

Trust, regulation, and contracting institutions

Brandon N. Cline | Claudia R. Williamson

Department of Finance and Economics,
Mississippi State University, Starkville,
Mississippi, USA

Correspondence

Brandon N. Cline, Department of
Finance and Economics, Mississippi State
University, P.O. Box 9580, Starkville,
MS 39762, USA.
Email: brandon.cline@msstate.edu

Abstract

This paper demonstrates that trust directly influences contracting efficiency. We document that trust reduces demand for contract regulation and positively relates to a high-quality contracting environment, supporting a substitution hypothesis. Furthermore, contract regulation no longer leads to poor contracting outcomes. These findings suggest that lack of trust significantly explains inefficient contracting institutions. Based on interaction effects, we note that trust could complement formal enforcement in countries with weak regulation. As regulation increases, trust substitutes for contract regulation. Overall, trust positively promotes efficient contracting by reducing burdensome regulation and providing an alternative to formal contract enforcement.

KEYWORDS

contract enforcement, efficiency, trust, regulation

JEL CLASSIFICATION

F2; O17; K2

1 | INTRODUCTION

Contracting institutions monitor and enforce transactions between private parties, for example, between a debtor and creditor or a firm and its suppliers. Both sides of a contract might want to renege on an agreement, and they can do so if there are failures in enforcement. The literature

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documents many specific concerns resulting from costly contract enforcement. For example, Jappelli, Pagano, and Bianco (2005) and Bae and Goyal (2009) illustrate that contract regulation negatively affects access to credit. Consistent with these findings, other studies document that more efficient judicial contract enforcement improves overall business climate (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; Lu & Tao, 2009), increases firm size (Giacomelli & Menon, 2016), reduces the informal sector (Dabla-Norris, Gradstein, & Inchauste, 2008), fosters innovation (Cooley, Marimon, & Quadrini, 2004; Cumming & Knill, 2012), and promotes international trade (Nunn, 2007). Consequently, contract enforcement remains an important predictor of economic growth (Bjørnskov & Méon, 2013; Djankov, McLiesh, & Ramalho, 2006; North, 1990). Given the importance of understanding the determinants of contracting institutions, in this paper we focus on the nexus between formal regulation, informal norms, and the quality of the contracting environment.

To avoid potential opportunism and facilitate exchange, individuals could prefer a third-party contract enforcer, relying on enforcement from government courts. Formal contracting institutions are comprised of rules and regulations, established by the government, that provide a legal framework to enforce contracts. A well-functioning judiciary requires courts that are accessible to the public, predictable, and that resolve cases in a reasonable time (World Bank, 2016a). Accordingly, high-quality formal contract enforcement can result from a low-regulated, efficient court system.

Governments, however, range in ability and willingness to provide the necessary legal framework to enforce contracts, and the rules adopted for settling disputes vary greatly across countries. In a seminal paper, Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) illustrate that greater legal complexity to enforce a contract not only increases the costs of enforcement, but also results in less court consistency, less honesty and fairness in judicial decisions, and more corruption (see also Djankov et al., 2006). Consequently, more stringent contract regulations are associated with worse financial outcomes.

Even in countries with higher-quality formal contracting institutions, it is impossible to create formal rules that sustain all complex financial exchanges—similar to the difficulty of writing complete contracts (Algan & Cahuc, 2013). Informal institutions—and, in particular, generalized trust—can fill these missing gaps, contributing to more efficient contracting (Dixit, 2004; Knack & Keefer, 1997). Fukuyama (1995) describes trust as a set of reciprocal moral habits and obligations that are internalized, thereby reducing expectations of being cheated. When individuals do not expect to be cheated, they do not desire costly government oversight and are simultaneously incentivized to engage in exchanges that would otherwise not take place.

We therefore focus on the role that generalized trust plays in facilitating contract-intensive financial exchanges. We hypothesize that trust affects contracting through two channels: first, trust decreases demand for regulation over the courts that formally enforce a contract; and second, trust directly influences contracting efficiency by substituting for costly formal regulation.

To understand how trust, formal contract enforcement, and efficient contracting institutions are linked, we first conceptualize how generalized trust generates preferences for less control over the government courts where contracts are enforced. Based on the prior works of Aghion, Algan, Cahuc, and Shleifer (2010) and Pinotti (2012), who document a negative association between new business entry regulation and trust, we hypothesize that, when a society embodies more trust, there will be less demand for regulation over the courts to enforce a contract.

Given this inverse association, our second main contention is that trust and formal contract enforcement can directly influence contracting outcomes by acting as substitutes. Trust not only influences the amount of contract regulation but can also promote market exchange by acting as a substitute when formal contract enforcement is too costly.

A variation of this hypothesis is that, depending on the level of contract regulation in a country, trust can be both a substitute for and a complement to contract regulation. Carlin, Dorobantu, and Viswanathan (2009) show that regulation and trust act as complements if formal rules enable trust. Thus, at low levels of regulation, trust complements formal rules, further enabling complex transactions. However, when formal contract enforcement is excessively costly, trust substitutes for formal contract regulation.

In addition, we hypothesize that, once trust is considered, the negative effects of contract regulation documented in the literature are mitigated or disappear. Based on our first hypothesis, that distrust is driving the demand for more government regulation over the courts, the level of trust can also explain “bad” economic outcomes previously attributed to contract regulation. If so, lack of trust rather than regulation explains contracting inefficiency.

Trust enters our framework in two ways. First, it influences the demand for regulation of the courts. Second, it promotes efficient contracting by substituting for formal regulation. If trust substitutes for regulation, we expect a negative association between trust and contract regulation but a positive direct link between trust and contracting outcomes. To test each claim, we distinguish contract regulation from contracting outcomes, which capture efficient contract enforcement.

To maximize sample size, we create an unbalanced panel from 2000 to 2015 for up to 86 countries. To proxy for formal contract enforcement, we collect country-level contract enforcement regulation data from the World Bank (2016a) project. This includes the number of procedures and the number of days to enforce a contract through a local court. We create an overall contract regulation index by extracting common variations in time and among procedures to enforce. A higher score reflects greater court regulation to enforce a commercial contract and, thus, lower-quality formal contract enforcement. We also collect data measuring the level of trust within a country from the World Values Survey (WVS). The most common proxy of trust, generalized trust, is measured by the percentage of respondents who answered “yes” to the question, “Do you think most people can be trusted?”

Our analysis reveals that societies with more generalized trust adopt fewer regulations to enforce commercial contracts, including fewer procedural steps and less time. For example, a one standard deviation increase in trust, the difference between New Zealand and Belarus, lowers the contract regulation index by 0.27 standard deviations, the difference between the United States and China.

Next, we test the substitution hypothesis by examining the direct link between trust and contracting outcomes while controlling for the level of contract regulation. Due to inability to directly observe contract formation and enforcement, we rely on several measures of *de facto* contracting outcomes of efficient contracting that could result from informal or formal enforcement: the size of the shadow economy, the rule of law, auditing quality, the ease of venture capital acquisition, and research and development (R&D) expenditures.

We find that trust significantly relates to all five contracting outcomes. As expected, stricter contract regulation deters efficient contracting when trust is excluded. However, the simultaneous inclusion of trust and contract regulation shows that the coefficients on contract regulation are attenuated. This result suggests that prior interpretation of the effects of contract regulation could be confounded when the variation in trust across countries is not considered.

This conclusion is robust to controlling for endogeneity using instrumental variable (IV) estimation. We instrument for trust with genetic distance and pronoun drop, two exogenous variables commonly used in the literature to proxy for trust (Bjørnskov, 2012; Cline & Williamson, 2016; Guiso, Sapienza, & Zingales, 2009; Tabellini, 2008). The results suggest that endogeneity and attenuation biases can cause ordinary least squares (OLS) estimates to *understate* the role of trust in influencing contracting outcomes, since the coefficients from the IV estimation are larger than those in OLS models. For example, marginal effects imply that a one standard deviation increase in trust decreases the shadow economy by approximately one-half of a standard deviation.

To further explore the association between trust, regulation, and contracting efficiency, we introduce an interaction term between trust and contract regulation. We find that trust retains an independent and significant association with contracting outcomes, directly affecting contracting efficiency. Based on marginal effects from the interaction term estimations and results using subsamples, we consistently find that trust significantly influences contracting outcomes in less regulated countries. This provides support for the idea that trust can complement less regulated courts to further enhance the quality of the contracting environment. As regulation increases from low level to the mean level, the importance of trust increases, suggesting that trust substitutes for more costly regulation. In most specifications, the effect of trust increases with the regulation burden.

As countries become highly regulated, however, the significance of trust is less consistent. We do find substitution for our two general measures of contracting institutions, size of the shadow economy and the rule of law. For both measures, trust becomes increasingly important, substituting for high levels of regulation. However, for contracting measures relying more on explicit contracting (auditing quality, venture capital, and R&D), we find that trust is less important when the courts are heavily regulated. This indicates that relying on trust to enforce contracts becomes more difficult as the courts become highly regulated.

We also document that contract regulation does not significantly influence contract efficiency in either low- or high-trust countries. Regulation has virtually no impact on contracting efficiency once we condition its effect on trust, supporting the novel finding of Pinotti (2012). The interaction effects and subsamples are robust to endogeneity, since we continue to instrument for trust and its interaction with contract regulation.

Our work provides further evidence supporting the literature on the relation between trust, regulation, and efficiency (Aghion et al., 2010; Pinotti, 2012). Countering Acemoglu and Johnson (2005, p. 955), who state that “[t]he most important component of contracting institutions is the functioning of the legal system,” we find that trust is the most important component of efficient contracting institutions. Trust explains not only the level of regulation over the judicial system, but also the difference in contracting efficiency across countries. Once trust is included in specifications with regulation, contract regulation no longer leads to worse contracting outcomes. This result suggests that regulation is not the root cause of contracting inefficiency, as suggested by Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002), but that lack of trust explains inefficient contracting. Trust directly promotes contracting efficiency, which indicates that trust is a complement to contracting itself and not a substitute, as generally argued by the literature on incomplete contracting.

Thus, in suggesting that trust promotes the contracting environment, our paper challenges the claim that contracting and trust are substitutes, particularly when market failures lead to incomplete contracting. In other words, our findings counter prior literature demonstrating that contracting and trust are substitutes due to the inability to write and enforce complete

contracts. As summarized by Carlin et al. (2009), trust is only important in contracting if contracts cannot be written completely and perfectly enforced. If contracts can include necessary contingencies and are upheld by the courts, then trust is unnecessary for contracting efficiency. Williamson (1993) similarly argues that the ability to write complete contracts renders trust unimportant for contracting. If, however, contracts are incomplete and cannot perfectly rely on formal contracting institutions, then trust can provide an additional mechanism to promote contract efficiency.

