1.89 (0.26)	-2.16 (0.32)				
Log Settler Mortality			0.09 (0.11)	0.12 (0.16)			0.09 (0.11)	0.12 (0.16)				
R-Squared in First Stage			0.56	0.65			0.56	0.65				
Number of Observations	25	40	47	42	25	40	47	42				
	Just French Just Common legal origin Law countries				Without neo- Europes				Without Outliers			
<i>Panel B:</i>	<i>Dependent variable is credit to the private sector as a percent of GDP</i>				<i>Dependent variable is stock market capitalization as a percent of GDP</i>							
Average Protection Against Risk of Expropriation	0.44 (0.13)	0.24 (0.17)	0.35 (0.11)	0.24 (0.06)	0.39 (0.15)	0.09 (0.05)	0.36 (0.11)	0.14 (0.05)				
Legal Formalism (Check Measure)			-0.03 (0.08)	-0.02 (0.06)			-0.14 (0.07)	-0.06 (0.05)				
Number of Observations	26	40	47	48	25	38	46	47				

Standard errors are in parentheses. All regressions are two stage least squares; cross-sectional data with one observation per country; we use only the excolonies sample. The dependent variables are: in columns 1-4, Panel A, log GDP per capita, PPP adjusted, from the World Bank's WDI on-line; in columns 5-8, Panel A, investment-GDP ratio, average over 1990s, from Penn World Tables 6.1; in columns 1-4, Panel B, credit to the private sector as share of GDP in 1998, from the World Bank's WDI on-line; in columns 5-8, Panel B, stock market capitalization as share of GDP, from Beck et al. (2003a). The measure of institutions used as an independent variable is average protection against risk of expropriation, as used in Acemoglu, Johnson, and Robinson (2001). The measure of legal formalism used as an independent variable is the "check measure", from Djankov (2003). The instruments are: in columns 3-4 and 7-8 a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); in all columns, log settler mortality before 1850 (where mortality is per 1000 per annum with replacement).

Columns 3 and 7 drop the four "neo-Europes": Australia, Canada, New Zealand, and USA. In columns 4 and 8, Panel A, we drop all countries below median world income (using GDP per capita, PPP, in 1995). In columns 4 and 8, Panel B, we drop outliers. The Excolonies Sample includes all former colonies of European Powers for which we have data. For more detailed data definitions and sources see Appendix Table 1.



Table 9  
Contracting vs. Property Rights Institutions: Other Control Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable is log GDP per capita in 1995			Dependent Variable is investment-GDP ratio			Dependent Variable is private credit as a percent of GDP			Dependent variable is stock market capitalization as percent of GDP		
	Religion	Latitude	Log Inflation	Religion	Latitude	Log Inflation	Religion	Latitude	Log Inflation	Religion	Latitude	Log Inflation
	Second Stage											
Average Protection	0.88	0.96	0.98	3.65	5.60	4.68	0.28	0.30	0.28	0.21	0.28	0.22
Against Risk of Expropriation	(0.16)	(0.18)	(0.16)	(1.36)	(1.32)	(1.13)	(0.09)	(0.09)	(0.07)	(0.09)	(0.09)	(0.07)
Legal Formalism	0.09	0.34	0.32	-2.56	0.93	0.55	-0.05	0.001	0.01	-0.14	-0.08	-0.10
(Check Measure)	(0.28)	(0.15)	(0.16)	(2.31)	(1.14)	(1.14)	(0.15)	(0.08)	(0.07)	(0.15)	(0.08)	(0.08)
p-value for religion	[0.50]			[0.24]			[0.82]			[0.48]		
Latitude		0.37			-12.70			-0.31			-0.86	
		(1.00)			(7.42)			(0.49)			(0.51)	
Log Inflation			0.08			0.11			-0.03			-0.02
			(0.09)			(0.65)			(0.70)			(0.04)
	First Stage for Average Protection Against Expropriation											
English Legal Origin	0.09	0.61	0.58	0.09	0.61	0.58	0.09	0.61	0.58	0.08	0.62	0.58
	(0.42)	(0.31)	(0.33)	(0.42)	(0.31)	(0.33)	(0.42)	(0.31)	(0.33)	(0.44)	(0.31)	(0.33)
Log Settler Mortality	-0.70	-0.65	-0.71	-0.70	-0.65	-0.71	-0.70	-0.65	-0.71	-0.70	-0.65	-0.71
	(0.12)	(0.13)	(0.13)	(0.12)	(0.13)	(0.13)	(0.12)	(0.13)	(0.13)	(0.13)	(0.14)	(0.13)
R-Squared in First Stage	0.55	0.52	0.50	0.55	0.52	0.50	0.55	0.52	0.50	0.55	0.52	0.50
	First Stage for Check Measure of Legal Formalism											
English Legal Origin	-1.10	-1.97	-1.94	-1.10	-1.97	-1.94	-1.10	-1.97	-1.94	-1.13	-2.01	-1.94
	(0.28)	(0.24)	(0.25)	(0.28)	(0.24)	(0.25)	(0.28)	(0.24)	(0.25)	(0.29)	(0.24)	(0.25)
Log Settler Mortality	0.19	0.12	0.15	0.19	0.12	0.15	0.19	0.12	0.15	0.19	0.12	0.15
	(0.08)	(0.11)	(0.09)	(0.08)	(0.11)	(0.09)	(0.08)	(0.11)	(0.09)	(0.08)	(0.10)	(0.09)
R-Squared in First Stage	0.76	0.64	0.66	0.76	0.64	0.66	0.76	0.64	0.66	0.76	0.66	0.66
Number of Observations	51	51	50	51	51	50	51	51	50	50	50	50

Standard errors are in parentheses. All regressions are two stage least squares; cross-sectional data with one observation per country; we use only the excolonies sample. The dependent variables are: in columns 1-3, log GDP per capita in 1995; in columns 4-6, investment-GDP ratio, average over 1990s; in columns 7-9, private credit as share of GDP; in columns 10-12, stock market capitalization as share of GDP. The independent variables are: in columns 1, 4 and 7, dummy variables for majority religions, Protestant, Muslim, and Other, with Catholic as the omitted category, from La Porta et al (1999); in columns 2, 5 and 8, the absolute normalized value of distance from the equator (i.e., a standardized measure of latitude), in which a higher value indicates that a country's capital is further from the equator; in columns 3, 6 and 9, the log of average annual inflation in the Consumer Price Index from 1970 to 1997, from the World Bank. The other control variables are included in the first stage but not reported to save space.

The measure of legal formalism used as an independent variable is the "check measure", from Djankov (2003). The measure of institutions used as an independent variable is constraint on the executive, averaged over the 1990s, from Polity IV. The instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); and log settler mortality before 1850 (where mortality is per 1000 per annum with replacement). The Excolonies Sample includes all former colonies of European Powers for which we have data. For more detailed data definitions and sources see Appendix Table 1.

