Unbundling Institutions

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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 weak contracting institutions but find it harder to mitigate the risk of expropriation in this way.

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I. 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, 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, that is, 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"). Instead, it has documented the importance of a "cluster" of institutions that include both contracting and private property protection elements, despite the existence of well-established theoretical arguments emphasizing each set of institutions. For example, the contract theory literature, starting with Coase (1937, esp. 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; Hart 1995). In contrast, other authors emphasize the importance of private property rights, especially their protection against government expropriation (see, e.g., Jones 1981; De Long and Shleifer 1993; Olson 2000).

This paper is an attempt to unbundle the broad cluster of institutions and learn more about the relative importance of contracting versus property rights institutions at the macro level. There are a number of conceptual and empirical challenges that such an investigation has to overcome. First, there is potentially much overlap between contracting and property rights institutions. Nevertheless, there are also important differences. Although both sets of institutions relate to opportunistic behavior, the nature of such behavior is different. Contracting institutions regulate transactions between private parties, such as a debtor and a creditor. Both parties to such a relationship may like to deviate from the prespecified contractual terms, and they can do so only because of "failures" in implementation and enforcement. While weak contracting institutions can be very costly, citizens also have certain recourses. Most important, they can change the terms of the contracts or the nature of their activities to protect themselves from the worst type of opportunistic behavior. In contrast, property rights institutions are intimately linked to the distribution of political power in society because they regulate the relationship between ordinary private citizens and the politicians or elites with access to political power. When property rights institutions fail to constrain those who control the state, it is not possible to circumvent the ensuing problems by writing alternative contracts to prevent future expropriation, because the state, with its monopoly of legitimate violence, is the ultimate arbiter of contracts (see Acemoglu 2003).

The second challenge is to find valid proxies for the two sets of institutions. For contracting institutions, the ideal proxy would measure the costs of enforcing private contracts (i.e., contracts in which both parties are ordinary citizens). Three different measures originating from the work by Djankov et al. (2003) and the World Bank (2004) come close to such an ideal measure. The first is an index of legal formalism, measuring the number of formal legal procedures necessary to resolve a simple case of collecting on an unpaid check. The second is an index of procedural complexity, measuring the difficulties in resolving the case of an unpaid commercial debt. The third is the number of procedures necessary to resolve a court case involving this same commercial debt. All three measures explicitly deal with a dispute between private citizens without access to special political power and correspond to the costs of enforcing a straightforward contract.

For property rights institutions, we use Polity IV's constraint on the executive measure, Political Risk Services' assessment of protection against government expropriation in a country, and the Heritage Foundation's assessment of private property protection. While the latter two measures are close to our concept of institutions that protect private property, they are also outcomes themselves, for example, determined by whether there is actual expropriation in equilibrium. For this reason, our preferred measure is constraint on executive, which has two advantages: first, it corresponds to the procedural rules constraining state action, and second, it highlights the close relationship between property rights institutions and political institutions.[1] A potential disadvantage of

[1] An earlier version of the paper referred to property rights institutions as "political institutions." We removed this terminology because some readers interpreted it as referring to the type of constitution or the ideological leanings of the politicians. An alternative terminology would be to refer to the two sets of institutions as "horizontal" and "vertical" institutions to emphasize that the first regulates transactions between ordinary citizens whereas the second regulates relations between the state (elites) and citizens.

this measure is that it is mainly about constraints on the executive, ignoring constraints on expropriation by other elites including the legislature.

Using these measures, ordinary least squares (OLS) regressions show that 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 sets of institutions, which brings us to the third challenge involved in this empirical investigation: to identify potentially exogenous and distinct sources of variation in property rights institutions and contracting institutions.

Fortunately, the literature offers potential instruments for both sets of institutions. Djankov et al. (2002, 2003), building on work by La Porta et al. (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 a French (civil-law) legal origin have substantially higher degrees of legal formalism than English (common-law) legal origin countries. Moreover, as these authors argue, at least for former European colonies, the legal system can be thought of as "exogenous" because it was imposed by colonial powers.[2] We show that legal origin also has a large, precisely estimated, and robust effect on the other measures of contracting institutions.

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. Countries with health conditions less favorable to European settlement and in which there was a larger local population available for some form of capture have tended to develop weaker property rights institutions. Via this channel, these variables have influenced the historical development of the state-society relations and the degree of property rights enforcement in the former colonies today.

Our approach in this paper is to use a multiple instrumental variables

[2] 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 not only affects legal transactions but also regulates the power of politically powerful groups. Mahoney (2001) also argues that legal origin has an effect on economic growth through a variety of channels. If these views are correct, our instrumental variables estimates of the effect of contracting institutions will be biased upward and can be interpreted as upper bounds. Nevertheless, below we also provide evidence suggesting that legal origin does not have a significant (direct or indirect) effect on economic growth, investment, and overall financial development once we control for the effect of property rights institutions.

strategy, exploiting these sources of variation. The success of the multiple instrumental variables 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. We show that in the sample of former European colonies, the legal system imposed by colonial powers has a strong effect on all three measures of contracting institutions and little effect on our 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 our measures of contracting institutions.

We estimate a large effect 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 gross domestic product, and more developed stock markets. In contrast, our findings indicate that the role of contracting institutions is more limited. Once we control for the effects of property rights institutions, contracting institutions seem to have no impact on income per capita, the investment to GDP ratio, and the private credit to GDP ratio. We do, however, find some evidence that countries with worse contracting institutions have less developed stock markets.

These results suggest that contracting institutions affect the form of financial intermediation but have less impact on economic growth, investment, and the overall level of financial development. It seems that economies can function in the face of weak contracting institutions without disastrous consequences, but not in the presence of a significant risk of expropriation from the government or other powerful groups. Our interpretation is that private contracts or other reputation-based mechanisms can, at least in part, alleviate the problems originating from weak contracting institutions. For example, when it is more difficult for lenders to collect on their loans, interest rates increase, banks that can monitor effectively play a more important role, or reputation-based credit relationships may emerge. In contrast, property rights institutions relate to the relationship between the state and 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.

Our results are predicated on the notion that we have successfully distinguished contracting and property rights institutions in the data. We provide a series of “falsification tests” to show that this is indeed the case. Using firm-level data from the World Bank’s (2000) World Business Environment Survey (WBES, an interactive Web tool: http://www.info.worldbank.org/governance/wbes/), we look at the relationship between contracting and property rights institutions (and our instruments for these variables) and firms' assessment of various problems they face in operating their businesses. Contracting issues—such as firms' assessments of the quality of the courts, the overall functioning of the judiciary, and violation of their copyrights, patents, and trademarks by other firms—are predicted by legal origin and our measures of contracting institutions, and they are *not* related to property rights institutions, settler mortality, or population density in 1500. In contrast, firms' assessments of the extent of government corruption or the predictability of the legislature and the executive are related to property rights institutions, settler mortality, and population density in 1500, but *not* to legal origin or to contracting institutions. We interpret this evidence as supporting our contention that there are distinct dimensions of the broad cluster of institutions related to contracting between private citizens and to citizen-elite relationships and that our empirical strategy is, at least partly, capturing these differences.

In addition to work by La Porta et al. and Djankov et al., the papers closest to our work are those by Beck, Demirgüç-Kunt, and Levine (2003) and Rajan and Zingales (2003), which evaluate the effect of legal origin on financial development. Beck et al. find evidence that both legal origin and potential settler mortality matter for financial development.[3] However, they only estimate reduced-form relationships and do not specify the mechanisms through which legal origin may affect economic and financial outcomes. Rajan and Zingales 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. None of these studies attempt to estimate the separate effects of contracting and property rights institutions.

Section II discusses our empirical strategy and the data. Section III provides details on the sample and descriptive statistics. Section IV shows some basic univariate results. Section V provides our main results, contrasting the impact of contracting and property rights institutions on a range of economic outcomes. It also contains a series of robustness checks. Section VI provides additional evidence showing that the measures of contracting institutions are related to transactions between firms, and property rights institutions capture differences in state-society relations. Section VII presents conclusions.

[3] Levine (2005) reviews the literature that finds 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. He also reports results in which legal origin explains the level of financial development, which in turn affects long-run growth.

II. Empirical Strategy and Data

A. *Property Rights and Contracting Institutions*

We define contracting institutions as the rules and regulations governing contracting between ordinary citizens, for example, between a creditor and a debtor or a supplier and its customers. The most important component of contracting institutions is the functioning of the legal system. Differences in both laws and the implementation of laws across countries introduce significant differences in the costs of enforcing contracts and consequently in the equilibrium contracts and transactions. An extreme example of differences in laws affecting contracting institutions is the ban on debt-type contracts in Islamic countries (e.g., Mills and Presley 1999), while the different enforcement of legal protections for investors across postcommunist countries illustrates the differences in the implementation of laws (e.g., Glaeser, Johnson, and Shleifer 2001). In either case, differences in contracting institutions can be sizable. The World Bank (2004, 144, 161), for example, estimates that enforcing a simple commercial debt contract costs over 440 percent of income per capita and requires a process lasting, on average, 495 days in the Dominican Republic, whereas in New Zealand, it costs less than 12 percent of income per capita and requires only 50 days.

We define property rights institutions as the rules and regulations protecting citizens against the power of the government and elites. Therefore, in contrast to contracting institutions, these institutions are related to political and state-society interactions. The most obvious example of these types of institutions is those protecting (or failing to protect) investors against government expropriation. Another example would be regulations that create a nonlevel playing field in favor of large firms with close relationships with the government. There are also major differences in property rights institutions across countries. While government expropriation of business income or assets is deemed virtually impossible in many countries by the international agency Political Risk Services, it is judged as very likely in many sub-Saharan African and Central American countries.