Our findings support this claim, but we also find that trust is important, regardless of the level of efficiency of formal enforcement. The literature on incomplete contracting suggests that trust is only important if contracts cannot be perfectly written and formally enforced; however, we view our work as suggesting that trust complements contracting, in both low- and highly regulated countries. Therefore, we contribute to the small but growing literature showing that contracting and trust are complements. For example, McCannon, Asaad, and Wilson (2018) find that, when both formal contract enforcement and trust are high, individuals participate more in contract formation with larger investments. Similarly, Alesina and Giuliano (2015) demonstrate a two-way causal effect between culture, such as trust, and formal institutions, and Carlin et al. (2009) model theoretically how trust and regulation coevolve.

In addition, we contribute to the recent works linking trust and finance (Ahern, Daminelli, & Fracassi, 2015; Guiso & Jappelli, 2005; Guiso, Sapienza, & Zingales, 2004; Guiso, Sapienza, & Zingales, 2008; Guiso et al., 2009). More broadly, our work relates to the culture and finance literature. Bryan, Nash, and Patel (2015) find that culture is a significant determinant of compensation contracts. Supporting this view, other studies find that culture is linked to attitudes toward risk, firm risk taking (Cen & Doukas, 2017; Li, Griffin, Yue, & Zhao, 2013; Shao, Kwok, & Zhang, 2013; Ucar, 2019), and investment efficiency (Chen, Jin, Ma, & Xu, 2018). For example, Doukas and Zhang (2016) demonstrate that top managerial executive envy, a psychological trait, increases merger waves motivated by so-called envy-pay. Altanlar, Guo, and Holmes (2018) find that culture affects cognitive dissonance, which can explain cross-country anomalies such as momentum and post-earnings-announcement drift.¹

Lastly, we contribute to a subset of studies illustrating that culture influences the adoption of regulation (Licht, Goldschmidt, & Schwartz, 2005; Stulz & Williamson, 2003). Cline and Williamson (2016) document that trust affects shareholder protection regulation and efficient financial development. Both Aghion et al. (2010) and Pinotti (2012) show a negative association between trust and the regulation of the domestic entry of new firms. Our work is consistent with their findings.

2 | TRUST, REGULATION, AND CONTRACTING OUTCOMES

2.1 | Generalized trust and finance

According to Gambetta (2000), trust is the subjective probability that one person believes another will behave in a specific way. Trust, therefore, can be thought of as the propensity for

¹Individualism is associated with greater stock crash risk (Dang, Faff, Luong, & Nguyen, 2018), and it affects dividend policy (Shao, Kwok, & Guedhami, 2010), firm growth (Bouabakri & Saffar, 2016), capital structure (Chui, Lloyd, & Kwok, 2002), and momentum profits (Chui, Titman, & Wei, 2010). Cline and Williamson (2017) find that individualism is significantly related to efficient contract enforcement.

individuals to cooperate. More specifically, Guiso et al. (2008) view trust as the subjective probability an individual attributes to the likelihood of being cheated.

Trust exists in two distinct forms: trust in strangers and trust in people known personally. The distinction centers on the difference between generalized and limited morality. Banfield (1958) conveys that societies with limited morality promote codes of good conduct within familial or personal networks; however, they morally accept selfish behavior outside those networks. Alternatively, generalized morality represents societies that encourage moral and ethical behavior both inside and outside personal networks. Societies with generalized morality tend not to act opportunistically or cheat strangers, which leads to attitudes of reciprocal cooperation, confidence in strangers, and trust outside local networks. Consequently, generalized morality is linked to generalized trust, and limited morality is associated only with trust within family or other personal networks (Tabellini, 2008).

In this context, generalized trust arises when an individual places resources at the disposal of another party with no legal commitment but an expectation that this act of trust will have a beneficial economic payoff (Coleman, 1990). Dixit (2004) theorizes that generalized trust facilitates anonymous market exchange. Algan and Cahuc (2013) echo this viewpoint by broadly defining trust as cooperative attitudes outside the family, stressing that most research illustrating the economic consequences of trust explores generalized trust, and not personal trust. This research strongly links greater levels of generalized trust to financial development (Aghion et al., 2010; Bjørnskov & Méon, 2013; Bjørnskov & Méon, 2015; Knack & Keefer, 1997; Ng, Ibrahim, & Mirakhor, 2016; Peiró-Palomino & Tortosa-Ausina, 2013; Tabellini, 2010; Zak & Knack, 2001).²

For example, Guiso et al. (2004) show that trust is strongly related to the ways people participate and invest in financial markets. Guiso et al. (2008) find that stock market participation is higher in countries with greater levels of trust. Ahern et al. (2015) empirically show that differences in trust levels between countries can explain cross-country mergers announcement returns. Similarly, Guiso et al. (2009) find that bilateral trust between countries increases trade in goods, financial assets, and direct investment. Guiso and Jappelli (2005) argue that trust results in diversified portfolios for investors who trust in financial intermediaries, since they are more willing to delegate decisions to these intermediaries.

2.2 | Trust and the regulation hypothesis

In trusting societies, individuals might not demand formal regulation to prevent others from renegeing on contracts. However, individuals in low-trust societies expect others to behave opportunistically. They view government regulation as necessary to promote cooperation and exchange via contracting. Consequently, distrust fuels support for the governmental enforcement of contracts.

In a seminal paper, Aghion et al. (2010) model trust and regulation. The authors illustrate two outcomes: one in which a society is trusting and trustworthy, with no regulation but good economic outcomes, and another with low trust and low trustworthiness, but heavy regulation

²Trust is also central to corporate governance (Bloom, Sadun, & Van Reenen, 2012; Cingano & Pinotti, 2016; Ferris, Javakhadze, & Rajkovic, 2017; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997). In addition, trust is beneficial for firms, since large corporations rely on cooperation between strangers (Fukuyama, 1995). La Porta et al. (1997) empirically document that trust increases large firms' share of the economy. Supporting this result, Cingano and Pinotti (2016) find that trust is associated with greater decentralization and larger firms.

and poor economic outcomes. In this model, individuals living in a trusting community do not expect opportunistic behavior, nor do they desire a high degree of social control via government regulation. Therefore, these individuals further invest in trust and experience a less regulated environment, higher investment, and more entrepreneurship. In contrast, low-trust societies expect high levels of corruption and do not invest in trust. The lack of trust leads to a heavy regulatory burden, little investment, and less entrepreneurship. Thus, greater distrust creates demand for public regulation, which, in turn, results in worse economic and financial outcomes. Aghion et al. emphasize that concern over opportunistic behavior in market exchange increases the demand for government intervention, and the causation runs from trust to regulation.

When public fear is sufficiently high, demand for regulation can arise even if the regulation is anticipated to hinder positive market activity. Individuals in this scenario are more concerned about being cheated than the potential costs of intervention (Acemoglu & Verdier, 2000). Thus, the marginal benefit from additional regulation to reduce potential exploitation by private citizens exceeds the marginal cost of intervention, including reduced market activity. For example, Hochberg, Sapienza, and Vissing-Jorgensen (2009) and Zingales (2009) both suggest that, as US trust declined after the financial crisis, the public increased pressure to tighten financial regulation. This distrust contributed to the passage of costly legislation, such as the Sarbanes–Oxley Act of 2002 and the Dodd–Frank Act of 2010.

Our first prediction is that generalized trust decreases the demand for contract regulation. We therefore hypothesize that the influence of generalized trust on contract regulation results from the expected probability of being cheated in private dealings. In trusting societies, individuals might not demand formal regulation to prevent others from reneging on contracts, because they do not fear expropriation. However, individuals in low-trust societies expect others to behave opportunistically. This distrust creates public demand for government regulation over the judicial system. In our framework, more generalized trust decreases the demand for contract regulation.³

2.3 | Trust, regulation, and contract efficiency

Next, having found a negative association between trust and regulation, we further hypothesize that trust is a substitute for formal contract enforcement. If so, we should find a direct, positive link to contract efficiency. In the presence of costly formal rules, trust is critical for facilitating financial exchange. In trusting societies, individuals do not expect to be cheated, since they believe that others have internalized moral rules deterring opportunistic behavior. In these societies, trust can substitute for formal regulation, directly providing incentives for contract formation and contract enforcement.

A large body of work suggests that, when formal institutions are weak, trust becomes more important for economic exchange. Knack and Keefer (1997) and Ahlerup, Olsson, and Yanagizawa (2009) indicate that trust could be more important for economic growth in poorer countries where formal institutions are weak. Similarly, Guiso et al. (2004) find that, compared to the less trusting southern regions of Italy, households in the northern regions rely on trust to

³Alternatively, trust can fill the missing contracting gaps, lowering transactions, and monitoring costs due to the inability to write complete contracts (Algan & Cahuc, 2013). If so, trust complements formal contract regulation, which should result in a positive association between the two variables. However, given the well-documented negative association between trust and regulation, we do not formally hypothesize that trust and regulation are complements.

help enforce financial contracts when the legal system cannot guarantee them. Thus, the formal regulatory regime designed to enforce contracts could be incomplete. Trust can fill this gap by reducing transactions costs, thereby enabling anonymous complex financial exchange (Algan & Cahuc, 2013; Bjørnskov, 2007, 2010; Dixit, 2004; Fukuyama, 1995; Guiso et al., 2008; La Porta et al., 1997; Zak & Knack, 2001).

Even in the absence of formal regulation, Mayer (2008) documents that equity markets developed in the early twentieth century by relying on trust relationships. Consistent with this conjecture, Acemoglu and Johnson (2005) suggest that, in the absence of effective enforcement by the state, individuals utilize private recourses to enforce contracts. Trust can still play a large role in enforcing contracts “even in states that make best efforts to provide protection for property rights and contract enforcement, [as] the state's access to information and the state's protection and enforcement mechanisms are inherently limited” (Williamson, 2015, p. 14). Therefore, trust can serve as a substitute for contract enforcement when governments create burdensome regulatory environments (Carlin et al., 2009; Knack & Keefer, 1997). In the presence of trust, individuals find it easier to rely on the nongovernmental enforcement of contracts.

For this same reason, we expect trust to directly promote contract efficiency if an individual believes that most people, including strangers, will not behave opportunistically. This generalized trust can therefore directly increase the quality of the contracting environment by encouraging contract formation and acting as an informal guarantee for contract enforcement.⁴

To disentangle the substitution effect, we examine not only the association between trust and regulation but also those between trust, regulation, and contracting outcomes. If trust is substituting for formal regulation, trust should directly promote contracting outcomes. Thus, trust should significantly decrease regulation while simultaneously increasing contract efficiency. This argument is supported by Pinotti (2012). Pinotti extends the work of Aghion et al. (2010) by demonstrating that distrust predicts regulation and that it is a cause of economic inefficiency. Trust, rather than regulation, explains previous findings of a negative impact of regulation on economic efficiency. Specifically, new firm entry regulation is a consequence of distrust and market failures. Applying this logic to contracting, we hypothesize that trust complements contracting institutions, and the effect of contract regulation should be subsumed by trust.