Table 10  
Investment-GDP ratio, Credit, and Market Capitalization: Controlling for GDP per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	<i>Dependent variable is average ratio investment to GDP in 1990s</i>				<i>Dependent variable is credit to private sector</i>				<i>Dependent variable is market capitalization</i>			
	2SLS, with Protect Against Exprop. & Check Measure	2SLS, with Protect Against Exprop. & Check Measure	2SLS, with Protect Against Exprop. & Eviction Measure	2SLS, with Protect Against Exprop. & Eviction Measure	2SLS, with Protect Against Exprop. & Check Measure	2SLS, with Protect Against Exprop. & Check Measure	2SLS, with Protect Against Exprop. & Eviction Measure	2SLS, with Protect Against Exprop. & Eviction Measure	2SLS, with Protect Against Exprop. & Check Measure	2SLS, with Protect Against Exprop. & Check Measure	2SLS, with Protect Against Exprop. & Eviction Measure	2SLS, with Protect Against Exprop. & Eviction Measure
	Second Stage Regression											
Average Protection Against Risk of Expropriation	-0.59 (6.72)	5.11 (9.27)	2.71 (20.17)	3.14 (4.04)	0.51 (0.64)	-0.04 (0.42)	1.83 (5.38)	-0.12 (0.24)	0.42 (0.62)	0.04 (0.51)	1.96 (5.95)	-0.04 (0.31)
Legal Formalism (Check Measure)	-1.28 (2.66)	0.99 (4.02)			0.07 (0.25)	-0.11 (0.18)			-0.03 (0.25)	-0.14 (0.22)		
Legal Formalism (Eviction Measure)			-0.18 (8.58)	0.02 (2.03)			0.62 (2.29)	-0.18 (0.12)			0.60 (2.53)	-0.22 (0.15)
Log GDP per capita in 1995	5.35 (6.14)	0.64 (7.51)	2.57 (19.49)	2.42 (3.38)	-0.24 (0.58)	0.27 (0.34)	-1.47 (5.20)	0.37 (0.20)	-0.21 (0.57)	0.15 (0.41)	-1.65 (5.76)	0.26 (0.26)
p-value for joint test Protection against Expropriation and GDP per capita	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	[0.43]	[0.00]	[0.05]	[0.00]	[0.59]	[0.00]
p-value for joint test Check Measure of Formalism and GDP per capita	[0.46]	[0.42]	[0.65]	[0.36]	[0.90]	[0.62]	[0.96]	[0.20]	[0.42]	[0.49]	[0.89]	[0.32]
	First Stage for Protection Against Expropriation											
English Legal Origin	0.67 (0.25)	0.80 (0.24)	0.70 (0.28)	0.71 (0.25)	0.67 (0.25)	0.80 (0.24)	0.70 (0.28)	0.71 (0.25)	0.70 (0.25)	0.82 (0.24)	0.75 (0.28)	0.73 (0.26)
Log Settler Mortality	-0.17 (0.15)		-0.03 (0.20)		-0.17 (0.15)		-0.03 (0.20)		-0.16 (0.15)		-0.01 (0.20)	
Log Population Density in 1500		-0.07 (0.08)		-0.12 (0.09)		-0.07 (0.08)		-0.12 (0.09)		-0.08 (0.08)		-0.12 (0.09)
Log GDP per capita in 1995	0.84 (0.17)	0.80 (0.13)	0.95 (0.22)	0.70 (0.16)	0.84 (0.17)	0.80 (0.13)	0.95 (0.22)	0.70 (0.16)	0.86 (0.17)	0.81 (0.13)	0.99 (0.23)	0.71 (0.16)
R-Squared in First Stage	0.68	0.62	0.61	0.53	0.68	0.62	0.61	0.53	0.68	0.62	0.58	0.56
	First Stage for Legal Formalism (Check or Eviction Measure)											
English Legal Origin	-1.97 (0.24)	-1.94 (0.22)	-1.72 (0.25)	-1.66 (0.22)	-1.97 (0.24)	-1.94 (0.22)	-1.72 (0.25)	-1.66 (0.22)	-2.02 (0.24)	-1.98 (0.21)	-1.81 (0.23)	-1.73 (0.20)
Log Settler Mortality	0.05 (0.14)		-0.08 (0.18)		0.05 (0.14)		-0.08 (0.18)		0.03 (0.14)		-0.13 (0.17)	
Log Population Density in 1500		0.03 (0.08)		-0.04 (0.08)		0.03 (0.08)		-0.04 (0.08)		0.04 (0.08)		-0.03 (0.07)
Log GDP per capita in 1995	-0.14 (0.16)	-0.12 (0.12)	-0.09 (0.20)	-0.09 (0.14)	-0.14 (0.16)	-0.12 (0.12)	-0.09 (0.20)	-0.09 (0.14)	-0.18 (0.16)	-0.13 (0.12)	-0.18 (0.19)	-0.11 (0.13)
R-Squared in First Stage	0.62	0.63	0.57	0.57	0.62	0.63	0.57	0.57	0.67	0.65	0.60	0.60
Number of Observations	51	57	43	49	51	57	43	49	50	56	42	48

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is: in columns 1 through 4, the investment to GDP ratio, in current prices, average over 1990s, from Penn World Tables 6.1; in columns 5 through 8, credit to the private sector as a percent of GDP in 1998, from the World Bank; and in columns 9 through 12, stock market capitalization as a percent of GDP in 1990-95, from Beck et al (2003). The measure of institutions used as an independent variable is average protection against the risk of expropriation as used in Acemoglu, Johnson and Robinson (2001). The measure of legal formalism used as an independent variable is: in columns 1-2, 5-6, and 9-10 the "check measure", from Djankov (2003); in columns 3-4, 7-8, and 11-12 the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). The instruments are: in all columns, log GDP per capita in 1995 and a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); in odd numbered columns, log settler mortality before 1850 (where mortality is per 1000 per annum with replacement); and in even numbered columns, log population density in 1500.

Table 11  
Contracting vs. Property Rights Institutions: Procedures for Entry

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is log number of procedures for registering a new business</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	-0.17 (0.05)	-0.20 (0.08)	-0.21 (0.05)	-0.31 (0.09)	-0.17 (0.04)	-0.24 (0.10)	-0.21 (0.05)	-0.27 (0.08)
Legal Formalism (Check Measure)	0.15 (0.05)	0.18 (0.08)			0.16 (0.05)	0.16 (0.08)		
Legal Formalism (Eviction Measure)			0.17 (0.06)	0.21 (0.09)			0.17 (0.06)	0.22 (0.08)
R-squared in OLS	0.50		0.51		0.50		0.52	
First Stage for Protection Against Expropriation								
English Legal Origin		0.53 (0.32)		0.35 (0.34)		0.83 (0.32)		0.51 (0.31)
Log Settler Mortality		-0.72 (0.12)		-0.71 (0.15)				
Log Population Density						-0.36 (0.09)		-0.38 (0.08)
R-Squared in First Stage		0.51		0.43		0.35		0.37
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.86 (0.25)		-1.64 (0.25)		-1.87 (0.22)		-1.60 (0.22)
Log Settler Mortality		0.16 (0.10)		-0.01 (0.11)				
Log Population Density						0.08 (0.06)		0.003 (0.06)
R-Squared in First Stage		0.62		0.54		0.61		0.55
Number of Observations	48	48	40	40	54	54	46	46

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is the log of the number of procedures needed to register a business, from Djankov (2003). The measure of institutions is average protection against the risk of expropriation as used in Acemoglu, Johnson and Robinson (2001). The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: in all columns, a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); in columns 2 and 4, log settler mortality before 1850 (where mortality is per 1000 per annum with replacement); and in columns 6 and 8, log population density in 1500.