A key difference is in the options that are open to individuals affected by weak contracting and property rights institutions. Suppose that two countries differ in the extent to which their contracting institutions protect a lender against nonpayment of debt. If lenders write the same contract with the debtors in both countries, the consequences of this difference could be striking, including widespread defaults and sizable losses for lenders in the country with weak contracting institutions. However, given these differences in institutions, lenders have a range of recourses. They can increase the interest rates they charge so as to be compensated for the anticipated defaults, they can change the form of contracts, or they can substitute reputation-based arrangements, such as long-term lending agreements, for formal debt contracts.[4] Though imperfect, these potential recourses provide a way of alleviating the effects of weak contracting institutions. In contrast, when property rights institutions fail to protect citizens, such solutions are more difficult. The problem now emanates from the absence of checks on the use of political power by the government and elites, and it is impossible to write contracts restricting the future use of political power, because the ability to enforce all contracts originates with political power. In other words, however unlikely it is that the Coase theorem applies for transactions between private agents, it is much less likely to apply as a political Coase theorem (Acemoglu 2003).

These considerations notwithstanding, it is quite possible that in the data it will be contracting institutions that matter more for economic performance than property rights institutions. This paper is a first attempt to investigate whether this is so.

B. *Basic Specification*

Ignoring nonlinearities, we can write the economic relationship we are interested in identifying as

$$Y_c = \alpha \cdot F_c + \beta \cdot I_c + \mathbf{Z}_c' \cdot \boldsymbol{\gamma}_0 + \epsilon_c, \tag{1}$$

where Y_c is the outcome of interest for country c, F_c is a measure of contracting institutions, I_c is a measure of property rights institutions, and $\mathbf{Z}_c$ is a vector of other controls. The coefficients α and β are the parameters of interest, and $\boldsymbol{\gamma}_0$ is a vector capturing effects of the control variables in $\mathbf{Z}_c$.[5]

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 et al. 2002); the ratio of investment to GDP, which is a measure of whether a society is able to channel money into investments; the amount of private credit as a percentage of GDP as a measure of finance provided through the banking sector and trade credit; and stock market capi-

[4] See the emphasis of, among others, Greif (1989), Ellickson (1991), and McMillan and Woodruff (1999) on the ability of individual agents to use such reputation-based mechanisms. The World Bank's (2004) study has found that in countries such as Malawi, Moldova, and Mozambique, creditors structure contracts so as to be able to seize collateral when a borrower defaults without using the slow standard court procedures (p. 61).

[5] 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.

talization as a percentage of GDP, which provides a measure of equity finance. Because of data availability, in our baseline regressions we use outcomes from the 1990s.

To proxy for contracting institutions, F_c, we use three measures. Our baseline measure of contracting institutions is the index of legal formalism developed in Djankov et al. (2003). This variable measures the operation of contract enforcement through the legal system. Specifically, it quantifies the "formal" procedures associated with collecting on a bounced check, worth 5 percent of the country's annual income per capita, when the defendant has no justification and avoids payment. Both plaintiff and defendant are ordinary citizens without a privileged political position or power. The underlying idea is that a pure "neighbors" model, in which disputes are resolved informally by disinterested local third parties on the basis of fairness criteria, would quickly rule in favor of the plaintiff (see Shapiro 1981; Ellickson 1991). A greater degree of legal formalism creates additional costs for enforcing the contract implied by the check. Djankov et al. (2003) measure the extent of these costs by surveying expert opinions of lawyers in an international network of law firms in 109 countries. They then construct an index of legal formalism that is comparable across countries.

A legal system is more formal, in this index, 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, and other "engagement formalities." 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.

Our next two measures come from the World Bank (2004) study, which uses the same methodology as in Djankov et al. (2003) but deals with a larger commercial debt contract, worth 50 percent of the country's annual income per capita, rather than an unpaid personal check.[6] One is an index of the overall procedural complexity of resolving a court case involving nonpayment of this commercial debt; this measure is similar to but does not include the items related to "other engagement formalities" of legal formalism. The other is the number of distinct procedures involved in the same process. The advantage of these measures is that they are explicitly about commercial transactions and may be more informative regarding the contracting institutions affecting firms. A potential advantage of the original legal formalism measure, on the other hand, is that because the amount involved is smaller, it

[6] An earlier version of our paper also used the measure of legal formalism from Djankov et al. (2003) based on the difficulty of evicting a nonpaying tenant, with very similar results.

may better approximate contracting institutions that are relevant for ordinary citizens.

For the property rights institutions, I_c, we also use three measures. Our base measure is "constraint on executive" from the Polity IV data set, capturing the degree of constraints on politicians and politically powerful elites (Gurr 1997). This measure ranges from one to seven, where a higher score indicates greater constraints. In our main regressions, we use the average of the values over the 1990s.[7] Our second measure is "protection against expropriation" by government, averaged over 1985–95, from Political Risk Services, which was first used in economics by Knack and Keefer (1995). Political Risk Services reports a value between zero and 10 for each country and year, with zero indicating the lowest protection against expropriation. Finally, our third measure is the Heritage Foundation's private property index, also used by La Porta et al. (1999), Beck et al. (2003), and Djankov et al. (2003). This index captures the extent to which private property is protected against both government and other sources of expropriation.[8] The latter two measures are equilibrium outcomes, determined, at least in part, by the actions taken by both the citizens and the elites. This motivates the choice of constraint on executive as our preferred measure. Another advantage of this variable is that it is explicitly about the political procedures constraining the executive, and so it emphasizes the close linkages between property rights institutions and politics. By the same token, however, constraint on executive is not informative about constraints on the behavior of non–political elites and of other branches of the government. We believe that this is not a serious shortcoming, however, since constraints on abuses by politically powerful elites are likely to be greater in societies with more limits on the conduct of the executive (e.g., by avoiding the formation of corrupt links between large firms and politicians).

[7] 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 executive in 1990 and in 1970; its average value in 1950, 1960, and 1970; and its average value over the twentieth century, in all cases with similar results (available on request). While measures spanning the whole twentieth century may be more attractive to capture the cumulative effect of institutions on economic outcomes, we do not have measures for contracting institutions at an earlier date, so we also focus on constraint on executive over the 1990s as our baseline measure.

[8] In fact, though the Heritage Foundation measure is entitled "property rights" and includes primarily information related to property rights institutions, such as freedom from government influence over the judiciary and government expropriation of property, it does also incorporate information from issues closely related to contracting institutions, e.g., the commercial code governing contracts and whether the court system is lax in enforcing contracts. Consequently, this variable may capture some aspects of contracting institutions as well as property rights institutions. We continue to report results with this measure because it has been used by many authors before us.

C. Empirical Strategy

The simplest strategy is to estimate the model in equation (1) using 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 downward attenuation bias. More important, if contracting and property rights institutions are correlated, the effect of the type of institution that is measured with greater error will load onto 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 biases are possible. Our strategy is to estimate equation (1) using two-stage least squares (2SLS) with distinct and plausible instruments for contracting and property rights institutions. 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). A successful instrumental variables strategy would correct not only for the reverse causality and omitted variable biases but also for differential measurement error in the two endogenous variables as long as the measurement errors have the classical form (see, e.g., Wooldridge 2002, chap. 5) and we can estimate the α and β parameters consistently.

The two first stages for our instrumental variables strategy are

$$F_c = \delta_1 \cdot L_c + \eta_1 \cdot M_c + \mathbf{Z}_c' \cdot \boldsymbol{\gamma}_1 + u_{1c},$$
$$I_c = \delta_2 \cdot L_c + \eta_2 \cdot M_c + \mathbf{Z}_c' \cdot \boldsymbol{\gamma}_2 + u_{2c}, \qquad (2)$$

where M_c is either the log mortality rate of European settlers or the log of the indigenous population density in 1500; it conceptually corresponds to the instrument for property rights institutions. We explain these measures in subsection *D* below. The term L_c is a dummy for English legal origin (or, equivalently, for whether or not the country was a British colony) and is the instrument for contracting institutions; it will be discussed further in subsection *E*. The key exclusion restriction is that in the population $\mathrm{Cov}(\epsilon_c, L_c) = \mathrm{Cov}(\epsilon_c, M_c) = 0$, where ϵ_c is the error term in the second-stage equation, (1).

D. Settler Mortality and Population Density in 1500

Our first instrument for property rights institutions is (log) settler mortality in countries that were colonized by European nations between

1500 and 1900. This series was constructed by Acemoglu et al. (2001) primarily on the basis of Gutierrez (1986) and Curtin (1989, 1998). Acemoglu et al. 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, especially during the early stages of colonization. Where the disease environment was favorable for European settlements, colonizers migrated in large numbers and developed political and economic institutions 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 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. 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 (and state-society relations) today. On the basis of this reasoning, we use potential European settler mortality rates as an instrument for current property rights institutions.[9]

The second determinant of European colonization strategy was initial indigenous population 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 to settle themselves and less likely to develop extractive institutions even when they did not settle. Acemoglu et al. (2002) provide evidence that for countries colonized by European powers there is a strong negative relationship between population density

[9] 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 et al. [2001, 2002]). These results are robust to alternative measures of outcomes, institutions, and control variables (Acemoglu et al. 2001).

in 1500 and income per capita today. This relationship is driven by 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 correspond to 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.

E. Legal Origin

The fundamental idea in the line of research of La Porta et al. (1997, 1998) is that countries have distinct "legal origins," which matter for legal, economic, and financial outcomes. These authors draw the strongest distinction between the two great legal traditions: "common-law" countries that were part of the British Empire and "civil-law" countries in which a French, German, or Scandinavian legal system has prevailed.

Whether a country has a common-law or civil-law system is an important determinant of all three measures of contracting institutions described above. In general, the legal origin of a country may be a choice, but for former colonies there are good reasons to regard it as exogenous: the British imposed (English) common-law systems on the countries they colonized, whereas countries colonized by other European powers have (French) civil-law systems. We therefore instrument for the measures of contracting institutions with legal origin in the sample of former European colonies. Djankov et al. (2003) have already shown that in the whole world sample, legal origin explains about 40 percent of the variation in legal formalism. We shall see that the same is true in the sample of former European colonies and also for the other two measures of contracting institutions.