One final variation of our hypothesis is that, depending on the level of contract regulation in a country, trust could be both a substitute for and a complement to contract regulation. Carlin et al. (2009) show that regulation and trust act as complements if the introduction of formal rules facilitates the development of trust. Thus, when a legal system is well functioning and not costly to involve in a dispute, trust complements formal rules, further enabling complex transactions. However, when enforcement costs are high, formal regulation and trust can substitute for each other.

Collectively, our hypotheses suggest that, in the absence of generalized trust, societies adopt more contract regulations and experience worse overall contracting outcomes. In our framework, trust not only limits the amount of contract regulation, but also promotes efficient contracting. To test each claim, we separate contracting into the *de jure* rules pertaining to contract enforcement and the *de facto* outcomes of a well-functioning legal system.

⁴Alternatively, based on the inverse association documented between trust and regulation, it is plausible that formal contract regulation is substituting for lack of trust. Individuals in low-trust societies expect others to behave opportunistically. They therefore demand government regulation to promote cooperation and exchange (Aghion et al., 2010). In this scenario, formal contract regulation substitutes for a lack of trust.

3 | DATA

We create an unbalanced panel from 2000 to 2015 for up to 86 countries. Since data are not available for all countries across every year, four time periods are created by averaging the data over every 4 years.⁵ For example, the first time period is averaged from 2000 to 2003, thereby utilizing contract regulation data since 2003, the first year the data were available.

To test the associations between trust, regulation, and contracting institutions, a measure of generalized trust is collected and aggregated at the country level using survey data from the WVS (Inglehart et al., 2014). Many studies discuss the validity of using the WVS, stating that trust questions are appropriate proxies for honesty and perceptions of trustworthiness (Bjørnskov, 2007; Knack, 2001; Sapienza, Toldra-Simats, & Zingales, 2013; Uslaner, 2000, 2002). Generalized trust is measured by the percentage of respondents who answered “yes” to the question, “Do you think most people can be trusted?” To maximize our sample size, we use the last three waves from 1999–2004, 2005–2009, and 2010–2014, consisting of over 222,000 individual responses.⁶ We do not collapse the data around each WVS wave. Instead, we use the year in which a country was surveyed and average over our four time periods.

To measure contract enforcement regulation, we collect data from the World Bank (2016a) from 2003 through 2015. This project captures the rules to enforce a commercial contract by tracking the time and number of procedures involved in settling a private lawsuit. The data are compiled from an examination of the codes of civil procedure and other court regulations, as well as a survey of local litigation lawyers. We record in calendar days the amount of time it takes to enforce a contract from the moment the plaintiff files until payment is received. The number of procedures is the number of interactions necessary to settle a commercial dispute in the local courts, including all interactions, such as the steps to file, to go to trial, and to enforce the judgment, as both required by law and commonly used in practice. This also includes interactions between private parties or between the parties and a court officer.

The number of procedures directly measures the rules and regulations surrounding contract enforcement, whereas the time to enforce represents the indirect opportunity costs associated with compliance with such procedures. Thus, both variables should be considered jointly to accurately reflect contract regulation. This intuition is supported by results from principal component analysis, which indicates the existence of a single eigenvector whose eigenvalue is greater than 1. Therefore, we create an overall contract regulation index, extracting common variations in enforcement time and procedures. A higher score reflects greater court regulation to enforce a commercial contract, and thus less efficient contract enforcement. This index is our primary measure of contract regulation.

Figure 1 offers preliminary support for the hypothesis that generalized trust negatively predicts contract enforcement regulation. The association suggests that higher levels of trust lead to fewer contracting procedures and less overall time to enforce a contract, supporting the general conclusion of Aghion et al. (2010) and Pinotti (2012), that trust decreases levels of regulation.

Next, we introduce measures of contracting efficiency captured by *de facto* contracting outcomes. Due to the inability to directly observe contract formation and enforcement, we rely

⁵The four time periods are 2000–2003, 2004–2007, 2008–2011, and 2012–2015.

⁶The fourth wave spans from 1999 to 2004, surveying 41 countries and over 60,000 individuals. The fifth wave spans from 2005 to 2009 and surveys 54 countries and over 77,000 individuals. The sixth wave spans from 2010 to 2014 and surveys 85,000 individuals from 57 countries. Samples are drawn from the entire population aged 18 years and older, with a minimum sample size of 1000. Stratified random sampling is used to obtain representative national samples. The respondents were interviewed in person by professional organizations using uniformly structured questionnaires.

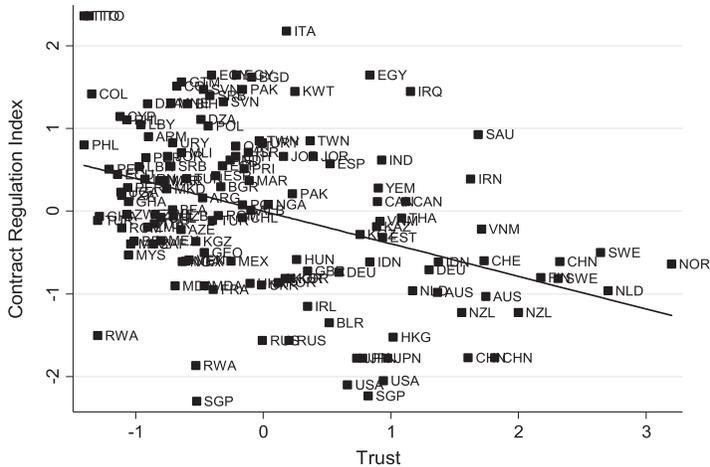


FIGURE 1 Contract regulation and trust across countries. The variable *Contract regulation index* is the first principal component of the number of procedures and the number of days required to enforce a commercial contract. The variable *Trust* is the percentage of respondents answering that most people can be trusted. Both indexes are standardized with a mean of 0 and a standard deviation of 1. The terms *Trust* and *Contract regulation index* have a negative and significant correlation of 0.40

on established proxies for the *de facto* outcomes of efficient contracting that could result from informal or formal enforcement. Our two general measures of efficient contracting are the size of the shadow economy and the rule of law.

The first general measure is the size of the unofficial economy, measured as a percentage of the gross domestic product (GDP) (Hassan & Schneider, 2016). The size of the shadow economy indicates the inability to function successfully in the formal economy, largely due to extensive regulatory and tax burdens (Schneider & Enste, 2013). A larger shadow economy therefore suggests greater reliance on informal contracting and informal contract enforcement. Countries that have smaller shadow economies and operate businesses in the formal economy more than likely utilize official means of contract enforcement. Following Djankov et al. (2002, 2003) and public choice theory, we expect contract regulation to increase the size of the shadow economy, since firms are incentivized to operate in the unofficial economy to avoid burdensome regulation. Figure 2a provides support for this argument, where the contract regulation index significantly increases the size of the shadow economy.

However, individuals could demand such costly regulation due to concerns over market failures. If so, the association between regulation and the shadow economy is biased. Controlling for trust to account for this relation, Figure 2b illustrates that contract regulation is now nonsignificantly associated with the shadow economy. This indicates that prior estimation incorrectly attributed a regulatory burden as the cause of unofficial market activity when trust levels explain both the demand for contract regulation and contracting outcomes.

Figure 2c provides further support where the partial correlation of trust with the size of the shadow economy is negative and significant.⁷ This result suggests that more trusting individuals are more likely to enter into official contracts, and those contracts are more likely to be

⁷Figure 2b,c shows the partial correlations from the specification in Table 3, Panel B.

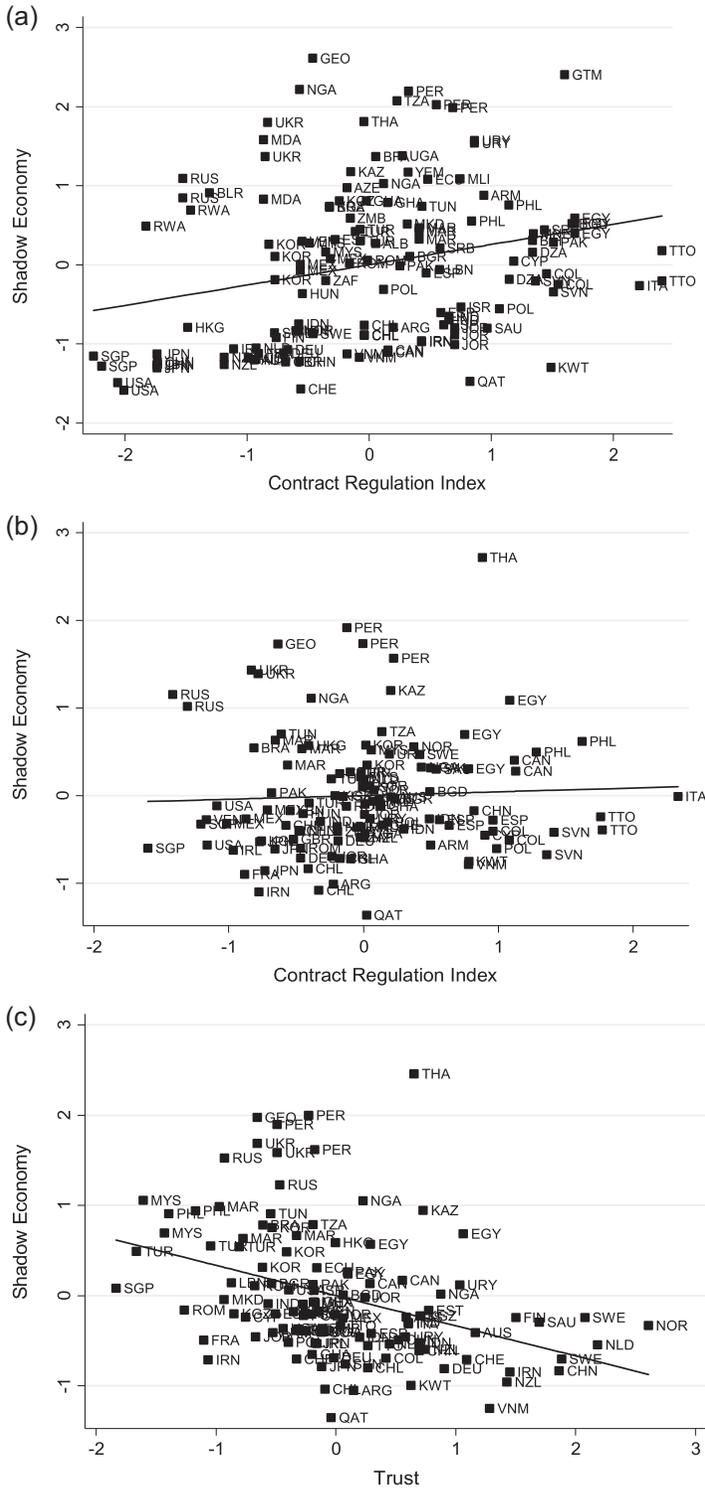


FIGURE 2 Continued.

enforced, incentivizing individuals to operate legally. Collectively, Figure 2 provides support for our claim that trust directly promotes efficient contracting, regardless of the level of contract regulation. The impact of contract regulation on efficient contracting is insignificant once trust is taken into consideration.