Table 12  
Contracting vs. Property Rights Institutions: Cost of Entry

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is cost of registering a new business as percent of GDP per capita</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure
	OLS or Second Stage Regression							
Average Protection Against Risk of Expropriation	-0.43 (0.11)	-0.44 (0.18)	-0.23 (0.05)	-0.38 (0.09)	-0.40 (0.10)	-0.28 (0.22)	-0.22 (0.05)	-0.25 (0.09)
Legal Formalism (Check Measure)	-0.07 (0.12)	0.03 (0.18)			0.06 (0.11)	0.11 (0.19)		
Legal Formalism (Eviction Measure)			-0.13 (0.07)	-0.17 (0.10)			-0.12 (0.06)	0.10 (0.09)
R-squared in OLS	0.30		0.33		0.28		0.29	
	First Stage for Protection Against Expropriation							
English Legal Origin		0.53 (0.32)		0.37 (0.32)		0.83 (0.32)		0.51 (0.31)
Log Settler Mortality		-0.72 (0.12)		-0.71 (0.15)				
Log Population Density						-0.36 (0.09)		-0.38 (0.08)
R-Squared in First Stage		0.51		0.43		0.35		0.37
	First Stage for Measure of Legal Formalism (Check or Eviction Measure)							
English Legal Origin		-1.86 (0.25)		-1.64 (0.25)		-1.87 (0.22)		-1.6 (0.22)
Log Settler Mortality		0.16 (0.10)		-0.01 (0.11)				
Log Population Density						0.08 (0.06)		0.003 (0.06)
R-Squared in First Stage		0.62		0.54		0.61		0.55
Number of Observations	48	48	40	40	54	54	46	46

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is the cost of registering a business as a percent of GDP per capita, from Djankov (2003). The measure of institutions used as an independent variable is average protection against the risk of expropriation as used in Acemoglu, Johnson, and Robinson (2001). The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); in columns 2 and 4, log settler mortality before 1850 (where mortality is per 1000 per annum with replacement); and in columns 6 and 8, log population density in 1500.

## Appendix Tables: Not for Publication

**Appendix Table A1**  
**Variable Definitions and Sources**

Variable	Description	Source
Average Protection against Expropriation Risk	Risk of expropriation of private foreign investment by government, from 0 to 10, where a higher score means less risk. We calculated the mean value for the scores in all years from 1985 to 1995. This variable is as previously used in Acemoglu, Johnson, and Robinson (2001).	Dataset obtained directly from Political Risk Services, September 1999. These data were previously used by Knack and Keefer (1995) and were organized in electronic form by the IRIS Center (University of Maryland). The original compilers of these data are Political Risk Services.
Constraint on Executive	A seven category scale, from 1 to 7, with a higher score indicating more constraint. Score of 1 indicates unlimited authority; score of 3 indicates slight to moderate limitations; score of 5 indicates substantial limitations; score of 7 indicates executive parity or subordination. Scores of 2, 4, and 6 indicate intermediate values. We calculated average values from 1990 to 2000, inclusive, treating interregnums as missing values.	Polity IV dataset, downloaded from Inter-University Consortium for Political and Social Research. Variable described in Gurr (1997).
Legal Formalism (Check Measure)	Index of formality in legal procedures for collecting on a bounced check, from 1 to 7.	Djankov (2003), an extension of the data in Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003).
Legal Formalism (Eviction Measure)	Index of formality in legal procedures for evicting a tenant for nonpayment of rent, from 1 to 7.	Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003)
Log GDP per capita in 1995 (PPP Measure)	Logarithm of GDP per capita, on Purchasing Power Parity Basis, in 1995.	World Bank, World Development Indicators, on-line version, February 2003.
Average Investment-GDP ratio in 1990s	Ratio of investment to GDP, in current prices, average from 1990 to 1999. If data are missing for a country in any year, this year is ignored in calculating the average.	Penn World Tables version 6.1., Heston, Summers, and Aten (2002), data from the web at <a href="http://webhost.bridgew.edu/baten/">http://webhost.bridgew.edu/baten/</a>
Credit to the Private Sector (or private credit)	As a percent of GDP in 1998: financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises.	World Bank (2003), World Development Indicators, on-line version, February 2003.
Stock Market Capitalization	Market value of all traded stocks as a percent of GDP, average over 1990-95	Beck, Demirgüç-Kunt, and Levine(2003a); data from the web at <a href="http://www.worldbank.org/research/bios/tbeck/LPF.xls">http://www.worldbank.org/research/bios/tbeck/LPF.xls</a> .
Procedures for Registering a New Business	Number of separate procedures needed to register a new business	Djankov (2003), an extension of the data in Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002).
Cost of Registering a New Business	Cost of registering a new business, as a percent of GDP per capita	Djankov (2003), an extension of the data in Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002).
Alternative Measure of Credit to the Private Sector	Credit by deposit money banks and other financial institutions to the private sector as share of GDP, average over 1980-95.	Beck, Demirgüç-Kunt, and Levine (2003a); data from the web at <a href="http://www.worldbank.org/research/bios/tbeck/LPF.xls">http://www.worldbank.org/research/bios/tbeck/LPF.xls</a>
M2	M2 monetary aggregate, as percent of GDP, average over 1980-95.	Beck, Demirgüç-Kunt, and Levine (2001); data from the web at <a href="http://www.worldbank.org/research/projects/finstructure/database.htm">http://www.worldbank.org/research/projects/finstructure/database.htm</a>
Liquid Liabilities	Ratio of currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries to GDP, average over 1980-95.	Beck, Demirgüç-Kunt, and Levine (2003a); data from the web at <a href="http://www.worldbank.org/research/bios/tbeck/LPF.xls">http://www.worldbank.org/research/bios/tbeck/LPF.xls</a>
Alternative Measure of Stock Market Capitalization	Ratio of total value of outstanding traded shares to GDP, average over 1980-95.	Beck, Demirgüç-Kunt, and Levine (2003a); data from the web at <a href="http://www.worldbank.org/research/bios/tbeck/LPF.xls">http://www.worldbank.org/research/bios/tbeck/LPF.xls</a>
Overall Size of Financial System	Credit to the private sector, as percent of GDP, in 1998 plus stock market capitalization, average over 1990-95	Credit from World Bank (2003), World Development Indicators, on-line version, February 2003. Stock market capitalization from Beck et al (2003a); data from the web at <a href="http://www.worldbank.org/research/bios/tbeck/LPF.xls">http://www.worldbank.org/research/bios/tbeck/LPF.xls</a>
Overall Size of Financial System, Alternative Measure	Deposit money bank assets plus stock market capitalization as share of GDP, averages over 1980-95.	Beck, Demirgüç-Kunt, and Levine (2001). Data from the web at <a href="http://www.worldbank.org/research/projects/finstructure/database.htm">http://www.worldbank.org/research/projects/finstructure/database.htm</a>
Religion Variables	Percentage of the population that belonged in 1980 (or for 1990-95 for countries formed more recently) to the following religions: Roman Catholic, Protestant, Muslim, and "other".	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999)