A potential concern with our instrumental variables strategy is that legal origin may affect economic outcomes through channels other than contracting institutions (see, e.g., La Porta et al. 1998; Mahoney 2001; Glaeser and Shleifer 2002). In terms of our framework, in particular, equations (1) and (2), this would amount to $\mathrm{Cov}(\epsilon_c, L_c) \neq 0$, violating our exclusion restriction. 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, $\mathrm{Cov}(\epsilon_c, L_c) \geq 0$ and, in this case, the estimate of the impact of contracting institutions on economic outcomes, α, will be biased upward. Therefore, our results can be interpreted as potential upper bounds on their effects. Moreover, the results reported in table 6 below do not show any evidence of a major effect of legal origin on the outcome variables here.

III. The Samples and Descriptive Statistics

The focus of our analysis is former European colonies. For all these countries we have information on their legal origin (from La Porta et al. [1999]) and an estimate of their population density in 1500 (calculated in Acemoglu et al. [2002]). For smaller subsets of former colonies, we also have data for potential settler mortality rates (from Acemoglu et al. [2001]), for measures of legal formalism (from Djankov et al. [2003]), and for measures of procedural complexity and the number of procedures needed to collect a commercial debt (from World Bank [2004]). For 71 former colonies we know the number of procedures for collecting a commercial debt (this is the measure of contracting institutions for which we have the most data). Of these, 25 are common-law "English legal origin" countries and 46 have a French legal origin (civil law).[10]

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 to (within half a standard deviation or less) the values for all countries. Column 3 reports mean values for former colonies with English legal origin, and columns 4 and 5 break these down into those with low and high settler mortality (with the break points given by values that divide all ex-colonies roughly into two halves). Columns 6–8 provide parallel data for former colonies with French legal origin.

The first three rows in table 1 report the three measures of contracting institutions: legal formalism, procedural complexity, and the number of procedures, with all three measures assigning higher scores to worse contracting institutions. Rows 4–6 report our three measures of property rights institutions: constraint on executive, protection against expropriation, and private property, with the last index transformed so that all three measures assign higher scores when there is more constraint on politicians or stronger perceived property rights protection. Former colonies with lower settler mortality have, on average, better property

[10] We do not treat former League of Nations mandate countries, such as Bahrain, Oman, the United Arab Emirates, and Yemen, as ex-colonies 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 toward 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 us to construct settler mortality rates for the League of Nations mandate countries. Including these countries and using population density in 1500 as the instrument for property rights institutions gives results very similar to those reported in the text.

TABLE 1
DESCRIPTIVE STATISTICS

	World Sample (1)	Ex-Colonies Sample (2)	English Ex-Colonies (3)	English Ex-Colonies: Low Settler Mortality (4)	English Ex-Colonies: High Settler Mortality (5)	French Ex-Colonies (6)	French Ex-Colonies: Low Settler Mortality (7)	French Ex-Colonies: High Settler Mortality (8)
Legal formalism	3.67	3.78	2.77	2.46	2.98	4.65	4.77	4.48
	(1.07)	(1.24)	(.88)	(.94)	(.79)	(.75)	(.84)	(.62)
Procedural complexity	5.77	5.94	4.53	4.54	4.53	6.72	6.87	6.60
	(1.37)	(1.54)	(1.03)	(1.04)	(1.06)	(1.19)	(1.33)	(1.07)
Number of procedures	27.19	28.73	20.4	19.67	21.08	33.26	30.8	35.15
	(12.09)	(12.89)	(7.37)	(5.18)	(9.12)	(13.04)	(10.85)	(14.43)
Constraint on executive	4.47	4.15	4.48	5.58	3.75	3.99	5.02	3.33
	(2.09)	(1.91)	(2.06)	(1.51)	(2.08)	(1.78)	(1.73)	(1.49)
Average protection against risk of expropriation	7.07	6.39	6.93	7.73	6.27	6.02	6.46	5.61
	(1.81)	(1.47)	(1.70)	(1.73)	(1.40)	(1.16)	(.94)	(1.21)
Private property	3.3	3.04	3.54	3.79	3.38	2.67	3.15	2.32
	(1.18)	(1.05)	(1.07)	(1.19)	(.97)	(.88)	(.59)	(.91)
Log GDP per capita in 1995 (PPP measure)	8.35	7.91	8.17	8.91	7.80	7.71	7.26	8.35
	(1.10)	(1.00)	(1.14)	(1.11)	(.98)	(.83)	(.64)	(.64)
Average investment-GDP ratio	14.73	12.30	14.86	18.76	12.91	10.53	12.77	9.03
	(7.89)	(7.21)	(8.37)	(9.65)	(7.04)	(5.49)	(4.73)	(5.51)
Credit to the private sector	.41	.36	.48	.79	.31	.26	.35	.19
	(.39)	(.35)	(.44)	(.55)	(.25)	(.21)	(.19)	(.20)
Stock market capitalization	.22	.17	.30	.67	.07	.04	.11	.03
	(.37)	(.37)	(.51)	(.68)	(.11)	(.14)	(.17)	(.09)
Log settler mortality	n.a.	4.69	4.25	3.10	5.48	4.93	4.12	5.59
		(1.20)	(1.49)	(.70)	(1.06)	(.92)	(.37)	(.68)
Log population density in 1500	n.a.	.52	.25	−.27	.51	.75	.33	.99
		(1.53)	(1.77)	(2.62)	(1.11)	(1.30)	(1.70)	(.92)

NOTE.—Mean values, with standard deviations in parentheses. High and low settler mortality are defined as above- and below-median values for all former colonies. For detailed sources and definitions, see App. table A1.

rights institutions, whereas those with an English legal origin have worse contracting institutions.

Rows 7–10 cover our four main dependent variables. Row 7 reports log of GDP per capita (in purchasing power parity [PPP] terms) in 1995. We can see a clear relationship between settler 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 6 shows that English legal origin colonies have higher average income per capita than French legal origin colonies. Row 8 reports the data on the ratio of private investment to GDP, measured in current prices and averaged over the 1990s (from the Penn World Tables). Investment ratios are higher in former colonies with lower settler mortality rates and higher in former colonies with English legal origin.

We use two standard measures of financial development: the total amount of credit to the private sector in the economy as a percentage of GDP in 1998 (row 9) and stock market capitalization (row 10).[11] Former colonies with lower settler mortality rates and 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 (total value of outstanding shares) as a percentage of GDP averaged over 1990–95, from Beck et al. (2001). Former colonies with lower settler mortality rates and English legal origin have substantially higher stock market capitalizations.

The remaining rows give descriptive statistics for other variables we use below.

IV. Univariate Regressions

To provide a benchmark, table 2 reports univariate regressions documenting the relationship between the measures of contracting institutions or of property rights institutions and the outcome variables. In this table, each cell corresponds to a separate regression. In columns 1–3 of panel A the dependent variable is log GDP per capita in 1995. Columns 1 and 2 report OLS regressions using legal formalism, procedural complexity, and the number of procedures. Column 1 uses data from all countries for which we have GDP data and the corresponding

[11] 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 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, e.g., Levine 1997, 2005; Rajan and Zingales 1998).

TABLE 2

Contracting and Property Rights Institutions: GDP per Capita, Investment, Credit, and Stock Market Capitalization

	World: OLS (1)	Ex-Colonies Sample OLS (2)	Ex-Colonies Sample 2SLS (3)	World: OLS (4)	Ex-Colonies Sample OLS (5)	Ex-Colonies Sample 2SLS (6)
Panel A	Dependent Variable: Log GDP per Capita in 1995			Dependent Variable: Average Ratio of Investment to GDP in 1990s		
Legal formalism	−.28	−.21	−.18	−1.90	−1.19	−1.77
	(.10)	(.10)	(.14)	(.69)	(.71)	(.94)
Procedural complexity	−.12	−.047	−.141	−1.19	−.56	−2.13
	(.07)	(.083)	(.122)	(.50)	(.56)	(.87)
Number of procedures	−.03	−.016	−.026	−.22	−.12	−.34
	(.01)	(.010)	(.021)	(.06)	(.07)	(.15)
Panel B	Dependent Variable: Credit to the Private Sector in 1998			Dependent Variable: Stock Market Capitalization, Average over 1990–95		
Legal formalism	−.16	−.14	−.14	−.17	−.17	−.16
	(.04)	(.03)	(.05)	(.03)	(.04)	(.05)
Procedural complexity	−.08	−.056	−.120	−.089	−.072	−.156
	(.03)	(.029)	(.044)	(.025)	(.031)	(.047)
Number of procedures	−.01	−.0077	−.021	−.0093	−.0078	−.027
	(.003)	(.0036)	(.008)	(.0033)	(.0038)	(.009)
Panel C	Dependent Variable: Log GDP per Capita in 1995			Dependent Variable: Average Ratio of Investment to GDP in 1990s		
Constraint on executive	.33	.32	.76	1.61	1.40	4.16
	(.04)	(.05)	(.15)	(.30)	(.42)	(1.04)
Average protection against risk of expropriation	.56	.52	1.05	3.17	3.00	5.50
	(.04)	(.06)	(.19)	(.33)	(.48)	(1.12)
Private property	.74	.69	1.57	3.97	3.72	9.23
	(.06)	(.09)	(.32)	(.53)	(.72)	(2.23)
Panel D	Dependent Variable: Credit to the Private Sector in 1998			Dependent Variable: Stock Market Capitalization, Average over 1990–95		
Constraint on executive	.08	.08	.25	.06	.06	.21
	(.02)	(.02)	(.06)	(.02)	(.02)	(.06)
Average protection against risk of expropriation	.15	.16	.37	.11	.14	.30
	(.02)	(.03)	(.08)	(.02)	(.03)	(.08)
Private property	.23	.23	.54	.19	.21	.43
	(.03)	(.03)	(.12)	(.03)	(.04)	(.10)

Note.—Standard errors are in parentheses. All regressions are cross-sectional OLS or 2SLS, with one observation per country. Each cell reports results from a separate regression; sample sizes differ across regressions and are reported in Acemoglu and Johnson (2003). In cols. 3 and 6 of panels A and B, the measure of contracting institutions is instrumented using a dummy variable for whether a country has an English legal origin. In cols. 3 and 6 of panels C and D, the measure of property rights institutions is instrumented using log settler mortality. For detailed sources and definitions, see App. table A1.

measure of contracting institutions; column 2 limits the sample to former European colonies. In both samples, there is a significant and relatively large coefficient on the legal formalism measure (row 1). Quantitatively, a one-standard-deviation increase in legal formalism is associated with approximately a 30 percent decline in GDP per capita today.[12] The coefficient estimates with the two other measures of contracting institutions are also negative, though not always significant (rows 2 and 3).