Our second general measure of contracting outcomes is the rule of law. We collect a measure of the rule of law from the Worldwide Governance Indicators (Kaufmann, Kraay, & Mastruzzi, 2015). This variable captures the perception and confidence that people will abide by the rules of society; in particular, it quantifies the quality of contract enforcement, including the enforceability of contracts, confidence in the judicial system, and the risk that a contract will not be enforced because of inefficiency, corruption, bias, or partiality within the judicial system. The data collected cover from 2000 to 2014. An increase in contracting court regulation is anticipated to decrease the rule of law, and we expect trust to increase the rule of law.

Three additional measures of contract enforcement outcomes were collected from the World Economic Forum's Global Competitiveness Index from 2006 through 2014 (Schwab & Sala-i-Martin, 2015). The data are aggregates of firm-level survey questions pertaining to activities that rely on explicit contracting. The first variable measures auditing quality and reporting standards by averaging responses to the question, "In your country, how strong are financial auditing and reporting standards? (1 = extremely weak; 7 = extremely strong)." As stated by Knack and Xu (2015), auditing standards are adopted primarily to facilitate transactions between private citizens and thus represent an important component of contracting institutions.

We also examine the ease of venture capital acquisition, measured with the question, "In your country, how easy is it for entrepreneurs with innovative but risky projects to find venture capital? (1 = extremely difficult; 7 = extremely easy)." The logic is that investor willingness to undertake riskier projects indicates secure property rights and confidence that future payments will be honored. Similarly, we examine a firm's willingness to spend on R&D. In high-risk environments, firms will be less likely to engage in R&D, given the uncertainty that contracts will be upheld. R&D expenditure is measured on a scale of 1 (do not spend) to 7 (spend heavily) in response to the question, "In your country, to what extent do companies spend on R&D?"

If trust directly promotes efficient contracting, it should increase auditing quality, access to venture capital, and R&D expenditure. Countries with more contract regulation could have worse auditing quality and less access to venture capital and spend less on R&D, but any negative association between regulation and contracting outcomes can be attenuated once trust is included.

Table 1 reports summary statistics for our primary variables of interest. Appendix A details the data sources and descriptions for all the variables. Appendix B lists the countries included in the analysis. We list the number of observations as well as the number of countries for each



FIGURE 2 The shadow economy, contract regulation, and trust across countries. The variable *Contract regulation index* is the first principal component of the number of procedures and number of days required to enforce a commercial contract. The term *Shadow economy* is the size of the unofficial economy, as a percentage of GDP, and *Trust* is the percentage of respondents answering that most people can be trusted. All three variables are standardized with a mean of 0 and a standard deviation of 1. (a) The Shadow Economy and Contract Regulation. The variable *Contract regulation index* has a significant correlation of 0.27 with *Shadow economy*. (b) The Shadow Economy and Contract Regulation, Controlling for Trust. This plot shows partial correlation based on the specification in Table 3, Panel B. The variables *Contract regulation index* and *Shadow economy* have a nonsignificant correlation. (c) The Shadow Economy and Trust. This plot shows partial correlation based on the specification in Table 3, Panel B. The variables *Contract regulation index* and *Trust* are significantly correlated, with a standardized coefficient of -0.34

TABLE 1 Summary statistics

This table reports the variable *Contract regulation index* is the first principal component of the number of procedures and the number of days to the enforcement of a commercial contract; *Procedures* is the number of procedural steps to enforce a commercial contract through the relevant court; *Time* is the number of calendar days from the filing of a lawsuit until payment; *Trust* is the percentage of respondents answering that most people can be trusted; *English legal origin* is an indicator equal to 1 if the country was colonized by Britain and English legal code was transferred; *ln Market cap* is the share price times the number of shares outstanding for listed domestic companies, in logarithmic form; *Shadow economy* measures the size of the unofficial economy, as a percentage of GDP; *Rule of law* measures the extent to which agents have confidence in and abide by the rules of society; *Auditing quality* is the average firm response to a question regarding the strength of financial auditing and reporting standards; *Venture capital* is the average firm response regarding a question about the ease with which entrepreneurs can secure venture capital for risky projects; *R&D expenditure* is the average firm response to a question regarding the extent to which companies spend on R&D; *Pronoun drop* is a dummy variable equal to 1 if the country's grammatical rules allow for pronoun drop; and *Genetic distance* is a country's genetic distance from Norway, based on similar unexpressed genetic material.

Variable	No. of observations/countries	Mean	Std. Dev.	Min.	Max.
<i>Contract regulation</i>					
Regulation index	138/86	0.00	1.00	-2.30	2.60
Procedures	138/86	34.44	6.73	19	51
Time (days)	138/86	568.28	300.87	120	1,459
ln Procedures	138/86	3.52	0.21	2.94	3.93
ln Time	138/86	6.22	0.49	4.79	7.29
<i>Main controls</i>					
Trust	138/86	0.00	1.00	-1.40	3.20
English legal origin	138/86	0.27	0.45	0.00	1.00
ln Market cap (% GDP)	117/70	0.00	1.00	-3.36	2.02
<i>Contracting outcomes</i>					
Shadow economy	116/69	0.00	1.00	-1.56	2.61
Rule of law	117/70	0.00	1.00	-1.66	1.81
Auditing quality	86/60	0.00	1.00	-1.54	1.77
Venture capital	86/60	0.00	1.00	-1.74	2.50
R&D expenditure	86/60	0.00	1.00	-1.55	2.33
<i>Instruments</i>					
Pronoun drop	105/59	0.70	0.46	0.00	1.00
Genetic distance	105/59	0.00	1.00	-1.09	1.75

variable, since our panel is unbalanced. For example, 86 countries are in the intersection of contract regulation and trust data but, since some countries enter more than once, 138 total observations are collected over the various periods.

The countries with the lowest contract enforcement regulation according to our index include Singapore and the United States. Those with the most procedures and the longest times to enforcement include Egypt, Italy, and Trinidad and Tobago. The Philippines and Trinidad and Tobago both record the lowest levels of generalized trust, with only 3.2% of individuals answering that most people can be trusted. At the other extreme, 73.7% of respondents in Norway believe most people can be trusted. The Netherlands, Sweden, and China also record

high levels of generalized trust. The contract regulation index and trust are normalized with a mean of 0 and standard deviation of 1.

We also normalize all five contracting outcome variables. Georgia and Guatemala have the largest shadow economies. The United States and Switzerland have the smallest unofficial economies. Zimbabwe scores the lowest in terms of the rule of law, whereas Sweden ranks the highest. Great Britain has the highest-quality auditing standards, and Kazakhstan has the lowest. Zimbabwe ranks the lowest in venture capital availability, and the United States the highest. Lastly, spending on R&D also varies, from Zimbabwe, with the lowest amount, to Switzerland, with the highest.

4 | EMPIRICAL MODEL AND RESULTS

We begin by examining our first hypothesis, that trust and regulation are substitutes, with an inverse association between trust and regulation. Next, we turn to the main analysis examining the associations between trust, regulation, and contracting outcomes.

Since the panel is unbalanced, we implement pooled OLS.^{8,9} We re-examine all analyses using annual data rather than averaging across every 4 years. The results remain qualitatively unchanged; however, the sample size is reduced by about 20%. Given the significant reduction in sample size, we employ the averaging methodology in most specifications.¹⁰ All model specifications control for English legal origin, regional, and period fixed effects. We do not include country fixed effects since Algan and Cahuc (2013) show that cross-country variation determines the association between trust and outcomes.

The literature on legal origins finds that common law nations have fewer hierarchical regulations relative to civil law nations (for a survey, see La Porta, Lopez-de-Silanes, Pop-Eleches, & Shleifer, 2008). As Djankov et al. (2003) and La Porta et al. (2008) show, the laws on the books, including contract regulation, are heavily influenced by a country's legal origin. The empirical model specifications control for common law, using an indicator variable equal to 1 for a country with an English legal origin, and 0 otherwise.¹¹ The inclusion of an English legal origin controls for a country's propensity for formal regulation.

In addition to legal origin, we control for regional and period fixed effects in the baseline specification. To account for other effects that could impact contract regulation, a number of variables are included in separate specifications. These control for different types of trust, political institutions, economic factors, and cultural effects.

4.1 | Trust and contract regulation

Table 2 reports the investigation into the impact of trust on contract regulation. The dependent variables in models (1)–(3) are the logarithm of procedures, the logarithm of the time to enforcement, and the contract regulation index, respectively. As shown, trust negatively and

⁸We use pooled OLS over random effects, given the method's simplicity and straightforward assumptions. However, we rerun all the regressions presented in the following tables, using a random effects model. The results are unchanged and are available upon request.

⁹Robust standard errors are clustered by country. No country is available across all four time periods. A total of 46 countries enter into the data set once, 32 enter twice, and 11 enter three times.

¹⁰For robustness, we report several estimations utilizing annual data.

¹¹The results are robust to replacing English legal origin with three civil law dummy variables (French, German, and Scandinavian).

TABLE 2 Trust and contract regulation

This table reports the results of OLS regressions with measures of contract regulation as the dependent variable and trust as the primary independent variable. The variable *In Procedures* is the logarithm of the number of procedural steps to enforce a commercial contract through the relevant court; *In Time* is the number of calendar days from the filing of a lawsuit until payment, measured in logarithmic form; *Contract regulation index* is the first principal component of the number of procedures and the number of days to enforce a commercial contract; *Trust* is the percentage of respondents answering that most people can be trusted; *Family trust*, *Personal trust*, and *Anonymous trust* are the percentages of respondents answering that they can trust most people in their family, individuals they know personally, and individuals they meet for the first time, respectively; *Confidence in courts* and *Confidence in government* are the percentages of respondents answering they have a great deal of confidence in the courts and in the government, respectively; and *English legal origin* is an indicator equal to 1 if a country was colonized by Britain and English legal code was transferred. Each model includes period fixed effects and regional controls. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	In Procedures	In Time	Contract regulation index						
Trust	-0.045** (0.015)	-0.086** (0.042)	-0.266*** (0.069)	-0.247*** (0.072)	-0.273*** (0.076)	-0.257** (0.101)	-0.270** (0.114)	-0.264*** (0.075)	-0.304*** (0.065)
Family trust					0.016 (0.022)				
Personal trust						-0.003 (0.009)			
Anonymous trust							0.000 (0.009)		
Confidence in courts								-0.001 (0.005)	
Confidence in government									-0.001 (0.003)
English legal origin	-0.021 (0.052)	0.051 (0.113)	0.054 (0.231)	0.253 (0.278)	0.276 (0.291)	0.288 (0.291)	0.260 (0.298)	0.275 (0.278)	0.052 (0.254)

(Continues)

TABLE 2 Continued

Dep. variable:	In Procedures (1)	In Time (2)	Contract regulation index (3)	Contract regulation index (4)	Contract regulation index (5)	Contract regulation index (6)	Contract regulation index (7)	Contract regulation index (8)	Contract regulation index (9)
Period fixed effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	Yes	No	No	No	No	No
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.344*** (0.179)	5.927*** (0.207)	-0.864 (0.632)	-2.004** (0.643)	-3.006 (2.089)	-1.285 (0.997)	0.714 (0.570)	-1.383* (0.745)	-0.852 (0.656)
No. of observations	138	138	138	106	97	97	96	99	133
Adj. R ²	34%	31%	39%	42%	38%	37%	36%	37%	39%

significantly predicts contract regulation. These findings suggest that more trusting countries adopt fewer contract regulations, including fewer procedures and fewer days to enforce a commercial contract. Marginal effects suggest that a one standard deviation increase in trust leads to an approximately 4.5% decrease in the number of procedures (a decrease of more than 0.2 standard deviations).¹² As shown in column (3), a one standard deviation increase in trust, the difference between New Zealand and Belarus, lowers the contract regulation index by 0.27 standard deviations, the difference between the United States and China. As a sensitivity check, we replicate column (3) with annual data, as reported in column (4). The results are qualitatively similar.