<b>Variable</b>	<b>Description</b>	<b>Source</b>
Latitude	Absolute value of the latitude of the country, scaled to take values between 0 and 1, where 0 is the equator.	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999)
Log Inflation	Log of average annual inflation in the Consumer Price Index from 1970 to 1998.	World Bank, World Development Indicators, CD-Rom, 1999, as used in Acemoglu, Johnson, Robinson, and Thaicharoen (2003).
English Legal Origin (or Common Law countries)	Coded zero or one. One indicates that country was colonized by Britain and English legal code was transferred.	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999), and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003).
French Legal Origin (or Civil Law countries)	Coded zero or one. One indicates that country was colonized by France, Spain, Belgium, Portugal or Germany and French legal code was transferred.	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999), and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003).
Log Settler Mortality	Log of estimated mortality for European settlers during the early period of European colonization (before 1850). Settler mortality is calculated from the mortality rates of European-born soldiers, sailors and bishops when stationed in colonies. It measures the effects of local diseases on people without inherited or acquired immunities.	Acemoglu, Johnson, and Robinson (2001), based on Curtin (1989) and other sources.
Log Population Density	Log of population density in 1500; population density is inhabitants per square kilometer.	Acemoglu, Johnson, and Robinson (2002), based on McEvedy and Jones (1978).

Table A2  
Contracting vs. Property Rights Institutions: Economic Growth, 1970-95

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is annual average growth rate of GDP per capita, 1970-95</i>								
	OLS	2SLS, with Protection Against Risk of Expropriation & Check Measure	OLS	2SLS, with Protection Against Risk of Expropriation & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
Panel A: OLS or Second Stage Regression, with log settler mortality as instrument								
Average Protection Against Risk of Expropriation	0.64 (0.20)	1.00 (0.32)	0.59 (0.22)	0.99 (0.38)				
Constraint on Executive					-0.07 (0.15)	1.00 (0.52)	-0.05 (0.15)	0.68 (0.38)
Legal Formalism (Check Measure)	-0.08 (0.21)	0.13 (0.31)			-0.38 (0.20)	-0.10 (0.41)		
Legal Formalism (Eviction Measure)			0.11 (0.25)	0.25 (0.36)			-0.21 (0.22)	-0.05 (0.38)
R-squared in OLS	0.29		0.19		0.07		0.03	
Number of Observations	47	47	40	40	47	47	39	39
Panel B: OLS or Second Stage Regression, with log population density as instrument								
Average Protection Against Risk of Expropriation	0.79 (0.21)	0.25 (0.53)	0.75 (0.23)	0.37 (0.42)				
Constraint on Executive					0.04 (0.15)	0.09 (0.44)	0.06 (0.16)	0.21 (0.42)
Legal Formalism (Check Measure)	0.11 (0.22)	-0.30 (0.42)			-0.23 (0.21)	-0.41 (0.29)		
Legal Formalism (Eviction Measure)			0.29 (0.27)	-0.10 (0.39)			-0.10 (0.25)	-0.22 (0.33)
R-squared in OLS	0.27		0.21		0.02		0.01	
Number of Observations	52	52	45	45	54	54	45	45

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is average annual growth in GDP per capita from 1970 to 1995, from the World Bank (2003) WDI CD-Rom. The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson, and Robinson (2001); in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: in both Panels, a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); in Panel A, log settler mortality before 1850 (where mortality is per 1000 per annum with replacement); and in Panel B, log population density in 1500.

Table A3  
Regressions with Reduced Form for Origin and IV for Property Rights Institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable indicated at the top of each column											
	Log GDP per capita in 1995	Investment-GDP ratio in 1990s	Credit to the private sector as percent of GDP	Market capitalization as percent of GDP	Log number procedures for registering a new business	Cost of registering a new business (percent of GDP per capita)	Log GDP per capita in 1995	Investment-GDP ratio in 1990s	Credit to the private sector as percent of GDP	Market capitalization as percent of GDP	Log number procedures for registering a new business	Cost of registering a new business (percent of GDP per capita)
	Second Stage Regression											
Average Protection	1.20	6.02	0.39	0.3	-0.24	-0.45	1.08	5.55	0.28	0.24	-0.27	-0.31
Against Risk of Expropriation	(0.24)	(1.39)	(0.10)	(0.09)	(0.06)	(0.15)	(0.23)	(1.41)	(0.08)	(0.09)	(0.08)	(0.19)
English Legal Origin	-0.91	-3.16	-0.13	0.01	-0.32	0.05	-0.83	-2.67	-0.06	0.03	-0.27	-0.19
	(0.38)	(2.36)	(0.16)	(0.15)	(0.14)	(0.32)	(0.34)	(2.18)	(0.12)	(0.13)	(0.14)	(0.31)
	First Stage for Protection Against Expropriation											
English Legal Origin	0.76	0.73	0.70	0.81	0.53	0.53	0.90	0.90	0.87	0.98	0.83	0.83
	(0.32)	(0.33)	(0.32)	(0.33)	(0.32)	(0.32)	(0.29)	(0.30)	(0.29)	(0.31)	(0.32)	(0.32)
Log Settler Mortality	-0.49	-0.54	-0.48	-0.54	-0.72	-0.72						
	(0.13)	(0.13)	(0.13)	(0.13)	(0.12)	(0.12)						
Log Population Density							-0.34	-0.36	-0.34	-0.34	-0.36	-0.36
							(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
R-Squared in First Stage	0.27	0.32	0.28	0.30	0.51	0.51	0.28	0.27	0.28	0.28	0.32	0.35
Number of Observations	65	65	66	63	48	48	71	71	72	69	54	54

Standard errors are in parentheses. All regressions are two stage least squares; cross-sectional data with one observation per country; we use only the excolonies sample. The dependent variables are: in columns 1 and 7, log GDP per capita in 1995; in columns 2 and 8, investment-GDP ratio; in columns 3 and 9, credit to the private sector as share of GDP; in columns 4 and 10, stock market capitalization as share of GDP; in columns 5 and 11, the log number of procedures required to register a business; in columns 6 and 12, the cost of registering a business as a percent of GDP per capita. Sources are as in previous tables. All columns have a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003). The instruments are: in columns 1 through 6, log settler mortality before 1850 (where mortality is per 1000 per annum with replacement); and in columns 7 through 12, log population density in 1500.