Column 3 reports the second stage of a univariate 2SLS regression in which each of the measures of contracting institutions is (separately) instrumented by legal origin. In all cases there is a very strong first stage, which we do not report to save space (see table 3 below).[13] In the second stage the coefficients on the measures of contracting institutions are insignificant, though they remain quantitatively large; for example, with legal formalism, the point estimate, −0.18, implies that a one-standard-deviation increase in legal formalism will reduce log GDP per capita by 0.20 of a standard deviation.

In columns 4–6 of panel A, the dependent variable is the average investment-GDP ratio in the 1990s. There is a significant negative coefficient on legal formalism in the OLS specification of column 4 and similar, though not always statistically significant, results for the other two measures. The 2SLS estimates in column 6 are negative and larger than the OLS coefficient estimates for the corresponding sample of excolonies. For legal formalism, the estimate is significant at the 10 percent level, whereas for the other two measures, the estimates are significant at 5 percent.

Panel B shows significant effects of all three measures of contracting institutions on financial development in both OLS and instrumental variables. In columns 1–3 of panel B the dependent variable is credit to the private sector as a percentage of GDP in 1998, and in columns 4–6 it is stock market capitalization as a percentage of GDP.

Panel C reports parallel univariate specifications using our measures for property rights institutions, constraint on executive, protection against expropriation, and the private property index as the independent variables and log GDP per capita and the investment-GDP ratio as

[12] In our calculations of magnitudes throughout we use standard deviations for the sample of former colonies from table 1. One standard deviation of legal formalism is 1.24; thus the OLS and 2SLS estimates imply changes in the range 26–34 percent of the standard deviation of log GDP, which is approximately one.

[13] With legal origin, the first-stage R^2 is 0.58; with procedural complexity, it is 0.48; and with the number of procedures, it is 0.23. These first-stage results confirm the strong relationship between legal origin and contracting institutions emphasized in Djankov et al. (2003).

the dependent variables. Settler mortality is used as the instrument.[14] There are again strong first-stage relationships, which we omit to save space.[15] In columns 1–3, where log GDP per capita is the dependent variable, both the OLS and instrumental variables estimates show a large effect of property rights institutions on GDP per capita, but the instrumental variables estimates are more than double the OLS coefficients.[16] Columns 4–6, in turn, show large and statistically significant effects of various property rights institutions on the investment-GDP ratio. Finally, panel D shows significant effects of the three measures of property rights institutions on financial development.

Overall, table 2 shows strong effects of property rights institutions on GDP per capita, investment, credit, and stock market development in both univariate OLS and instrumental variables regressions. It also shows strong effects of contracting institutions on credit and stock market development, with more limited, but still substantial, effects on GDP per capita and the investment-GDP ratio. We next investigate how these results change when the two sets of variables are included simultaneously.

V. Contracting versus Property Rights Institutions

A. *First-Stage Results*

We start by showing the first-stage relationships between contracting and property rights institutions and our various instruments in figures 1 and 2 and table 3. Figure 1 plots the partial correlation between our measures of contracting and property rights institutions and the instruments, log settler mortality and English legal origin. Figure 1*a*, for example, depicts the residuals from regressing constraint on executive on English legal origin against 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 slope of the regression line corresponds to the coefficient on settler mortality in the first-stage re-

[14] The results are very similar when log population density in 1500 is used as the instrument (see Acemoglu and Johnson 2003). We report regressions using log population density in 1500 as an instrument in tables 3–6 and 9.

[15] For example, R^2 of the first stage for constraint on executive on log settler mortality is 0.27.

[16] This is similar to the results in Acemoglu et al. (2001). 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 here, creating potential downward attenuation bias. The instrumental variables strategy corrects for this type of attenuation bias. Acemoglu et al. show that the magnitude of the difference between OLS and instrumental variables coefficients is consistent with the magnitude of the measurement error across the proxies for (property rights) institutions.

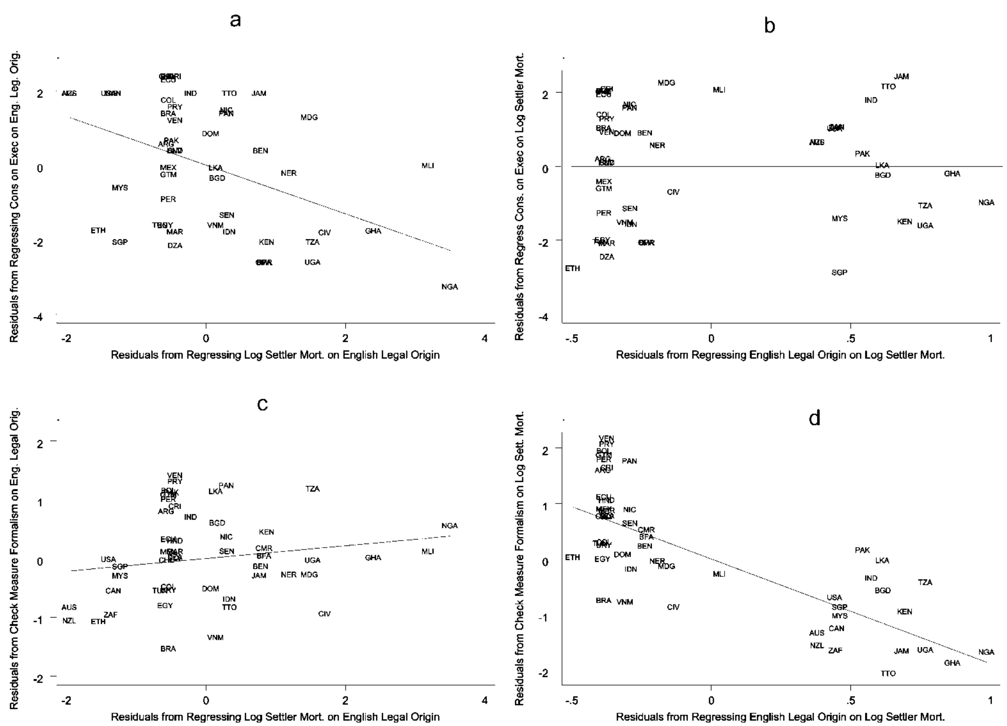

Fig. 1.—Partial correlation of constraint on executive and check measure of formalism with log settler mortality and English legal origin

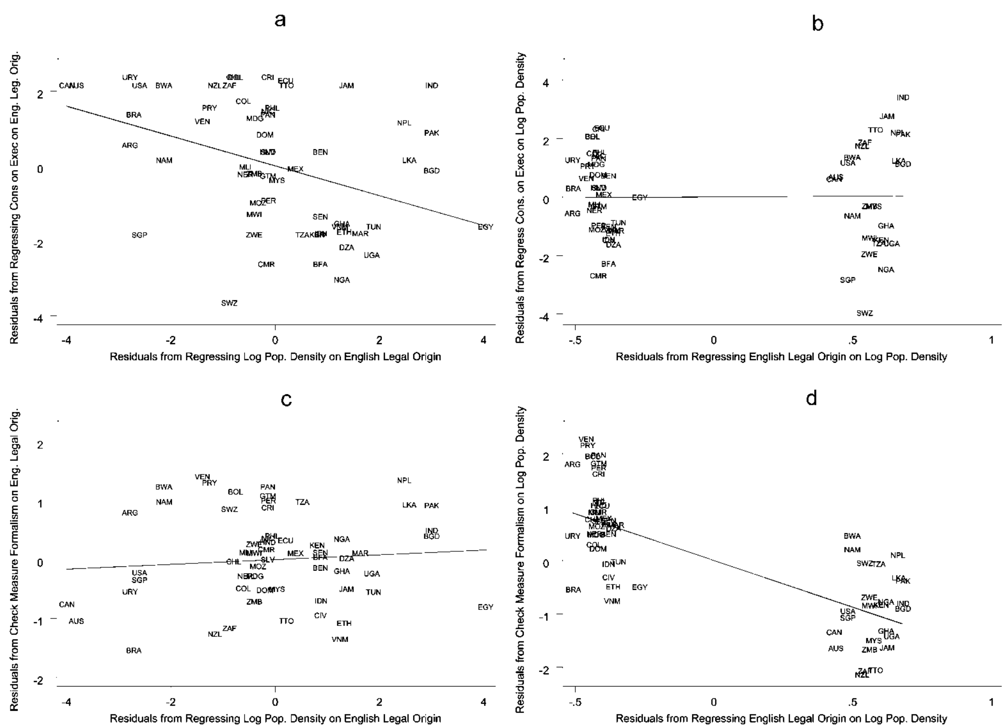

FIG. 2.—Partial correlation of constraint on executive and check measure of formalism with log population density in 1500 and English legal origin

TABLE 3
First-Stage Regressions for Contracting and Property Rights Institutions
(OLS, Sample of Ex-Colonies)

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A. Measure of Contracting Institutions					
	Dependent Variable: Legal Formalism		Dependent Variable: Procedural Complexity		Dependent Variable: Number of Procedures	
English legal origin	−1.98	−1.79	−2.28	−2.24	−11.29	−12.39
	(.23)	(.20)	(.34)	(.29)	(3.31)	(2.88)
Log settler mortality	.09		−.08		1.59	
	(.09)		(1.32)		(1.29)	
Log population density in 1500		.04		−.13		−.38
		(.06)		(.86)		(.84)
R^2 in first stage	.64	.58	.47	.47	.23	.22
Observations	53	64	60	68	61	69
	Panel B. Measure of Property Rights Institutions					
	Dependent Variable: Constraint on Executive		Dependent Variable: Protection against Expropriation		Dependent Variable: Private Property	
English legal origin	−.002	.05	.60	.87	.72	.73
	(.48)	(.43)	(.31)	(.30)	(.22)	(.18)
Log settler mortality	−.66		−.71		−.30	
	(.19)		(.12)		(.09)	
Log population density in 1500		−.40		−.36		−.29
		(.13)		(.09)		(.05)
R^2 in first stage	.21	.15	.50	.35	.37	.47
Observations	51	60	51	57	52	60

Note.—Standard errors are in parentheses. All regressions are cross-sectional OLS with one observation per country. For detailed sources and definitions, see App. table A1.

gression of constraint on executive on settler mortality and English legal origin). Figure 1*b* shows that, after we partial out the effects of log settler mortality, there is approximately no relationship between constraint on executive and English legal origin. Figures 1*c* and *d*, on the other hand, show a strong relationship between legal formalism and legal origin and a much weaker and statistically insignificant relationship between this measure of contracting institutions and log settler mortality. Figure 2 shows a similar relationship using population density in 1500.