English legal origin is nonsignificant in all four specifications. Comparing across *R*-squared values, our baseline specifications explain 31–42% of the variation in contract regulation.

As discussed above, generalized trust is our main measure of trust, since it represents the strongest theoretical connection between trust and contracting. However, it is possible that respondents have a particular person or group of persons in mind when answering the question of whether most people can be trusted. Therefore, trust measures contained in the survey could be biased, not capturing the intent of the question. We therefore include three additional measures of trust from the WVS: family trust, personal trust, and anonymous trust. These are measured as the percentage of respondents answering “yes” to the following questions: “Do you trust your family?”, “Do you trust people you know personally?”, and “Do you trust people you meet for the first time?” These specifications are presented in columns (5)–(7) of Table 2. As shown, generalized trust remains significant with the inclusion of each additional measure of trust.¹³

Prior works have shown that trust increases confidence in formal institutions (Tabellini, 2008, 2010). To further distinguish the role of generalized trust, we control for two measures of confidence in specific institutions: the courts and the government. We utilize WVS questions asking how much confidence the respondent has in the courts and in government. Arguably, these questions relate to how much trust a person has in each area (Hwang, 2017). It is plausible that the effect of trust on court regulation is channeled through its effect on trusting the court system or trusting government. For example, a more distrusting individual could have less confidence in the court system and therefore demand court regulatory measures. Raw correlations suggest this could be the case, since trust is positively correlated with court confidence (0.42) and confidence in government (0.18).

Each confidence measure is included in the baseline specification with generalized trust in Table 2, columns (8) and (9). Trust remains negative and highly significant in each specification, and no confidence measure is significant.¹⁴ This suggests that trust has a direct impact on contract regulation.

In untabulated results, we examine the robustness of the association between contract regulation and trust while controlling for other measures of culture that could impact the level of regulation (Benabou, Ticchi, & Vindigni, 2015; Cline & Williamson, 2017; Davis & Williamson, 2016; Gorodnichenko & Roland, 2011; Stulz & Williamson, 2003). This includes controlling for a country's ethnic structure, religion, Hofstede's (2001) culture measures, and a

¹²The marginal effects in non-logarithmic form indicate that an increase in trust of 10 percentage points is associated with approximately one fewer procedure and 38 fewer days to enforcement.

¹³Although correlation tests indicate that it is appropriate to include generalized trust with the other three measures, for robustness we also run models excluding it. In untabulated tests, we find that personal trust and anonymous trust are negative and significant, while family trust is nonsignificant.

¹⁴If we drop generalized trust from the specification, each confidence measure remains nonsignificant.

measure of individual versus government responsibility. Trust remains negative and significant in all specifications, indicating that the link between trust and regulation is not driven by omitted cultural variation.

Since the demand for regulation is expressed through the political process, contract regulations are likely influenced by formal political institutions (Djankov et al., 2002). Therefore, we test the sensitivity of our findings to political controls, including democracy, history of statehood, regulatory quality, and government effectiveness. Trust remains negative and significant. We also include economic factors that could influence contract enforcement regulation, namely, educational attainment, economic growth, trade, foreign direct investment, and income per capita (Ahlquist & Prakash, 2010; Ranjan & Lee, 2007). The impact of trust on contract regulation remains negative and significant. All analyses not tabulated here are available upon request.

Collectively, these results suggest that the association between trust and regulation is negative and robust to the inclusion of alternative trust measures, political institutional quality, economic indicators, and cultural factors. We do not rule out reverse causality where regulation affects the level of trust in a society (Aghion et al., 2010), supporting the notion that regulation and trust coevolve (Carlin et al., 2009; Tabellini, 2008). More importantly, at least part of the negative association between trust and contract regulation is plausibly due to a causal link from distrust to greater demand for government intervention. Thus, we interpret the coefficients in Table 2 as partial correlations between trust and contract regulation.

4.2 | Trust, regulation, and contracting outcomes

An overarching implication of the results presented above is that trust can help facilitate an environment in which burdensome contract regulation is unnecessary. Previous works document that heavier contract regulations are associated with worse financial and economic outcomes. As we demonstrate, however, distrust is driving the demand for regulation. Omitted variation in trust could therefore confound inferences about the effects of contract regulations. In addition, if trust serves as an alternative to formal contract enforcement, we should observe positive contracting outcomes. We next test our hypothesis that generalized trust is associated with efficient contracting institutions.

In Table 3, we report tests for this hypothesis by directly examining contract regulation, trust, and contracting outcomes. We choose outcome measures that should theoretically be positively associated with contracting institutions and represent scenarios where contract enforcement takes place. Recall that our five contracting outcomes are the size of the shadow economy, the rule of law, auditing quality, venture capital availability, and firm R&D expenditure. These outcomes represent proxies indicating the enforcement of contracts, although the source of the enforcement could stem from both formal and informal sources.

We first examine the impact of contract regulation in Panel A of Table 3. Using a model similar to that reported in Table 2, we include the contract regulation index as the primary independent variable and control for English legal origin and regional and period dummies. In addition, to control for the size of financial markets, we include the market capitalization of listed firms (percentage of GDP, in logarithmic form). As predicted by the literature, an increase in contract regulation is significantly associated with worse contracting outcomes in three of the five estimations. The results indicate that heavier contract regulation increases the shadow economy and decreases venture capital and R&D expenditure. This result suggests that, when

TABLE 3 Trust, contract regulation, and contracting outcomes

This table reports the results of OLS tests of the association between trust and contract regulation on proxies for a healthy contracting environment. Panel A reports the results of tests of the impact of contract regulation on five outcomes from a healthy contracting environment. Panel B includes trust. The variable *Shadow economy* measures the size of the unofficial economy, as a percentage of GDP; *Rule of law* measures the extent to which agents have confidence in and abide by the rules of society; *Auditing quality* is the average firm response to a question regarding the strength of financial auditing and reporting standards; *Venture capital* is the average firm response to a question about the ease with which entrepreneurs can secure venture capital for risky projects; and *R&D expenditure* is the average firm response to a question regarding the extent to which companies spend on R&D. Detailed descriptions of all the variables are included in the text and Appendix A. Each model includes period fixed effects and regional controls. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. variable:	Shadow economy (1)	Rule of law (2)	Auditing quality (3)	Venture capital (4)	R&D expenditure (5)
Panel A: Contract regulation and contracting outcomes					
Contract regulation index	0.161* (0.090)	-0.129 (0.088)	-0.077 (0.101)	-0.138* (0.079)	-0.282*** (0.080)
ln Market cap (% GDP)	-0.368*** (0.071)	0.318** (0.121)	0.464*** (0.116)	0.411*** (0.092)	0.435*** (0.125)
English legal origin	-0.125 (0.206)	0.584** (0.193)	0.766** (0.226)	0.456** (0.223)	-0.251 (0.205)
Period fixed effects	Yes	Yes	Yes	Yes	Yes
Regional controls	Yes	Yes	Yes	Yes	Yes
Constant	0.100 (0.347)	0.454 (0.286)	-0.527 (0.498)	-0.322 (0.382)	0.599* (0.329)
No. of observations	116	117	86	86	86
Adj. R ²	38%	39%	36%	57%	51%
Panel B: Trust, contract regulation, and contracting outcomes					
Trust	-0.335*** (0.067)	0.296*** (0.073)	0.302*** (0.076)	0.298*** (0.070)	0.232** (0.083)
Contract regulation index	0.043 (0.093)	-0.024 (0.092)	0.036 (0.114)	-0.026 (0.088)	-0.195** (0.083)
ln Market cap (% GDP)	-0.348*** (0.069)	0.302** (0.113)	0.457*** (0.107)	0.404*** (0.080)	0.429*** (0.113)
English legal origin	-0.144 (0.195)	0.601** (0.202)	0.806** (0.239)	0.496** (0.232)	-0.220 (0.230)
Period fixed effects	Yes	Yes	Yes	Yes	Yes
Regional controls	Yes	Yes	Yes	Yes	Yes
Constant	-0.216 (0.310)	0.332 (0.258)	-0.567 (0.544)	-0.362 (0.419)	0.568 (0.349)
No. of observations	116	117	86	86	86
Adj. R ²	46%	46%	44%	64%	55%

countries adopt more procedures and it takes longer to enforce contracts through the courts, individuals are less likely to engage in activities that rely on the ability to enforce contracts, decreasing the efficiency of contracting institutions.

In Panel B of Table 3, we include trust in the specifications. In all the regressions, trust significantly improves contracting outcomes. This result indicates that, in more trusting societies, contracts are perceived to be enforced, and contract-intensive activities occur more often. For example, column (1) shows that a one standard deviation increase in trust decreases the shadow economy by one-third of a standard deviation. The adjusted *R*-squared values suggest that we explain between 44% and 64% of the variation in contracting institutions. For robustness, we replicate Table 3, Panel B, utilizing annual data instead of data averaged over 4-year periods. As reported in Appendix C, trust is significant in all five specifications; simultaneously, contract regulation is nonsignificant in all five estimations. Therefore, our results are not biased by the construction of the data. However, the number of observations is reduced with annual data, so we continue using averaged data in the remaining analysis.

Overall, our results suggest that trust directly increases the efficiency of contracting institutions. Combined with the results above showing that trust is negatively associated with contract regulation, we view this as indicating trust substituting for formal contract enforcement.