Table A4

## Contracting vs. Property Rights Institutions: GDP per capita, with alternative instrument

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is log GDP per capita in 1995</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	0.64 (0.08)	1.09 (0.22)	0.64 (0.09)	0.97 (0.18)				
Constraint on Executive					0.29 (0.07)	0.88 (0.27)	0.31 (0.07)	0.88 (0.27)
Legal Formalism (Check Measure)	0.15 (0.09)	0.44 (0.18)			-0.13 (0.10)	-0.002 (0.21)		
Legal Formalism (Eviction Measure)			0.28 (0.11)	0.45 (0.16)			-0.05 (0.11)	-0.004 (0.24)
R-Squared in OLS	0.55		0.52		0.27		0.31	
First Stage for Measure of Institutions (Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.87 (0.30)		0.59 (0.30)		0.05 (0.43)		-0.26 (0.47)
Log Population Density in 1500		-0.36 (0.09)		-0.38 (0.08)		-0.40 (0.13)		-0.40 (0.13)
R-Squared in First Stage		0.35		0.37		0.15		0.16
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.95 (0.22)		-1.64 (0.21)		-1.74 (0.21)		-1.59 (0.21)
Log Population Density in 1500		0.07 (0.06)		-0.01 (0.06)		0.04 (0.06)		-0.02 (0.06)
R-Squared in First Stage		0.62		0.57		0.57		0.54
Number of Observations	57	57	49	49	60	60	50	50

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is log GDP per capita (PPP adjusted) in 1995, from the World Bank's WDI on-line. The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson, and Robinson (2001); in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); and log population density in 1500 from Acemoglu, Johnson, and Robinson (2002).

Table A5

## Contracting vs. Property Rights Institutions: Investment-GDP ratio, with alternative instrument

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is average ratio of investment to GDP in 1990s</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	3.81 (0.63)	5.80 (1.50)	4.07 (0.70)	4.48 (1.26)				
Constraint on Executive					1.00 (0.51)	4.24 (1.77)	0.94 (0.57)	4.82 (2.02)
Legal Formalism (Check Measure)	0.71 (0.68)	1.27 (1.21)			-0.94 (0.76)	-1.34 (1.37)		
Legal Formalism (Eviction Measure)			1.38 (0.81)	1.10 (1.18)			-0.54 (0.93)	-1.42 (1.78)
R-squared in OLS	0.43		0.43		0.09		0.06	
First Stage for Measure of Institutions ( Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.87 (0.30)		0.59 (0.30)		0.05 (0.43)		-0.26 (0.47)
Log Population Density in 1500		-0.36 (0.09)		-0.38 (0.08)		-0.40 (0.13)		-0.40 (0.13)
R-Squared in First Stage		0.35		0.37		0.15		0.16
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.95 (0.22)		-1.64 (0.21)		-1.74 (0.21)		-1.59 (0.21)
Log Population Density in 1500		0.07 (0.06)		-0.01 (0.06)		0.04 (0.06)		-0.02 (0.06)
R-Squared in First Stage		0.62		0.57		0.57		0.54
Number of Observations	57	57	49	49	60	60	50	50

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is the investment to GDP ratio, in current prices, average over 1990s, from Penn World Tables 6.1. The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson, and Robinson (2001); in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); and log population density in 1500.

Table A6

## Contracting vs. Property Rights Institutions: Private Credit, with alternative instrument

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is credit to the private sector in 1998 as a percent of GDP</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	0.13 (0.04)	0.25 (0.09)	0.18 (0.04)	0.24 (0.08)				
Constraint on Executive					0.06 (0.02)	0.17 (0.07)	0.06 (0.03)	0.18 (0.08)
Legal Formalism (Check Measure)	-0.08 (0.04)	0.01 (0.07)			-0.11 (0.04)	-0.08 (0.06)		
Legal Formalism (Eviction Measure)			0.002 (0.05)	-0.02 (0.07)			-0.08 (0.05)	-0.10 (0.07)
R-squared in OLS	0.36		0.30		0.23		0.13	
First Stage for Measure of Institutions (Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.87 (0.30)		0.59 (0.30)		0.05 (0.43)		-0.26 (0.47)
Log Population Density in 1500		-0.36 (0.09)		-0.38 (0.08)		-0.40 (0.13)		-0.40 (0.13)
R-Squared in First Stage		0.35		0.37		0.15		0.16
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.95 (0.22)		-1.64 (0.21)		-1.74 (0.21)		-1.59 (0.21)
Log Population Density in 1500		0.07 (0.06)		-0.01 (0.06)		0.04 (0.06)		-0.02 (0.06)
R-Squared in First Stage		0.62		0.57		0.57		0.54
Number of Observations	57	57	49	49	60	60	50	50

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is credit to the private sector as a percent of GDP in 1998, from the World Bank. The measure of institutions used as an independent variable is: in columns 4 through 8, average protection against the risk of expropriation as used in Acemoglu, Johnson, and Robinson (2001); and in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003 and Djankov (2003)); and log population density in 1500 from Acemoglu, Johnson, and Robinson (2002).