Table 3 shows these first stages in regression form. Panel A pertains to measures of contracting institutions and panel B to property rights institutions. In all cases, we take the largest sample for which we have one of the four outcome variables. Columns 1 and 2 confirm the findings depicted in figures 1 and 2: English legal origin has a large and precisely estimated effect on legal formalism and no significant effect on constraint on executive, whereas settler mortality and population density have a large effect on the constraint on executive and no impact on legal formalism.

Columns 3–6 in panel A show that the large effect of English legal origin and the lack of an effect from settler mortality and population density in 1500 on the contracting institutions are robust with the other two measures. Panel B, however, shows that when the alternative measures of property rights institutions—protection against expropriation and the private property index—are used, English legal origin has a statistically significant, but considerably weaker, effect on property rights institutions. We discuss this pattern further below.

Overall, figures 1 and 2 and table 3 show that there are strong first stages for both contracting and property rights institutions originating from colonial history, and these first stages take a nice separable form whereby English legal origin mainly affects contracting institutions, and settler mortality and population density before colonial times mainly affect property rights institutions. It appears that the way in which countries were colonized, but *not* who colonized them, is a robust determinant of property rights institutions, whereas who colonized, but *not* the details of colonization strategy, shapes contracting institutions.

B. *Main Results*

Table 4 reports results for log GDP per capita and the investment to GDP ratio, and table 5 covers the private credit to GDP ratio and stock market capitalization. Both tables have a separate panel for each dependent variable and six columns with various combinations of the measures for contracting institutions and property rights institutions, and different combinations of the instruments. The corresponding OLS regressions are reported at the bottom of each panel. The first stages are very similar to those in table 3 (differing only by a few countries depending on data availability) and are not reported to save space.

In column 1 of panel A of table 4, where we use constraint on executive and legal formalism and the instruments are settler mortality and English legal origin, the coefficient on constraint on executive is 0.99 (with a standard error of 0.29). This implies that a one-standard-deviation improvement in property rights institutions will lead to a 1.9-standard-deviation increase in GDP per capita. In contrast, the coefficient on legal formalism is not significant and has the "wrong" sign: countries with more formalism actually have higher GDP per capita. Notice 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 panel A, row 1, col. 3 of that table). This change in the implied effect of legal formalism on long-run growth suggests that in OLS or in regressions that do not control for property rights institutions, the

TABLE 4
CONTRACTING VS. PROPERTY RIGHTS INSTITUTIONS: GDP PER CAPITA AND INVESTMENT-GDP RATIO (2SLS)

	Instrument for Property Rights Institutions					
	Log Settler Mortality (1)	Log Population Density (2)	Log Settler Mortality (3)	Log Settler Mortality (4)	Log Settler Mortality (5)	Log Settler Mortality (6)
	Panel A. Dependent Variable: Log GDP per Capita, Second Stage of 2SLS					
Legal formalism	.05	−.002			.35	.85
	(.24)	(.21)			(.15)	(.45)
Procedural complexity			.097			
			(.17)			
Number of procedures				.02		
				(.04)		
Constraint on executive	.99	.88	.84	.88		
	(.29)	(.27)	(.18)	(.23)		
Average protection against risk of expropriation					.99	
					(.16)	
Private property						2.45
						(.81)
	Results in Equivalent OLS Specification					
Measure of contracting institutions	−.16	−.13	−.050	−.013	.11	.01
	(.10)	(.10)	(.07)	(.009)	(.09)	(.10)
Measure of property rights institutions	.31	.29	.34	.32	.63	.74
	(.07)	(.07)	(.06)	(.06)	(.08)	(.14)
Observations	51	60	60	61	51	52
	Panel B. Dependent Variable: Investment-GDP Ratio, Second Stage of 2SLS					
Legal formalism	−.80	−1.34			.57	3.83
	(1.55)	(1.37)			(1.08)	(2.52)
Procedural complexity			−.60			
			(1.10)			
Number of procedures				−.08		
				(.23)		
Constraint on executive	4.70	4.24	4.21	4.06		
	(1.87)	(1.77)	(1.20)	(1.44)		
Average protection against risk of expropriation					4.68	
					(1.11)	
Private property						13.16
						(4.57)
	Results in Equivalent OLS Specification					
Measure of contracting institutions	−1.05	−.94	−.50	−.08	.67	.14
	(.83)	(.76)	(.60)	(.07)	(.71)	(.78)
Measure of property rights institutions	1.08	1.00	1.5	1.31	3.88	4.68
	(.57)	(.51)	(.48)	(.49)	(.65)	(1.08)
Observations	51	60	60	61	51	52

NOTE.—Standard errors are in parentheses. All regressions are cross-sectional with one observation per country. The main regressions are 2SLS, with results from corresponding OLS specifications at the bottom of each panel. The instruments are English legal origin in all columns; in cols. 1 and 3–6, log settler mortality; and in col. 2, log population density in 1500. First stages are similar to those in table 3. For detailed sources and definitions, see App. table A1.

TABLE 5

Contracting vs. Property Rights Institutions: Private Credit and Stock Market Capitalization (2SLS)

	Instrument for Property Rights Institutions					
	Log Settler Mortality (1)	Log Population Density (2)	Log Settler Mortality (3)	Log Settler Mortality (4)	Log Settler Mortality (5)	Log Settler Mortality (6)
	Panel A. Dependent Variable: Credit to Private Sector, Second Stage of 2SLS					
Legal formalism	−.08 (.08)	−.08 (.06)			−.01 (.07)	.16 (.14)
Procedural complexity			−.05 (.06)			
Number of procedures				−.010 (.012)		
Constraint on executive	.27 (.10)	.17 (.07)	.24 (.06)	.22 (.07)		
Average protection against risk of expropriation					.28 (.07)	
Private property						.70 (.25)
	Results in Equivalent OLS Specification					
Measure of contracting institutions	−.13 (.04)	−.11 (.04)	−.059 (.030)	−.006 (.003)	−.09 (.04)	−.08 (.04)
Measure of property rights institutions	.06 (.03)	.06 (.02)	.08 (.02)	.071 (.02)	.13 (.04)	.21 (.05)
Observations	51	60	60	61	51	52
	Panel B. Dependent Variable: Stock Market Capitalization, Second Stage of 2SLS					
Legal formalism	−.16 (.07)	−.14 (.05)			−.10 (.07)	.04 (.10)
Procedural complexity			−.11 (.06)			
Number of procedures				−.022 (.013)		
Constraint on executive	.20 (.09)	.13 (.07)	.19 (.06)	.14 (.08)		
Average protection against risk of expropriation					.21 (.07)	
Private property						.54 (.20)
	Results in Equivalent OLS Specification					
Measure of contracting institutions	−.17 (.04)	−.15 (.04)	−.08 (.03)	−.006 (.004)	−.15 (.05)	−.08 (.04)
Measure of property rights institutions	.39 (.03)	.04 (.03)	.055 (.03)	.05 (.03)	.10 (.04)	.21 (.06)
Observations	50	59	59	59	50	51

Note.—Standard errors are in parentheses. All regressions are cross-sectional with one observation per country. The main regressions are 2SLS, with results from corresponding OLS specifications at the bottom of each panel. The instruments are English legal origin in all columns; in cols. 1 and 3–6, log settler mortality; and in col. 2, log population density in 1500. First stages are similar to those in table 4. For detailed sources and definitions, see App. table A1.

importance of contracting institutions is exaggerated because they capture some of the cross-country differences in the protection of property rights.

Column 2, which uses log population density in 1500 as the instrument for property rights institutions instead of log settler mortality, contains nine more observations and shows results consistent with those in column 1. For example, the estimated coefficient for constraint on executive is 0.88 (standard error 0.27) in column 2, compared with 0.99 (standard error 0.29) in column 1.

The other columns show similar results using the other measures of contracting institutions and property rights institutions. All three measures of property rights institutions have large effects on income per capita today, whereas contracting institutions appear to have little effect on income. In fact, the coefficients on legal formalism in columns 5 and 6 are positive and statistically significant, indicating that worse contracting institutions are associated with higher income per capita in the long run. In sum, there is no evidence that weak contracting institutions have a significant negative effect on long-run economic performance.

Panel B shows similar results for the investment to GDP ratio. There is a robust positive effect of property rights institutions and no evidence that contracting institutions affect investment. According to the estimate in column 1, a one-standard-deviation strengthening of property rights causes a 1.2-standard-deviation increase in the investment to GDP ratio.