We find no evidence that formal regulation substitutes for lack of trust, since the contract regulation index is nonsignificant in most specifications. This result indicates that previous works identifying a negative impact from contract regulations suffer from omitted variable bias.¹⁵ Our results indicate that trust is a more robust predictor of efficient contracting outcomes. In addition, the nonsignificance of the contract regulation index for most of the regressions could indicate that individuals have other recourse to enforce contracts and secure property rights outside the formal court system. When the courts are highly regulated, individuals can rely on private arrangements based on trust to enforce contracts. Thus, contract regulation does not prohibit contract-intensive exchanges.

Next, we examine the robustness of the association between trust and contract-efficient institutions by including additional control variables. To conserve space, these results are not tabulated here but are available upon request.

We first include confidence in the court system to minimize concern that the effect of trust on the efficiency of contracting institutions is channeled through its effect on trusting the court system. Trust is robust to its inclusion, with one exception: trust is no longer significantly associated with R&D expenditure; contract regulation, however, retains its negative and significant coefficient in this specification. Confidence in the courts is positively and significantly correlated with R&D expenditures, suggesting that trust indirectly impacts contracting outcomes by increasing confidence in the courts. Confidence in the courts also significantly increases the rule of law and auditing quality.

We next include a dummy variable equal to 1 if a country is landlocked. Being landlocked provides an exogenous geographic measure that is linked to institutional quality through its effect on colonization and institutional transfer (Hall & Jones, 1999; Williamson & Kerekes, 2011). It is also a proxy for Olson's (1982) argument that exposure to international trade

¹⁵In estimations that do not include trust or stock market capitalization, contract regulation is significantly associated with worse contracting outcomes in all five specifications. If we include trust without including stock market capitalization, we find similar results to those when it is included. The one exception is for venture capital. Contract regulation is negative and significant at the 10% level. This indicates that trust is an important omitted variable in prior works, and not simply driven by the level of financial development. The results are not tabulated but are available upon request.

increases the pressure to reform inefficient regulation. Trust is significant in all five specifications, with the expected sign and similarly sized coefficients. Contract regulation is only significant for the R&D specification. The state of being landlocked is nonsignificant in four of the five specifications.

Lastly, we include an exogenous proxy for political institutional quality captured by a measure of state history (Bockstette, Chanda, & Putterman, 2002). State history is positively associated with the provision of public goods and economic development, so a country with a longer state history could develop better contracting rules. Trust is robust to this inclusion, and contract regulation has the same effect as before. State history is nonsignificant in four of the five specifications.

4.3 | Trust and regulation interaction effects

To further examine the relation between trust, regulation, and contracting institutions, we analyze the interaction between trust and regulation on contracting outcomes. In Table 4, we include the interaction between trust and the contract regulation index. Panel A reports the OLS estimations, and Panels B and C report the marginal effects at various levels of trust and regulation, respectively.

As shown in Panel A of Table 4, trust retains its independent and significant association with contracting institutions in all five specifications. Contract regulation remains negative and significant in the R&D specification. The interaction term is significant only in the shadow economy specification.

Panel B of Table 4 calculates the marginal effects of trust at the 25th percentile, the mean, and the 75th percentile of the contract regulation index. In countries with low levels of contract regulation (25th percentile), trust is highly significant. This result indicates complementarity between trust and formal enforcement. The court system can enforce financial contracts, but, without trust, it is costly to enforce all aspects of complex financial transactions. This result suggests that, even in countries with less regulated court systems, trust is an important factor in contract efficiency. For example, a one standard deviation increase in trust in a less regulated country, such as Norway, reduces the shadow economy by 0.39 standard deviations.

As regulation increases to the level of the mean, trust remains significant in all five specifications. For example, a one standard deviation increase in trust in a country with an average level of contract regulation, such as Burkina Faso or Albania, increases the rule of law and auditing quality by about 0.29 standard deviations. As one moves toward more highly regulated countries, trust begins to lose importance, retaining significance in three of five specifications. This result could indicate that, as countries become highly regulated, reliance on trust to enforce contracts becomes increasingly difficult.

Overall, the results suggest that trust is an important determinant of contracting outcomes. Depending on the level of regulation, we find that trust can complement or substitute for formal contract regulation. In less regulated countries, trust is important, suggesting that trust and formal contract enforcement are complementary in promoting efficient contracting institutions. As regulation increases, we find that trust substitutes for formal enforcement. However, it becomes more difficult for trust to substitute for high levels of regulation.

Panel C of Table 4 reports the marginal effects of contract regulation on various levels of trust. As shown, contract regulation is almost never significant, regardless of the level of trust in a country. Regulation has virtually no impact on contracting efficiency once we condition its

TABLE 4 Trust, contract regulation, and contracting outcomes—Interaction effects

This table reports the results of OLS tests of the interaction effects between trust and contract regulation on proxies for a healthy contracting environment. Panel A reports the results including the interaction between trust and the contract regulation index. Panel B reports the marginal effects of trust conditional on levels of regulation. Panel C reports the marginal effects of regulation conditional on various trust levels. Detailed descriptions of all the variables are included in the text and Appendix A. Each model includes period fixed effects and regional controls. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. variable:	Shadow economy (1)	Rule of law (2)	Auditing quality (3)	Venture capital (4)	R&D expenditure (5)
Panel A: Interaction effects					
Trust	-0.275** (0.082)	0.289*** (0.082)	0.287** (0.100)	0.268** (0.084)	0.181* (0.092)
Contract regulation index	0.072 (0.095)	-0.027 (0.094)	0.029 (0.121)	-0.040 (0.094)	-0.218** (0.088)
Trust × Contract regulation index	0.166** (0.083)	-0.019 (0.093)	-0.029 (0.131)	-0.060 (0.125)	-0.103 (0.106)
In Market cap (% GDP)	-0.336*** (0.068)	0.300** (0.113)	0.452*** (0.109)	0.394*** (0.083)	0.414*** (0.115)
English legal origin	-0.122 (0.189)	0.598** (0.204)	0.788** (0.272)	0.459* (0.273)	-0.283 (0.272)
Period fixed effects	Yes	Yes	Yes	Yes	Yes
Regional controls	Yes	Yes	Yes	Yes	Yes
Constant	0.168 (0.293)	-0.062 (0.242)	0.048 (0.214)	-0.590** (0.215)	-0.223 (0.232)
No. of observations	116	117	86	86	86
Adj. R ²	47%	45%	44%	64%	55%
Panel B: Marginal effects of trust, conditional on levels of regulation					
25th percentile	-0.393***	0.303***	0.311***	0.317***	0.265***
Mean	-0.286***	0.291***	0.290***	0.275***	0.193**
75th percentile	-0.177	0.278**	0.271*	0.235*	0.125
Panel C: Marginal effects of regulation, conditional on levels of trust					
25th percentile	-0.059	-0.012	0.053	0.009	-0.135
Mean	0.086	-0.029	0.026	-0.046	-0.228**
75th percentile	0.210	-0.044	0.005	-0.090	-0.304**

effect on trust, supporting the result of Pinotti (2012). The exception is with R&D expenditures. In countries with a mean level of trust or higher, contract regulation significantly decreases R&D expenditures. This could suggest that, due to the inefficiency of formally enforcing a contract in the courts, companies are less likely to engage in R&D, even in high-trust countries. This indicates that, at high levels of regulation, trust is incapable of fully substituting for formal contract enforcement.

Collectively, these results indicate that trust is a strong negative predictor of contract enforcement regulation. The negative association between contract enforcement regulation and contracting outcomes is almost eliminated once we account for the level of trust in a country. However, trust significantly influences the efficiency of contracting institutions regardless of the level of regulation.

5 | ADDRESSING CAUSALITY

5.1 | IV analysis

The coefficients on the association between trust, regulation, and contracting outcomes potentially suffer from biased estimation. For example, some factor that was not included could influence regulation, trust, and the efficiency of contracting. Both Aghion et al. (2010) and Pinotti (2012) argue that the causality flows from trust to regulation, so endogeneity is still a concern. Greater regulation could increase the ability to trust, supporting a positive reinforcement effect. In our particular case, trust is negatively related to contract regulation. Thus, positive feedback is not likely. On the contrary, burdensome regulation could encourage dishonesty and renegeing on agreements if one party does not believe the contract will actually be enforced due to excessive costs; thus, higher regulation could decrease trust. In addition, reverse causation is possible. Countries that experience a greater rule of law and fewer activities in the shadow economy, for example, are more likely to foster greater levels of generalized trust.

We address these potential concerns by estimating two-stage least squares regressions. We instrument for trust using two instruments identified in the literature on the economics of culture: pronoun drop (Davis & Abdurazokzoda, 2016; Kashima & Kashima, 1998) and genetic distance (Gorodnichenko & Roland, 2011, 2017; Spolaore & Wacziarg, 2009). Since pronoun drop and genetic distance do not directly determine regulation or contracting outcomes, we use both variables as a source of exogenous variation in trust.

Pronoun drop refers to grammatical rules of pronominal expression that govern whether a speaker is allowed to drop a pronoun in the subject position. For example, pronoun drop is permitted in Spanish, such that the English sentence “I speak” can be translated as either “Hablo” or “Yo hablo”; however, this is not permitted in English, since the pronoun “I” is required to make sense of the sentence. In languages that permit pronoun drop, the identity of the subject is understood within the context of the rest of the sentence. In contrast, in languages that do not permit pronoun drop, the subject stands apart from the context.

Pronoun drop is therefore associated with more collectivist cultures and limited morality (Kashima & Kashima, 1998; Licht, Goldschmidt, & Schwartz, 2007; Tabellini, 2008). We follow Tabellini’s argument in theorizing that cultures speaking a language that forbids dropping the personal pronoun have stronger respect for individual rights; therefore, they have also developed stronger norms of generalized trust. We expect pronoun drop to negatively predict generalized trust, since trusting societies are associated with generalized morality. Our data are collected from Davis and Abdurazokzoda (2016). In our analysis, pronoun drop is coded as 1 if a country’s population speaks a language in which pronoun drop is permitted, and 0 otherwise.

The second instrument is a measure of a country’s genetic distance from Norway, based on the similar unexpressed genetic material. Spolaore and Wacziarg (2009) argue that, like genetic information, cultural values are transmitted from parent to child, making genetic distance “an excellent summary statistic capturing divergence in the whole set of implicit beliefs, customs,

habits, biases, conventions, etc. that are transmitted across generations.” Gorodnichenko and Roland (2011, 2017) extend this logic to propose genetic distance as an instrument for culture. Guiso et al. (2009) use genetic likeness as an instrument for trust, arguing that individuals find it easier to trust strangers who look, sound, and act more like them.

Since Norway has the highest value for trust in our data set (73.7%), we use genetic distance from Norway as an instrument for trust. As a country becomes more genetically distant from Norway, individuals in those countries also become culturally distant, including differences in average trust levels. For example, in our sample, the most genetically distant countries from Norway are Tanzania and Uganda. Both are distrusting countries, with only 7.6% of individuals in Uganda and 7.7% in Tanzania believing most people can be trusted. We therefore expect genetic distance to negatively associate with trust. The data are collected from Spolaore and Wacziarg (2009).