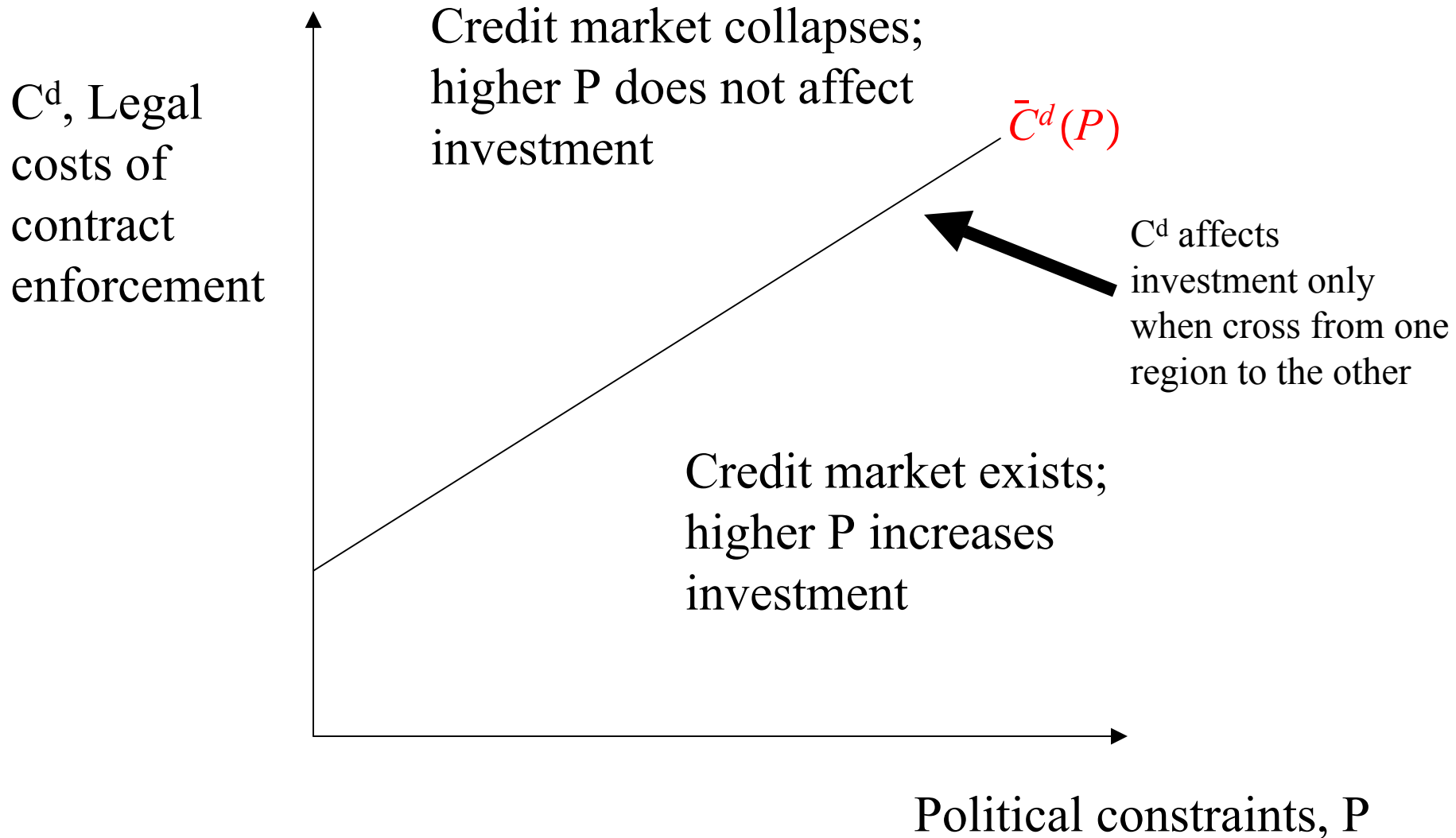
Table A7

## Contracting vs. Property Rights Institutions: Stock Market Capitalization, with alternative instrument

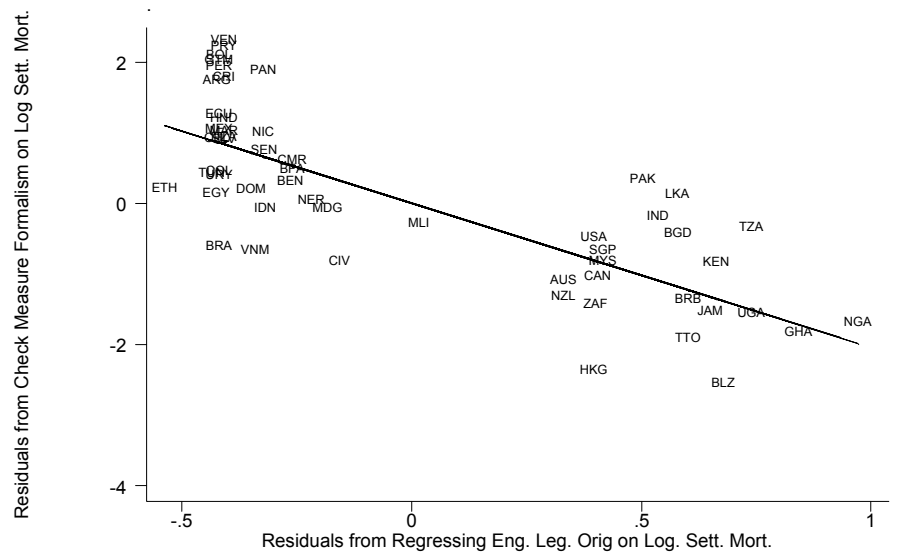
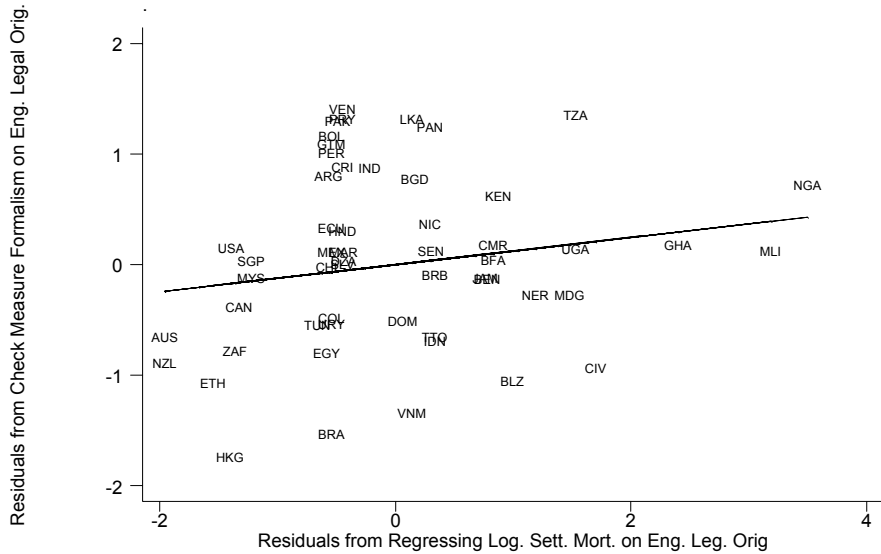
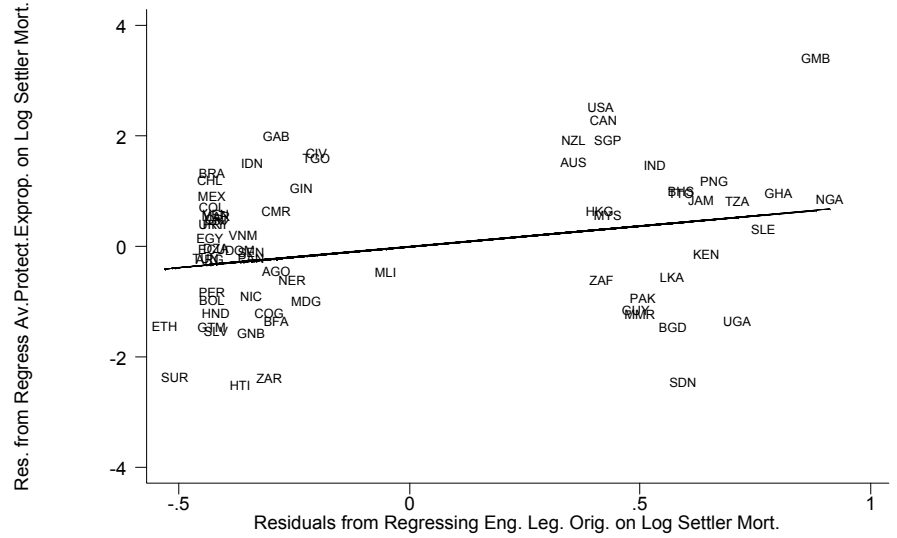
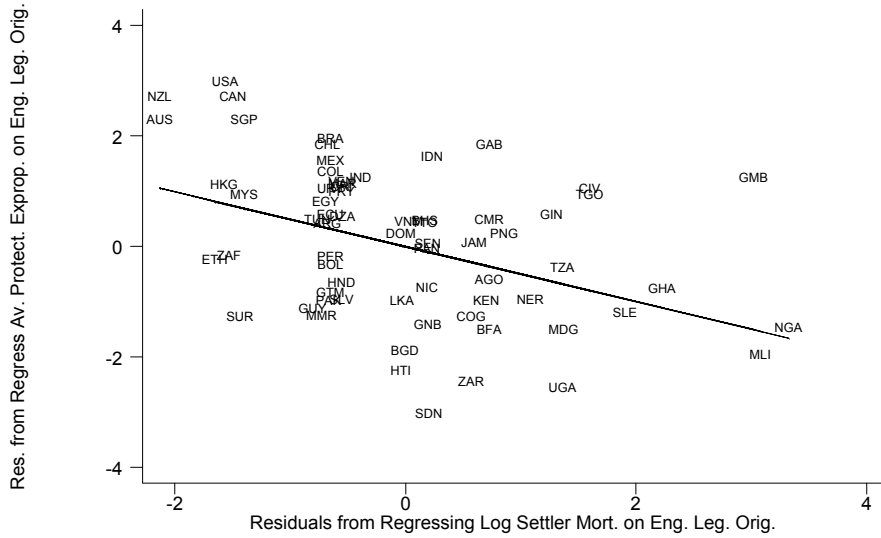
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable is stock market capitalization, average 1990-95, as a percent of GDP</i>								
	OLS	2SLS, with Protect Against Exprop. & Check Measure	OLS	2SLS, with Protect Against Exprop. & Eviction Measure	OLS	2SLS, with Constraint on Exec. & Check Measure	OLS	2SLS, with Constraint on Exec. & Eviction Measure
OLS or Second Stage Regression								
Average Protection Against Risk of Expropriation	0.10 (0.04)	0.21 (0.09)	0.17 (0.05)	0.22 (0.09)				
Constraint on Executive					0.04 (0.03)	0.13 (0.07)	0.05 (0.03)	0.15 (0.09)
Legal Formalism (Check Measure)	-0.13 (0.04)	-0.08 (0.07)			-0.15 (0.04)	-0.14 (0.05)		
Legal Formalism (Eviction Measure)			-0.03 (0.06)	-0.11 (0.08)			-0.09 (0.05)	-0.17 (0.08)
R-squared in OLS	0.38		0.24		0.26		0.10	
First Stage for Measure of Institutions (Protect. Against Expropriation or Constraint on Executive)								
English Legal Origin		0.89 (0.31)		0.60 (0.30)		0.02 (0.44)		-0.31 (0.47)
Log Population Density in 1500		-0.37 (0.09)		-0.38 (0.08)		-0.39 (0.13)		-0.38 (0.13)
R-Squared in First Stage		0.36		0.37		0.14		0.16
First Stage for Measure of Legal Formalism (Check or Eviction Measure)								
English Legal Origin		-1.99 (0.21)		-1.71 (0.20)		-1.78 (0.20)		-1.65 (0.20)
Log Population Density in 1500		0.08 (0.06)		0.008 (0.06)		0.05 (0.06)		-0.006 (0.06)
R-Squared in First Stage		0.64		0.62		0.59		0.59
Number of Observations	56	56	48	48	59	59	49	49