Panel A of table 5 shows a strong effect of property rights institutions on credit to the private sector. The coefficient of 0.27 in column 1 implies that a one-standard-deviation increase in constraint on executive causes a 1.4-standard-deviation increase in the credit to GDP ratio. Contracting institutions, on the other hand, do not appear to be a significant determinant of credit: the coefficient estimates for the effect of contracting institutions are insignificant in all the instrumental variables specifications, are very small, and sometimes have the wrong sign. This again contrasts with the univariate results of table 2.

The pattern in panel B of table 5, where we look at stock market capitalization, is different. Property rights institutions still influence stock market capitalization (though significance falls to the 10 percent level in cols. 2 and 4), but now there is also a significant effect of contracting institutions. The estimates of the effect from our measures of contracting institutions on stock market capitalization are always negative (with the exception of col. 6), and in columns 1–4, they are statistically significant. The effect of a one-standard-deviation increase in constraint on executive (with the coefficient of −0.16 in col. 1) is about a one-standard-deviation increase in stock market capitalization, whereas the effect of a one-standard-deviation reduction in legal formalism is to increase stock market capitalization by one-half of its standard deviation.

Overall, the results in this subsection 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, contracting institutions appear to have an impact only on stock market development; for the other outcomes, their effect is not significantly different from zero. Moreover, for all variables, the effect of contracting institutions is quantitatively much smaller than the effect of property rights institutions. The rest of this section shows that this pattern is robust.

C. Semi-Reduced-Form Results

A potential concern with our approach is that English legal origin might be affecting economic and financial outcomes through channels other than legal formalism. One way to address this issue is to examine the semi-reduced-form specification, in which property rights institutions are instrumented but English legal origin enters the second-stage regression directly (and is naturally also included in the first-stage regression).

Table 6 reports results using this approach for all four of our outcome variables. The odd-numbered columns use log settler mortality as the instrument and the even-numbered columns use log population density in 1500. Panel A uses constraint on executive as the measure of property rights institutions, and panels B and C use the protection against expropriation and private property measures, respectively. The first stages are essentially the same as those in table 3 and are omitted.

The estimated effect of constraint on executive on income per capita (panel A) is large and has about the same order of magnitude as in tables 2 and 4. English legal origin is not significant. In panels B and C, the coefficients on the alternative property rights measures are similar to those in table 2, indicating a large positive effect. Interestingly, in both panels B and C, there is also a significant negative coefficient on English legal origin. Recall that in table 3 English legal origin has a positive effect on these measures of property rights (but not on constraint on executive), so the negative second-stage coefficients here ensure that the overall effect of English legal origin on GDP per capita—direct plus indirect through property rights—is approximately zero.

The remainder of table 6 shows a similar pattern. All three measures of property rights have a significant positive effect on the outcomes of interest, irrespective of which instrument we use. English legal origin has no significant positive effect in any of the specifications, except on stock market capitalization in columns 7 and 8 of panel A.

Overall, these semi-reduced-form regressions show no evidence of a positive effect of English legal origin on the outcomes of interest here.

TABLE 6
SEMI–REDUCED FORMS: SAMPLE OF EX-COLONIES

	Dependent Variable: Log GDP per Capita		Dependent Variable: Investment-GDP Ratio		Dependent Variable: Credit to the Private Sector		Dependent Variable: Stock Market Capitalization	
	Instrument: Log Settler Mortality (1)	Instrument: Log Population Density (2)	Instrument: Log Settler Mortality (3)	Instrument: Log Population Density (4)	Instrument: Log Settler Mortality (5)	Instrument: Log Population Density (6)	Instrument: Log Settler Mortality (7)	Instrument: Log Population Density (8)
	Panel A. With Constraint on Executive, Second Stage from 2SLS							
English legal origin	−.23	−.28	.92	1.04	−.11	.10	.24	.21
	(.37)	(.31)	(2.56)	(2.17)	(.13)	(.10)	(.13)	(.10)
Constraint on executive	.84	.74	4.23	3.92	.24	.15	.19	.13
	(.18)	(.17)	(1.23)	(1.20)	(.06)	(.05)	(.06)	(.06)
Observations	61	69	61	69	61	69	59	66
	Panel B. With Protection against Expropriation, Second Stage from 2SLS							
English legal origin	−.81	−.91	−1.67	−2.68	−.04	−.04	.13	.08
	(.29)	(.33)	(1.98)	(2.25)	(.13)	(.13)	(.13)	(.14)
Average protection against risk of expropriation	1.00	1.05	5.07	5.84	.31	.27	.24	.23
	(.15)	(.21)	(.96)	(1.38)	(.07)	(.08)	(.06)	(.08)
Observations	57	63	58	64	57	63	56	62

	Panel C. With Private Property, Second Stage from 2SLS							
English legal origin	−1.54	−.90	−5.53	−2.67	−.26	−.04	−.01	.08
	(.57)	(.31)	(3.68)	(2.41)	(.19)	(.11)	(.15)	(.11)
Private property	1.87	1.27	10.11	7.04	.55	.32	.41	.28
	(.40)	(.22)	(2.58)	(1.76)	(.14)	(.08)	(.11)	(.08)
Observations	58	64	59	65	58	64	57	63

NOTE.—Standard errors are in parentheses. All regressions are cross-sectional with one observation per country. The specification is 2SLS, with English legal origin treated as exogenous and included in the first stage (not shown). For detailed sources and definitions, see App. table A1.

The only potential exception is a positive effect on stock market capitalization in some specifications (which is presumably working through contracting institutions as in the specifications in table 3).

D. *Alternative Samples*

Table 7 estimates the basic regressions of tables 4 and 5 using alternative samples. The first-stage regressions are reported in full only in panel A (they are very similar for panel B). All columns use constraint on executive instrumented with log settler mortality and legal formalism instrumented with English legal origin. Results using other combinations of right-hand-side variables and instruments are very similar.

In columns 1 and 5, we restrict the sample to common-law countries (i.e., former British colonies) and in columns 2 and 6, to French legal origin countries. 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 subsamples, 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 0.40 vs. 0.12, in a comparison of cols. 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 and the investment-GDP ratio is approximately the same within "legal families" as it is across all ex-colonies (compare with table 4). For credit and stock market development there is a stronger effect among common-law countries.

Columns 3 and 7 drop the four "neo-Europes," that is, the richest former colonies with geographic conditions the closest to those in western Europe (Crosby 1972): Australia, Canada, New Zealand, and the United States. 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 constraint on executive goes up slightly in the GDP per capita, investment, and private credit regressions and increases by about 50 percent for stock market capitalization. The effect of contracting institutions shows the same pattern as before: legal formalism is significant only for stock market capitalization and almost significant for log GDP per capita, but again with the wrong sign.

Columns 4 and 8 in panel A show similar results for GDP per capita and the investment-GDP ratio when the sample is limited to countries above median world income, establishing 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 regressions, there are some outliers with the financial development outcomes. Columns 4 and 8 in panel B drop outliers from the credit and stock market capitalization regressions. 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 coefficient on constraint on executive falls from 0.27 in table 5 (col. 1 of panel A) to 0.22 in table 7 (col. 4 of panel B) and from 0.20 in table 5 (col. 1 of panel B) to 0.10 in table 7 (col. 8 of panel B). In both cases, however, the standard errors also decline, so the effect remains highly significant. It is notable that once these outliers are dropped, contracting institutions appear to have a more limited effect on stock market development (and still no effect on credit to the private sector).

E. Additional Control Variables

Columns 1 and 4 (panels A and B) of table 8 control for religion; columns 2 and 5 control for latitude; and columns 3 and 6 control for a number of macroeconomic policies (or policy outcomes), log average inflation, government consumption, and exchange rate overvaluation, all defined over 1970–97.[17] 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 table 3. We again focus on constraint on executive to measure property rights, legal formalism to proxy for contracting institutions, and log settler mortality as the instrument for property rights institutions. The results are similar with the other measures of institutions and with log population density.

Some scholars have suggested that there may be a link between religion and financial development (e.g., Stulz and Williamson 2003). To investigate this issue, we use the measure from La Porta et al. (1999) with the percentage of the population that is Catholic, Protestant, Muslim, and "other." These shares add to 100, and we treat Catholic as the

[17] Another potential control is the level of human capital (e.g., average years of schooling). 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 results similar to those in our baseline estimates. However, when we use the constraint on executive measure, there is too much multicollinearity.

TABLE 7
Contracting vs. Property Rights Institutions: Alternative Samples

Panel A	Dependent Variable: Log GDP per Capita in 1995				Dependent Variable: Investment-GDP Ratio in 1990s			
	Common-Law Countries (1)	French Legal Origin Countries (2)	Without Neo-Europes (3)	Countries Above Median World Income (4)	Common-Law Countries (5)	French Legal Origin Countries (6)	Without Neo-Europes (7)	Countries Above Median World Income (8)
	Second-Stage Regression							
Legal formalism			.18	.10			−1.22	.71
			(.26)	(.19)			(1.95)	(2.42)
Constraint on executive	.75	.82	.96	.61	3.91	3.22	5.43	5.79
	(.19)	(.30)	(.38)	(.20)	(1.70)	(1.45)	(2.80)	(3.27)
	First Stage for Legal Formalism							
English legal origin			−1.77	−2.10			−1.77	−2.10
			(.24)	(.31)			(.24)	(.31)
Log settler mortality			.03	.07			.03	.07
			(.11)	(.16)			(.11)	(.16)
R^2 in first stage			.55	.64			.55	.64
	First Stage for Constraint on Executive							
English legal origin			−.20	.36			−.20	.36
			(.52)	(.58)			(.52)	(.58)
Log settler mortality	−.82	−.65	−.53	−.7	−.82	−.65	−.53	−.7
	(.21)	(.26)	(.23)	(.29)	(.21)	(.26)	(.23)	(.29)
R^2 in first stage	.40	.12	.11	.21	.40	.12	.11	.21
Observations	24	48	47	41	24	48	47	41

Panel B	Dependent Variable: Credit to the Private Sector as a Percentage of GDP				Dependent Variable: Stock Market Capitalization as a Percentage of GDP			
	Common-Law Countries (1)	French Legal Origin Countries (2)	Without Neo-Europes (3)	Without Outliers (4)	Common-Law Countries (5)	French Legal Origin Countries (6)	Without Neo-Europes (7)	Without Outliers (8)
Legal formalism			−.10	−.04			−.23	−.06
			(.10)	(7.00)			(.10)	(.03)
Constraint on executive	.27	.16	.31	.22	.21	.07	.32	.10
	(.09)	(.07)	(.14)	(.08)	(.10)	(.03)	(.15)	(.03)
Observations	25	48	47	48	24	44	46	47

Note.—Standard errors are in parentheses. All regressions are cross-sectionl, 2SLS, with one observation per country. The instruments in cols. 3, 4, 7, and 8 are a dummy variable for whether a country has an English legal origin and in all columns log settler mortality. The first stage in panel B is very similar to that in panel A. Cols. 3 and 7 drop the four "neo-Europes": Australia, Canada, New Zealand, and the United States. In cols. 4 and 8 of panel A, we drop all countries below median world income (using GDP per capita, PPP, in 1995). In cols. 4 and 8 of panel B, we drop outliers. For detailed sources and definitions, see App. table A1.