Both instruments are negative and significantly correlated with trust (0.40 for pronoun drop and 0.25 for genetic distance) at the 5% level. This result implies that the use of pronoun drop and genetic distance from Norway leads to lower levels of trust. The first-stage results support the use of these instruments, as shown in Panel A, Table 5. The adjusted R -squared values in each model are well above the 0.20 benchmark, and F -statistics of excluded instruments suggest that we should not be overly concerned with weak instruments.

As reported in Panel B of Table 5, the association of trust with contracting outcomes is robust to controlling for endogeneity. Trust is significant at the 5% level in four of five specifications. Trust is positive and marginally significant in the auditing quality regression. The coefficients are slightly larger compared to those in the OLS estimations, suggesting that OLS regression underestimates the effect of trust. For example, a one standard deviation increase of the exogenous portion of trust decreases the shadow economy by 0.5 standard deviations and increases the rule of law by 0.55 standard deviations. We note that contract regulation remains nonsignificant to controlling for endogeneity; however, it is negative and significant at the 10% level in the specification explaining R&D expenditures (it is significant at the 5% level in the OLS estimation with a larger coefficient). The Hansen J overidentification restriction test results suggest that we cannot reject the exclusion restriction on the maintained hypothesis that at least a subset of the instruments is valid.

As in the OLS estimates, we include additional control variables to reduce concerns regarding omitted variable bias: court confidence, the state of being landlocked, and state history. Trust is robust to these inclusions. We do not tabulate the results here to save space, but they are available upon request.

5.2 | Trust and regulation interaction effects with IV analysis

We address concerns about endogeneity and the measurement of trust in our conditional effects estimations by instrumenting for both trust and the interaction between trust and the contract regulation index. Our set of instruments includes the two variables discussed in the previous section (pronoun drop and genetic distance from Norway) and interactions between these variables and the contract regulation index. The results are presented in Table 6.

As shown in Panel B of Table 6, the magnitude of the marginal effects from the IV estimation is greater than its value estimated under OLS, suggesting that OLS could understate the interdependent effect. In all five specifications, a one standard deviation increase in trust in countries with lower contract regulation significantly decreases the shadow economy by 0.65

TABLE 5 Trust, contract regulation, and contracting outcomes with IV estimation

This table reports, we instrument for trust using *Pronoun drop* and *Genetic distance*, where *Pronoun drop* is a dichotomous variable indicating that a country's grammatical rules allow for pronoun drop and *Genetic distance* measures a country's genetic distance from Norway, based on the similarity of unexpressed genetic material. Panel A reports the first-stage regressions with *Trust* as the dependent variable. Panel B presents the second-stage results. Detailed descriptions of all the variables are included in the text and Appendix A. Each model includes period fixed effects and regional controls. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively, and ^ denotes significance at the 11% level. In Panel A, the first stage *F*-statistic is the Sanderson–Windmeijer multivariate *F*-test of excluded instruments. Panel B reports Hansen's *J* *p*-values

Dep. variable:	Panel A: First stage			Panel B: Second stage				
	Trust (1)	Trust (2)	Trust (3)–(5)	Shadow economy (1)	Rule of law (2)	Auditing quality (3)	Venture capital (4)	R&D expenditure (5)
Pronoun drop	−0.745*** (0.217)	−0.732*** (0.214)	−0.966** (0.282)					
Genetic distance	−0.241** (0.101)	−0.244** (0.100)	−0.164 (0.111)					
Trust				−0.506** (0.215)	0.557** (0.221)	0.293^ (0.184)	0.359** (0.156)	0.427** (0.198)
Contract regulation index	−0.255** (0.103)	−0.255** (0.103)	−0.214* (0.126)	0.039 (0.081)	0.036 (0.105)	0.017 (0.109)	0.009 (0.100)	−0.165* (0.087)
ln Market cap (% GDP)	−0.046 (0.091)	−0.035 (0.083)	−0.075 (0.110)	−0.356*** (0.074)	0.323** (0.112)	0.459*** (0.102)	0.405*** (0.075)	0.447*** (0.104)
English legal origin	−0.418 (0.291)	−0.418 (0.291)	−0.605* (0.341)	−0.202 (0.187)	0.608** (0.212)	0.815*** (0.226)	0.487** (0.227)	−0.158 (0.240)
Period fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.729* (0.410)	1.069** (0.537)	0.510 (0.817)	−0.140 (0.307)	0.167 (0.250)	0.089 (0.205)	−0.470** (0.212)	0.050 (0.249)
No. of observations	104	105	77	104	105	77	77	77

(Continues)

TABLE 5 Continued

Dep. variable:	Panel A: First stage		Panel B: Second stage					
	Trust (1)	Trust (2)	Trust (3)-(5)	Shadow economy (1)	Rule of law (2)	Auditing quality (3)	Venture capital (4)	R&D expenditure (5)
Adj. R^2	0.409	0.413	0.475	0.462	0.393	0.431	0.628	0.542
First-stage F -statistic	8.56***	8.40***	8.1***					
Hansen J p -value				0.38	0.12	0.47	0.25	0.99

TABLE 6 Trust, contract regulation, and contracting outcomes with IV estimation: Interaction effects

This table reports the IV results, including an interaction term between trust and contract regulation. We instrument for trust using *Pronoun drop* and *Genetic distance*; for the interaction term, we instrument with *Pronoun drop* \times *Contract regulation index* and *Genetic distance* \times *Contract regulation index*. Panel A reports the results, including the interaction of trust and contract regulation index. Panel B reports the marginal effects of trust conditional on levels of regulation. Panel C reports the marginal effects of regulation conditional on various trust levels. Detailed descriptions of all the variables are included in the text and Appendix A. Each model includes period fixed effects and regional controls. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively. Hansen's *J* *p*-values are reported in the last row of Panel A.

Dep. variable:	Shadow economy (1)	Rule of law (2)	Auditing quality (3)	Venture capital (4)	R&D expenditure (5)
Panel A: Interaction effects					
Trust	−0.782** (0.294)	0.892** (0.296)	0.473 (0.314)	0.704** (0.348)	0.675** (0.303)
Contract regulation index	−0.067 (0.129)	0.174 (0.144)	0.097 (0.180)	0.162 (0.219)	−0.063 (0.158)
Trust \times Contract regulation index	−0.171 (0.267)	0.353 (0.242)	0.196 (0.305)	0.380 (0.362)	0.141 (0.299)
ln Market cap (% GDP)	−0.376*** (0.094)	0.366** (0.119)	0.494*** (0.114)	0.473*** (0.112)	0.474*** (0.120)
English legal origin	−0.225 (0.233)	0.647** (0.281)	0.933** (0.337)	0.717* (0.369)	−0.064 (0.385)
Period fixed effects	Yes	Yes	Yes	Yes	Yes
Regional controls	Yes	Yes	Yes	Yes	Yes
Constant	−0.473 (0.455)	0.690 (0.424)	0.369 (0.471)	0.072 (0.532)	0.332 (0.463)
No. of observations	104	105	77	77	77
Adj. R^2	0.318	0.188	0.391	0.484	0.442
Hansen <i>J</i> <i>p</i> -value	0.01	0.34	0.89	0.2	0.36
Panel B: Marginal effects of trust, conditional on levels of regulation					
25th percentile	−0.651***	0.630**	0.314*	0.395***	0.561***
Mean	−0.760***	0.845***	0.440*	0.640**	0.651**
75th percentile	−0.873**	1.072***	0.560	0.872*	0.738*
Panel C: Marginal effects of regulation, conditional on levels of trust					
25th percentile	0.069	−0.109	−0.060	−0.143	−0.176
Mean	−0.082	0.201	0.113	0.193	−0.052
75th percentile	−0.210	0.469	0.258	0.474	0.053

standard deviations and significantly increases the rule of law, auditing quality, venture capital accessibility, and R&D spending by 0.63, 0.31, 0.40, and 0.56 standard deviations, respectively. As the courts become more regulated to enforce commercial contracts, the magnitude of trust is amplified in most specifications. For example, in a highly regulated country, a one standard

deviation increase in trust leads to a standard deviation increase in the rule of law of more than 1.00 at the 1% significance level. Collectively, these results suggest that, as contract regulation increases, trust substitutes for formal enforcement to promote contracting efficiency.

In highly regulated countries, the significance of trust is less consistent. We do find substitution for our two general measures of contracting institutions, that is, the size of the shadow economy and the rule of law. For our contracting measures that rely more on explicit contracting (auditing quality, access to venture capital, and R&D spending), we find that trust is less important when the courts are heavily regulated. This finding could indicate that reliance on trust to enforce contracts becomes increasingly difficult as the courts become overly regulated.

As reported in Panel C of Table 6, contract regulation has no impact on contracting outcomes. In both low- and high-trust countries, contract enforcement regulation neither helps nor hinders contracting efficiency.

TABLE 7 Trust, contract regulation, and contracting outcomes with IV estimation: Subsamples

This table reports the IV results of splitting the sample at the mean of the contract regulation index. We instrument for trust using *Pronoun drop* and *Genetic distance*. Panel A reports the results for countries with lower levels of regulation, and Panel B reports the results for countries with higher levels of regulation. Detailed descriptions of all the variables are included in the text and Appendix A. Each model includes period fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively. Hansen's J p -values are reported in the last row of each panel.

Dep. Variable:	Shadow economy	Rule of law	Auditing quality	Venture capital	R&D expenditure
	(1)	(2)	(3)	(4)	(5)
Panel A: Lower regulatory country subsample					
Trust	-0.649** (0.244)	0.814** (0.266)	0.533** (0.230)	0.820*** (0.224)	0.751** (0.244)
English legal origin	-0.301 (0.230)	0.506* (0.261)	0.800*** (0.226)	0.530* (0.290)	0.112 (0.323)
Period fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	-0.139 (0.222)	0.018 (0.451)	-0.290 (0.315)	-0.877** (0.305)	-0.106 (0.315)
No. of observations	61	63	50	50	50
Adj. R^2	0.331	0.076	0.162	0.310	0.118
Hansen J p -value	0.14	0.16	0.55	0.99	0.98
Panel B: Higher regulatory country subsample					
Trust	-1.573*** (0.336)	0.699** (0.246)	-0.039 (0.471)	0.048 (0.541)	-0.215 (0.558)
English legal origin	-0.125 (0.324)	0.232 (0.251)	0.963** (0.296)	0.683** (0.294)	0.414 (0.296)
Period fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	-0.817* (0.425)	0.059 (0.277)	-0.487 (0.396)	-0.534 (0.365)	-0.683** (0.328)
No. of observations	49	53	34	34	34
Adj. R^2	-0.172	-0.034	0.135	0.105	-0.213
Hansen J p -value	0.10	0.02	0.67	0.96	0.77

Trust continues to have independent significant coefficients in four of the five specifications, while the independent effect of the contract regulation index is nonsignificant in all five specifications. The final row of Panel A in Table 6 reports the results of the overidentification restriction test. All specifications pass, except when the size of the shadow economy is the dependent variable.