Standard errors are in parentheses. All regressions are cross-sectional with one observation per country; we use only the excolonies sample. The dependent variable is the level of stock market capitalization as a percent of GDP in 1990-95, from Beck et al (2003). The measure of institutions used as an independent variable is: in columns 1 through 4, average protection against the risk of expropriation as used in Acemoglu, Johnson, and Robinson (2001); and in columns 5 through 8, constraint on the executive, averaged over the 1990s, from Polity IV. The measure of legal formalism used as an independent variable is: in columns 1-2 and 5-6, the "check measure", from Djankov (2003); in columns 3-4 and 7-8, the "eviction measure" from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003). In columns 1, 3, 5, and 7 we report OLS results. In columns 2, 4, 6, and 8 the instruments are: a dummy variable for whether a country has an English legal origin, as classified by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov (2003); and log population density in 1500 from Acemoglu, Johnson, and Robinson (2002).

# Figure 1

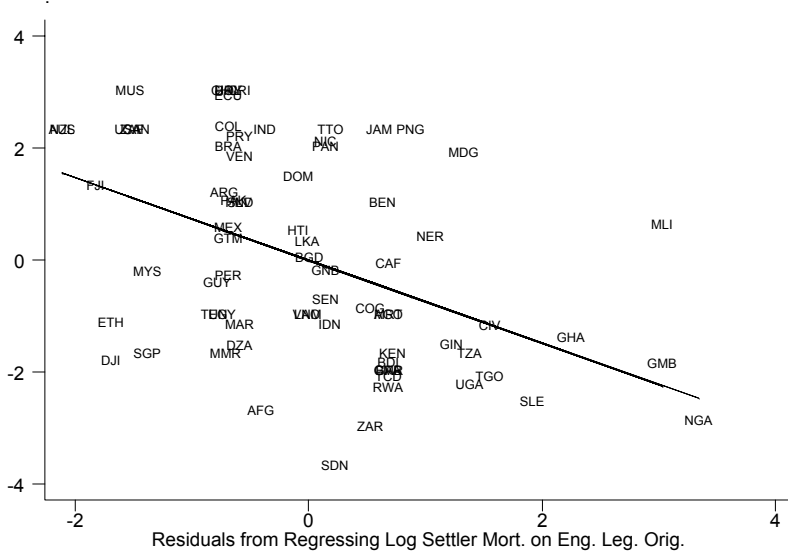


# Figure 2

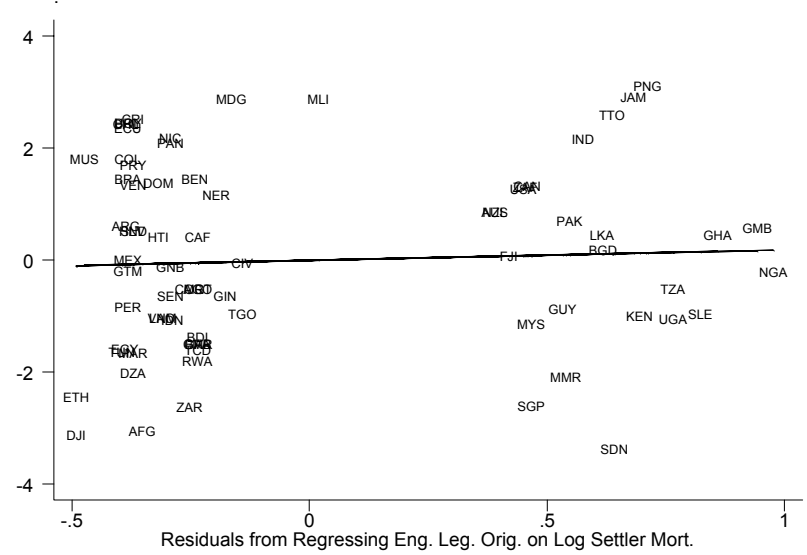


# Figure 3

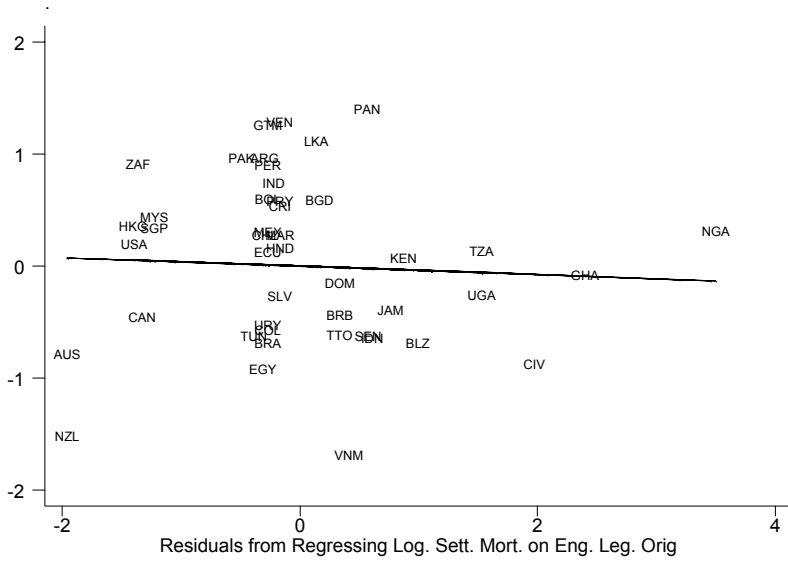
Residuals from Regressing Constraint on Exec on Eng. Leg. Orig.