TABLE 8

Contracting vs. Property Rights Institutions: Other Control Variables

	Religion (1)	Latitude (2)	Macro (3)	Religion (4)	Latitude (5)	Macro (6)
Panel A	Dependent Variable: Log GDP per Capita in 1995			Dependent Variable: Investment-GDP Ratio		
	Second Stage					
Legal formalism	.24	.06	−.02	−1.88	−.68	−1.26
	(.77)	(.27)	(.28)	(4.24)	(1.88)	(1.99)
Constraint on executive	1.31	1.11	1.07	5.57	6.48	5.20
	(.63)	(.44)	(.43)	(3.49)	(3.07)	(3.12)
p-value for religion	[.59]			[.44]		
Latitude		−1.51			−23.9	
		(2.63)			(18.3)	
p-value for macro variables			[.45]			[.76]
	First Stage for Legal Formalism					
English legal origin	−1.08	−1.89	−1.95	−1.08	−1.89	−1.95
	(.26)	(.23)	(.25)	(.26)	(.23)	(.25)
Log settler mortality	.16	.08	.09	.16	.08	.09
	(.08)	(.10)	(.12)	(.08)	(.10)	(.12)
R^2 in first stage	.75	.63	.75	.75	.63	.75
	First Stage for Constraint on Executive					
English legal origin	.19	.03	−.19	.19	.03	−.19
	(.55)	(.48)	(.51)	(.55)	(.48)	(.51)
Log settler mortality	−.47	−.52	−.59	−.47	−.52	−.59
	(.17)	(.21)	(.23)	(.17)	(.21)	(.23)
R^2 in first stage	.47	.24	.43	.47	.24	.43
Observations	51	51	39	51	51	39
Panel B	Dependent Variable: Private Credit as a Percentage of GDP			Dependent Variable: Stock Market Capitalization as a Percentage of GDP		
	Second Stage					
Legal formalism	−.02	.080	−.09	−.12	−.15	−.16
	(.25)	(.09)	(.11)	(.19)	(.09)	(.10)
Constraint on executive	.40	.33	.38	.28	.30	.25
	(.21)	(.15)	(.18)	(.16)	(.15)	(.15)
p-value for religion	[.44]			[.48]		
Latitude		−.85			−1.33	
		(.90)			(.86)	
p-value for macro variables			[.43]			[.82]
Observations	51	51	39	50	50	39

Note.—Standard errors are in parentheses. All regressions are cross-sectional, 2SLS, with one observation per country. The independent variables in cols. 1 and 4 in panel A and col. 1 in panel B are percentage of population that is Protestant, Muslim, and "other" (p-value is reported for their joint significance), with Catholic as the omitted base category; in cols. 2 and 5 in panel A and col. 2 in panel B, latitude; and in cols. 3 and 6 in panel A and col. 3 in panel B, the log of average annual inflation, 1970–97; government consumption as a percentage of GDP, 1970–89; and an index of real exchange rate overvaluation, 1960–97 (p-value is reported for their joint significance). The instruments are a dummy variable for whether a country has an English legal origin and log settler mortality. Control variables shown in the second stage are also included in the first stage but are not reported to save space. The first stage for the columns in panel B is essentially the same as for those in panel A. For more detailed data definitions and sources, see App. table A1.

omitted base category. Controlling for religion has no effect on the coefficient on property rights institutions. Legal formalism remains positive, small, and insignificant in column 1 of panel A and negative, small, and insignificant in column 4 of panel A and column 1 of panel B. The most notable change occurs in the results for stock market capitalization: in column 4 of panel B, 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.[18]

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 8 confirm findings we have reported in other work (Acemoglu et al. 2001, 2002): once we control for institutions, there is no significant effect for geography on income per capita. This table also shows that there is no significant effect of geography on investment and on measures of financial development. The pattern of results for property rights institutions and contracting institutions is essentially unchanged, except that legal formalism no longer appears to be a significant determinant of stock market capitalization (see col. 5 of panel B).

Macroeconomic variables are generally viewed as potential determinants of both investment and financial development. Countries with high inflation, for example, are often thought to have less developed financial systems. We find that the addition of these variables has little effect on the relationship between property rights and contracting institutions and the outcome variables of interest.[19]

F. Interpretation

Our empirical investigation reveals an interesting pattern: contracting institutions and legal rules have some effect on stock market capitali-

[18] Stulz and Williamson (2003) argue that religion should be coded differently, with a 1 for the most popular religion of a country and a 0 for all other religions, no matter how large. Using this alternative coding does not significantly affect our main results.

[19] Our working paper version (Acemoglu and Johnson 2003) also investigated whether the effect of property rights institutions on investment, credit, and stock market development is direct or indirect (i.e., working through their effects on GDP per capita). This question is difficult to answer because GDP per capita today is clearly endogenous (as shown by the results in table 4), and including it as a right-hand-side variable would lead to biased estimates. When we do this "biased" exercise, there is a high degree of collinearity, and log GDP per capita, property rights institutions, and contracting institutions are not individually significant. However, joint significance tests show that GDP per capita and property rights institutions are typically jointly significant, whereas GDP per capita and contracting institutions are not (see Acemoglu and Johnson 2003, table 10). These results therefore confirm the overall patterns shown above: property rights institutions but not contracting institutions have significant effects on investment and financial development.

zation (and thus on the form of finance, e.g., the use of equity vs. debt contracts). 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. On the other hand, 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, matter significantly for all these outcomes.

Although a full explanation for these results is not possible with our current level of knowledge, they are consistent with the ideas discussed in the Introduction: legal rules and procedures primarily affect the contractual relations between private individuals, in particular between debtors and lenders or upstream and downstream 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 by developing informal arrangements. One way of contracting around these rules is to change the form of financial intermediation, so in societies with 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 may be relatively limited.

When it comes to arrangements regulating property rights and the relationship between the state and individuals—that is, property rights and political 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 contracting institutions do.

At present, this interpretation is merely a conjecture, and more detailed work is necessary to investigate it in greater detail and also to determine the precise channels through which property rights institutions matter for economic outcomes.

VI. Inside the Black Box

The evidence so far establishes that a set of proxies we have associated with property rights institutions have a large effect on long-run economic growth, investment, financial development, and stock market development, whereas another set of proxies related to contracting institutions have a much more limited effect on all these outcomes (with the exception of stock market development). Do these proxies really correspond to property rights institutions and contracting institutions?

While a definitive answer to this question is difficult, in this section we use the World Bank's WBES, a firm-level survey covering 80 countries, to substantiate the relationship between these proxies and property rights and contracting institutions. The survey asked managers about their assessment of various legal, economic, and political impediments to their businesses. Data from this survey, in the form of country averages, were previously used by Djankov et al. (2003).

In panels A and B of table 9, we use three variables related to legal problems faced by firms. The first is firms' assessment of the general quality of the courts. We use responses to the following statement: "Please rate the quality and efficiency of services delivered by courts." The second variable is the firms' assessment of the specific functioning of the judiciary with regard to business disputes, from the following question: "In resolving business disputes, do you believe your country's court system to be: (*a*) fair and impartial, (*b*) honest/uncorrupt, (*c*) quick, (*d*) affordable, (*e*) consistent, (*f*) decisions enforced?" We use the average of firms' answers to all six questions. The third variable is firms' views on the violation of intellectual property by competitors, which pertains to the interaction between the respondent firm and other similar firms. In all cases, we normalize the indices so that higher scores correspond to greater problems for the respondents. We therefore expect better contracting institutions and English legal origin to be associated with lower values of these indices, whereas our measures of property rights institutions and our instruments for them should *not* be. The results in table 9 show exactly this pattern.

Panel A displays reduced-form regressions of the three variables on English legal origin and either log settler mortality or log population density in 1500. Panel B shows 2SLS regressions of these measures on constraint on executive and legal formalism as proxies for property rights and contracting institutions, respectively. In all regressions, the observations are at the firm level, and we include firm sales as a control (the results are very similar without this control) and cluster the standard errors for arbitrary correlation in the variance-covariance matrix within each country block.[20]

Panel A shows that there is a strong relationship between English legal origin and the general quality of courts, the functioning of the judiciary with regard to business disputes, and the violation of copyrights. Consistent with the emphasis in Djankov et al. (2003), countries with English legal origin seem to have fewer problems with courts and fewer contractual problems related to copyrights, patents, and trademarks between firms. In contrast, settler mortality and population den-

[20] We omit the first stages to save space. Despite the presence of firm-level sales as a control, these stages are very similar to the first stages reported in table 3.

TABLE 9

Determinants of Contracting and Property Rights Institutions: Sample of Ex-Colonies

	Dependent Variable: Quality of the Courts (1)	(2)	Dependent Variable: Judiciary Functioning for Business Disputes (3)	(4)	Dependent Variable: Violation of Copyrights, Patents, or Trademarks (5)	(6)
	Panel A. Reduced Form					
English legal origin	−.81	−.87	−.68	−.82	−.72	−.82
	(.21)	(.19)	(.18)	(.18)	(.12)	(.10)
Log settler mortality	.10		.18		.08	
	(.08)		(.08)		(.06)	
Log population density in 1500		−.02		.01		.05
		(.07)		(.07)		(.03)
R^2	.09	.09	.13	.12	.09	.11
	Panel B. Structural Form with Legal Formalism and Constraint on Executive, 2SLS					
Legal formalism	.44	.45	.39	.43	.38	.44
	(.11)	(.12)	(.13)	(.11)	(.06)	(.06)
Constraint on executive	−.07	.23	−.18	.11	−.04	−.07
	(.12)	(.28)	(.14)	(.23)	(.07)	(.14)
Includes firm-level sales?	yes	yes	yes	yes	yes	yes
Countries	38	44	38	44	38	44
Observations	3,043	3,379	3,282	3,637	3,029	3,347

	Dependent Variable: Frequency of Additional Payments (1)	(2)	Dependent Variable: Corruption of Government Officials (3)	(4)	Dependent Variable: Predictability of Legislation and Regulation (5)	(6)
	Panel C. Reduced Form					
English legal origin	.37	.04	−.25	−.49	.09	−.01
	(.31)	(.19)	(.20)	(.14)	(.14)	(.16)
Log settler mortality	.51		.32		.33	
	(.11)		(.07)		(.06)	
Log population density in 1500		.33		.21		.06
		(.04)		(.03)		(.04)
R^2	.08	.12	.10	.14	.06	.01
	Panel D. Structural Form with Legal Formalism and Constraint on Executive, 2SLS					
Legal formalism	−.04	.10	.24	.33	.05	.03
	(.28)	(.36)	(.16)	(.23)	(.14)	(.09)
Constraint on executive	−.72	−1.23	−.42	−.77	−.45	−.21
	(.28)	(.87)	(.18)	(.61)	(.16)	(.16)
Includes firm-level sales?	yes	yes	yes	yes	yes	yes
Countries	38	44	38	44	38	44
Observations	3,220	3,568	3,145	3,482	3,348	3,707

Note.—Standard errors, clustered by country, are in parentheses. All regressions are cross-sectional, 2SLS, using data only from ex-colonies. In panels B and D, the instruments in all columns are a dummy variable for whether a country has an English legal origin; in cols. 1, 3, and 5, log settler mortality; and in cols. 2, 4, and 6, log population density in 1500. Firm-level sales are included in all columns. For detailed sources and definitions, see App. table A1.

sity in 1500 have no effect on these variables (with the exception of col. 3).

The same pattern also emerges from the 2SLS regressions in panel B; the instruments are English legal origin in all columns, along with log settler mortality in odd-numbered columns and log population density in even-numbered columns. In all regressions, legal formalism is a significant determinant of the quality of the courts, the functioning of the judiciary with regard to business disputes, and the violation of copyrights, patent, or trademarks; in no specification does constraint on executive have a significant effect on these variables. We interpret this pattern as evidence that our measures of contracting institutions do indeed capture legal and contractual problems faced by firms, and these problems are largely unrelated to political relationships and to property rights institutions.

Panels C and D of table 9 investigate the relationship between property rights institutions (and our instruments for property rights institutions) and political problems faced by firms. In the WBES, there are three distinct variables that appear to be related to political problems and expropriation risks faced by firms.

The first is firms' answers to a question about how frequently they make "additional payments" of any kind to government officials. The second is their assessment of the problem posed by government corruption, and the third variable represents firms' views on the predictability of legislation and regulation. We normalize all these variables so that higher scores mean more corruption, less predictability, and worse property rights enforcement for firms. We expect property rights institutions and our instruments for them to be related to these indices, whereas contracting institutions and English legal origin should *not* predict differences in the indices. This is the general pattern we find.

Panel C shows that English legal origin has no effect on these variables except in column 4, whereas both log settler mortality and log population density in 1500 have large effects (the exception is col. 6 with population density, where the effect is quantitatively smaller than in cols. 2 and 4 and only marginally significant). Panel D shows the 2SLS results: constraint on executive is strongly related to corruption and predictability of the law and regulation (with stronger results when log settler mortality is used as the instrument), whereas legal formalism is not. We obtain similar results with the other two measures of property rights institutions (not reported to save space).

We interpret this evidence as supporting the notion that our measures of property rights institutions and the sources of variation we are exploiting are related to firms' problems with the government and thus likely to be related to the risk of expropriation by politically powerful elites and politicians.

VII. Conclusion

There is now considerable evidence that "institutions" are important determinants of 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., the procedural complexity necessary to collect on a nonpaying commercial debt, and the number of procedures necessary to collect on such a debt. For property rights institutions, we used various measures of constraints on government power and protection of property rights. Our identification strategy was to exploit differences in the historical experiences of former European colonies. In this sample, there are strong and distinct first-stage relationships between legal origin and various measures of contracting institutions 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 but have a more limited impact on growth, investment, and the total amount of credit in the economy.

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. 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 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 weak contracting institutions 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? By the government and politically powerful groups expropriating the incomes of other groups? Or by blocking entry by new groups and producers? We believe that these are fruitful areas for future research.

Appendix

TABLE A1
VARIABLE DEFINITIONS AND SOURCES

Variable	Description	Source
Legal formalism	Index of formality in legal procedures for collecting on a bounced check; ranges from 1 to 7	Material supplied privately by Simeon Djankov; update of Djankov et al. (2003)
Procedural complexity	Index of complexity in collecting a commercial debt, valued at 50% of annual GDP per capita; ranges from 0 to 10	World Bank (2004) (original data range from 0 to 100; here divided by 10)
Number of procedures	Number of procedures involved in collecting a commercial debt, valued at 50% of annual GDP per capita	World Bank (2004)
Constraint on executive, average over 1990s	A seven-category scale, from 1 to 7, with a higher score indicating more constraint: 1 indicates unlimited authority; 3, slight to moderate limitations; 5, substantial limitations; 7, executive parity or subordination; 2, 4, and 6, intermediate values (we calculated average values from 1900 to 2000, inclusive, treating interregnums as missing values)	Polity IV data set, downloaded from Inter-University Consortium for Political and Social Research; variable described in Gurr (1997)
Average protection against expropriation risk	Risk of expropriation of private foreign investment, from 0 to 10, with a higher score meaning less risk; we calculated the mean value for the scores in all years from 1985 to 1995; previously used in Acemoglu et al. (2001)	From Political Risk Services, September 1999; previously used by Knack and Keefer (1995); organized in electronic form by the IRIS Center (University of Maryland); original compilers are Political Risk Services
Private property	From 1 to 5, with a higher score indicating better protection for private property: 1 indicates very low; 2, low; 3, moderate; 4, high; and 5, very high	Gwartney and Lawson (1997), property rights measure; original data range from 1 (very high) to 5 (very low); here, multiply by −1 and add 6
Log GDP per capita in 1995 (PPP measure)	Logarithm of GDP per capita, on PPP basis, in 1995	World Bank (2003) (http://www.publications.worldbank.org/WDI) (February)

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, the year is ignored in calculating the average)	Penn World Tables, version 6.1 (2002): http://webhost.bridgew.edu/baten/
Credit to the private sector	As a percentage 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	World Bank (2003): http://www.publications.worldbank.org/WDI (February)
Stock market capitalization	Market value of all traded stocks as a percentage of GDP, average over 1990–95	Beck et al. (2001)
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 et al. (1999)
Latitude	Absolute value of the latitude of the country, scaled to take values between 0 and 1 (0 is the equator)	La Porta et al. (1999)
Log inflation	Log of average annual inflation in the consumer price index, 1970–98	World Bank World Development Indicators (1999; CD-ROM)
Government consumption	Average of the ratio of real government consumption expenditure to real GDP, 1970–89	Barro-Lee data set (described in Barro and Lee [1994])
Real exchange rate overvaluation	Index of real overvaluation of the official exchange rate in 1960–97	As used in Acemoglu et al. (2003); based on original work by David Dollar and update by Bill Easterly and Ross Levine
English legal origin (or common-law countries)	Coded 0 or 1: 1 indicates that country was colonized by Britain and English legal code was transferred	La Porta et al. (1999) and Djankov et al. (2003)
French legal origin (or civil-law countries)	Coded 0 or 1: 1 indicates that country was colonized by France, Spain, Belgium, Netherlands, Portugal, or Germany and French legal code was transferred	La Porta et al. (1999) and Djankov et al. (2003)

TABLE A1 (*Continued*)

Variable	Description	Source
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 et al. (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 et al. (2002), based on McEvedy and Jones (1978)
Quality of the courts	Firms' assessments of the quality of the courts; index ranging from 1 to 6 (higher score is a less favorable assessment)	WBES (2000)
Functioning of the judiciary with respect to business disputes	Firms' assessments of how the judiciary functions with regard to business disputes; index ranging from 1 to 6 (higher score is a less favorable assessment)	WBES (2000)
Violation of copyrights, patents, or trademarks	Firms' concern about the extent of violation of their copyrights, patents, or trademarks by competitors; index ranging from 1 to 4 (higher score indicates more of a problem)	WBES (2000)
Frequency of additional payments	Firms' report of whether they have to make additional payments for government services; index ranging from −6 to −1 (higher score indicates more frequent payments)	WBES (2000) (original variable multiplied by −1)
Corruption of government officials	Firms' assessment of the obstacle posed by government corruption; index ranging from 1 to 4 (higher score indicates more of a problem)	WBES (2000)
Predictability of legislation and regulation	Firms' concern about the unpredictability of laws and regulations; index ranging from 1 to 6 (higher score indicates more of a problem)	WBES (2000)

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