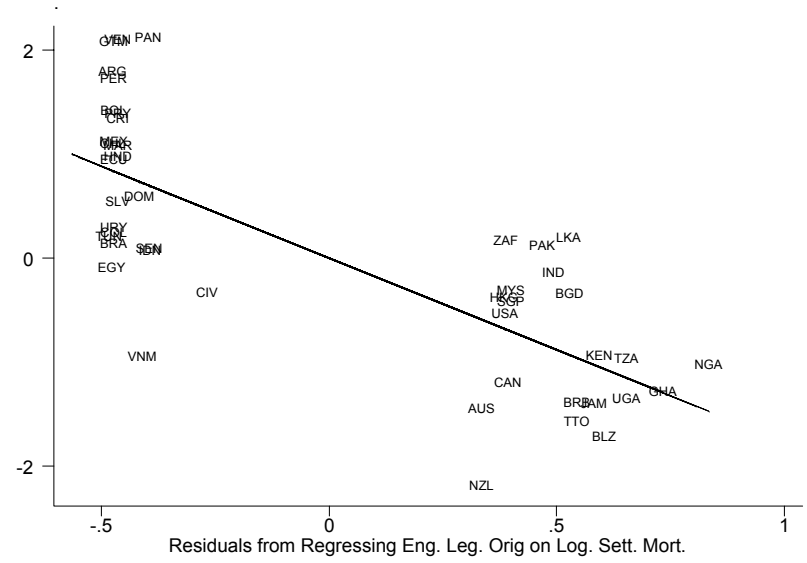
Resid. from Regress Cons. on Exec on Log Settler Mort.



Residuals from Eviction Measure Formalism on Eng. Legal Orig.

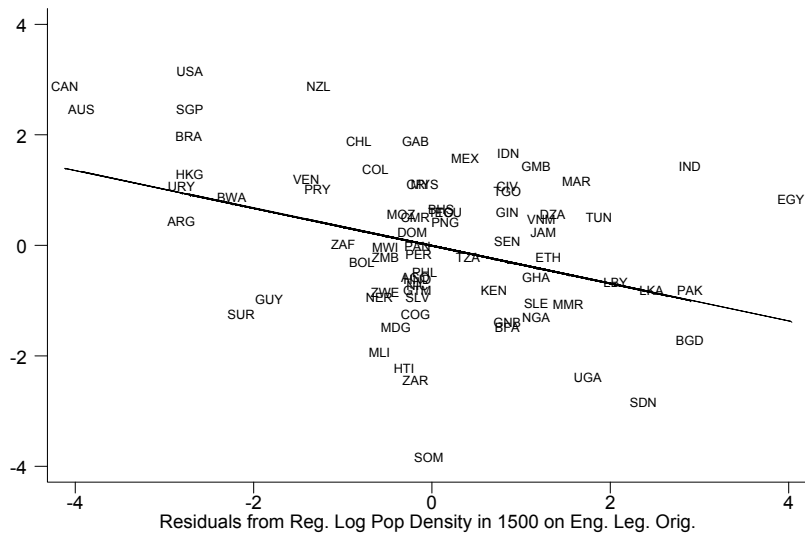


Residuals from Eviction Measure Formalism on Log Sett. Mort.

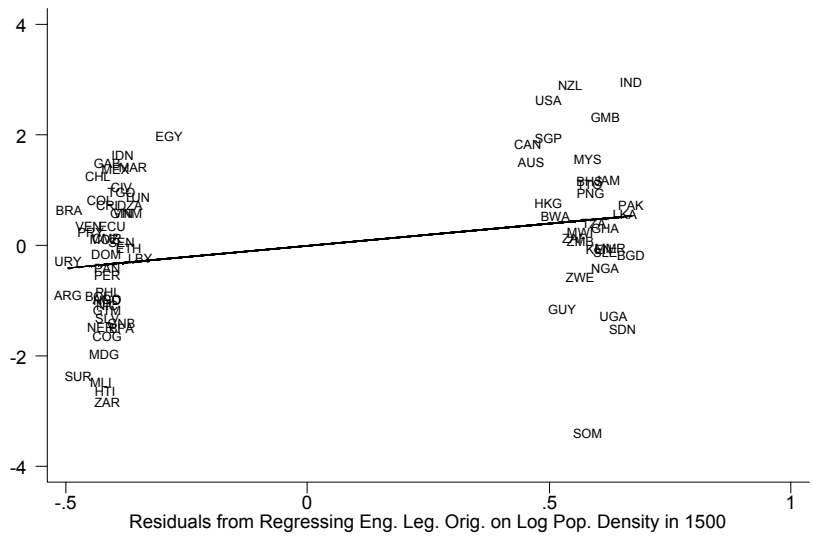


# Figure 4

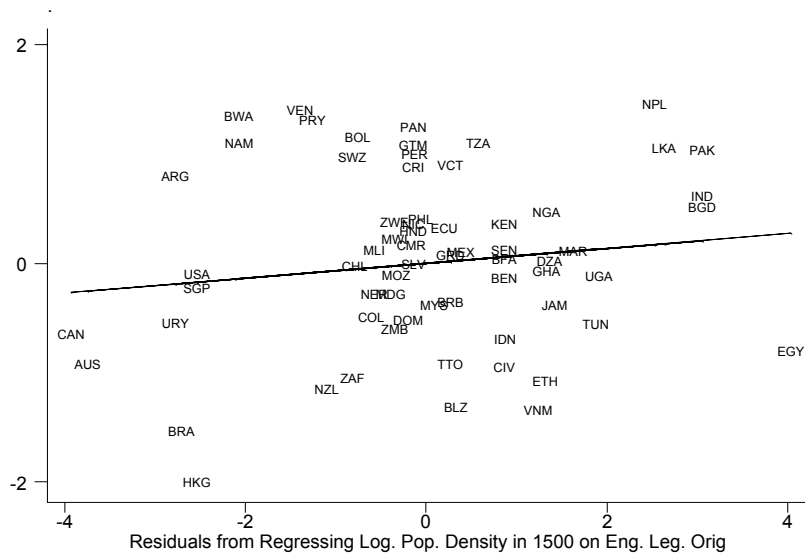
Res. from Regress Av. Protect. Exprop. on Eng. Leg. Orig.



Res. from Regress Av. Protect. Exprop. on Log Pop. Density in 1500



Residuals from Check Measure Formalism on Eng. Legal Orig.



Res. from Check Measure Formalism on Log Pop. Density in 1500