To further provide support for our hypothesis that trust substitutes for formal contract enforcement when formal enforcement is costly, we estimate our IV results using subsamples. We create two subsamples of countries, low- and high-contract regulation countries, splitting the sample at the mean of the contract regulation index. We continue to instrument for trust with pronoun drop and genetic distance from Norway. Due to the small number of observations across the two samples, we estimate a restricted model, dropping regional dummies and the logarithm of market capitalization.

The results are presented in Table 7. Panel A reports the findings for less regulated countries. The exogenous portion of trust is significant at the 5% level or better in all five regressions. This result suggests that trust is an important factor for the efficiency of contracting outcomes, even when the courts are less regulated. Thus, trust and formal enforcement can complement each other to increase efficiency. For example, a one standard deviation increase in trust increases venture capital availability by over 0.80 standard deviations in countries with less regulated courts. All specifications pass the overidentification restriction test.

The results for high-contract regulation countries are presented in Panel B of Table 7. In this sample, trust has a weaker collective effect across the specifications. Its strongest effect is reported in column (1), where a one standard deviation increase in trust significantly decreases the shadow economy by over 1.5 standard deviations. It also significantly increases the rule of law, although this specification fails to pass the Hansen *J* overidentification test. In columns (3)–(5), the effect of trust on auditing quality, venture capital accessibility, and R&D spending is nonsignificant. These results could suggest that, at a certain point, trust can no longer fully substitute for lack of formal contract enforcement to promote contracting outcomes. For our contracting measures, which rely more on explicit contracting (auditing quality, access to venture capital, and R&D expenditure), we find that trust is less important when the courts are heavily regulated.

We view these subsample results as providing additional support to our finding that trust can complement low levels of regulation and substitute for it in highly regulated countries, albeit not perfectly. We note the low number of observations in the subsample specifications.

6 | CONCLUSION

Contract regulations are often created to facilitate transactions between private parties for the purpose of benefiting from economic exchange. We hypothesize that generalized trust in a society fosters a preference for less governmental control over the courts, and this results in less overall contract regulation. The results of our analysis offer significant support for this hypothesis. One implication of our findings is that trust substitutes for formal contract regulation; thus, we further hypothesize and find empirical support that trust directly creates a good environment for efficient contracting outcomes. In addition, once variation in trust is accounted for, the significant cost of regulation is mitigated. Overall, our findings indicate that regulation is not the reason for contracting inefficiency, as presented by Djankov et al. (2002); rather, it is lack of trust that explains inefficient contracting.

Collectively, these results suggest that trust can directly promote a positive contracting environment and substitute for costly formal contract regulation. Trust directly promotes contracting

efficiency, which indicates that trust is a complement to contracting, and not a substitute. The policy implications of our work are more challenging to specify, since trust can be difficult to manipulate. This study does suggest, however, that policy-makers are constrained by trust, and, to promote efficient contract enforcement, they might need to think beyond regulating toward a solution.

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APPENDIX A: DATA DESCRIPTION

Variable	Description	Source
<i>Contract regulation</i>		
In Procedures	Number of procedural steps to enforce a commercial contract through the relevant court. A procedure is defined as any interaction, required by law or commonly used, between the parties or between the parties and the judge or court officer. Other procedural steps, internal to the court or between the parties and their counsel, are also counted. Procedural steps include the steps to file and serve the case, to assign the case to a judge, and for trial and judgment and those necessary to enforce the judgment. Measured from 2003 to 2015, in logarithmic form.	World Bank (2016a)
In Time	Number of calendar days from the filing of a lawsuit until payment. Three stages are recorded: the time to file and serve, the time for trial and judgment, and the time for enforcement. Measured from 2003 to 2015, in logarithmic form.	World Bank (2016a)

(Continues)

Variable	Description	Source
Contract regulation index	First principal component of the number of procedures and the number of days to enforce a commercial contract. Measured from 2003 to 2015. The index is normalized, with a mean of 0 and a standard deviation of 1.	World Bank (2016a)
<i>Main controls</i>		
Trust	Percentage of respondents answering that most people can be trusted. Includes data from the last three surveys. Measured from 2000 to 2014. Normalized with a mean of 0 and a standard deviation of 1.	Inglehart et al. (2014)
Period fixed effects	A dummy variable equal to one for each of the four time periods: 2000–2003, 2004–2007, 2008–2011, and 2012–2015.	Authors' calculation
Regional controls	Dummy variables reflecting a country's location in the following regions: East Asia Pacific, Eastern and Central Europe, Middle East and North Africa, South Asia, Sub-Saharan Africa, Latin America, and North America.	World Bank (2016b)
English legal origin	Indicator variable equal to 1 if a country was colonized by Britain and English legal code was transferred, and 0 otherwise.	La Porta et al. (2008)
Family trust	Percentage of respondents answering that they somewhat or completely trust people from their family. Includes data from the last three surveys. Measured from 2000 to 2014.	Inglehart et al. (2014)
Personal trust	Percentage of respondents answering that they somewhat or completely trust people they know personally. Includes data from the last three surveys. Measured from 2000 to 2014.	Inglehart et al. (2014)
Anonymous trust	Percentage of respondents answering that they somewhat or completely trust people they meet for the first time. Includes data from the last three surveys. Measured from 2000 to 2014.	Inglehart et al. (2014)
Confidence in courts	Percentage of respondents answering that they have quite a lot or a great deal of confidence in the courts. Includes data from the last three surveys. Measured from 2000 to 2014.	Inglehart et al. (2014)
Confidence in government	Percentage of respondents answering they have quite a lot or a great deal of confidence in the government. Includes data from the last three surveys. Measured from 2000 to 2014.	Inglehart et al. (2014)
In Market cap (% GDP)	Market capitalization is the share price times the number of shares outstanding for listed domestic companies, as a percentage of the GDP. Measured from 2000 to 2015. In logarithmic form and normalized with a mean of 0 and a standard deviation of 1.	World Bank (2016b)
<i>Contracting outcomes</i>		
Shadow economy	Measures the size of the unofficial economy or informal economy, as a percentage of GDP. Normalized with a mean of 0 and a standard deviation of 1.	Hassan and Schneider (2016)

(Continues)

Variable	Description	Source
Rule of law	The extent to which agents have confidence in and abide by the rules of society, particularly the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Measured from 2000 to 2014. Normalized with a mean of 0 and a standard deviation of 1.	Kaufmann et al. (2015)
Auditing quality	Average firm response on a scale of 1–7 to the question, “In your country, how strong are financial auditing and reporting standards? (1 = extremely weak; 7 = extremely strong).” Measured from 2006 to 2014. Normalized with a mean of 0 and a standard deviation of 1.	Schwab and Sala-i-Martin (2015)
Venture capital	Average firm response on a scale from 1–7 to the question, “In your country, how easy is it for entrepreneurs with innovative but risky projects to find venture capital? (1 = extremely difficult; 7 = extremely easy).” Measured from 2006 to 2014. Normalized with a mean of 0 and a standard deviation of 1.	Schwab and Sala-i-Martin (2015)
R&D expenditure	Average firm response on a scale from 1–7 to the question, “In your country, to what extent do companies spend on research and development (R&D)? (1 = do not spend on R&D; 7 = spend heavily on R&D).” Measured from 2006 to 2014. Normalized with a mean of 0 and a standard deviation of 1.	Schwab and Sala-i-Martin (2015)
<i>Instruments</i>		
Pronoun drop	Dummy variable coded 0 or 1, where 1 indicates grammatical rules that allow for pronoun drop.	Davis and Abdurazokzoda (2016)
Genetic distance	Measure of a country's genetic distance from Norway based on the similarity of unexpressed genetic material. Normalized with a mean of 0 and a standard deviation of 1.	Spolaore and Wacziarg (2009)

APPENDIX B: COUNTRY LIST ($N = 89$)

Albania	Indonesia	Qatar
Algeria	Iran, Islamic Rep.	Romania
Argentina	Iraq	Russian Federation
Armenia	Ireland	Rwanda
Australia	Israel	Saudi Arabia
Azerbaijan	Italy	Serbia
Bangladesh	Japan	Singapore
Belarus	Jordan	Slovenia

(Continues)

Bosnia and Herzegovina	Kazakhstan	South Africa
Brazil	Korea, Rep.	Spain
Bulgaria	Kuwait	Sweden
Burkina Faso	Kyrgyzstan	Switzerland
Canada	Lebanon	Taiwan
Chile	Libya	Tanzania
China	Macedonia, FYR	Thailand
Colombia	Malaysia	Trinidad and Tobago
Cyprus	Mali	Tunisia
Ecuador	Mexico	Turkey
Egypt, Arab Rep.	Moldova	Uganda
Estonia	Montenegro	Ukraine
Ethiopia	Morocco	United Kingdom
Finland	Netherlands	United States
France	New Zealand	Uruguay
Georgia	Nigeria	Uzbekistan
Germany	Norway	Venezuela
Ghana	Pakistan	Vietnam
Guatemala	Peru	Yemen
Hong Kong	Philippines	Zambia
Hungary	Poland	Zimbabwe
India	Puerto Rico	

APPENDIX C: TRUST, CONTRACT REGULATION, AND CONTRACTING OUTCOMES: ANNUAL DATA

This table reports the results of OLS tests of the association between trust and contract regulation on proxies for a healthy contracting environment, using annual data instead of 4-year periods. The variable *Shadow economy* measures the size of the unofficial economy, as a percentage of GDP; *Rule of law* measures the extent to which agents have confidence in and abide by the rules of society; *Auditing quality* is the average firm response to a question regarding the strength of financial auditing and reporting standards; *Venture capital* is the average response to a question that measures the ease with which entrepreneurs can secure venture capital for risky projects; and *R&D expenditure* is the average firm response to a question regarding the extent to which companies spend on R&D. Detailed descriptions of all the variables are included in the text and Appendix A. Each model includes year fixed effects

and regional controls. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. variable:	Shadow economy	Rule of law	Auditing quality	Venture capital	R&D expenditure
	(1)	(2)	(3)	(4)	(5)
Trust	−0.316*** (0.073)	0.344*** (0.079)	0.284** (0.089)	0.318** (0.104)	0.278** (0.110)
Contract regulation index	−0.035 (0.109)	−0.005 (0.114)	0.135 (0.168)	0.064 (0.132)	−0.174 (0.148)
ln Market cap (% GDP)	−0.361*** (0.101)	0.264 (0.166)	0.427** (0.140)	0.405** (0.126)	0.426** (0.173)
English legal origin	0.089 (0.299)	0.557* (0.280)	0.928** (0.330)	0.651** (0.292)	0.021 (0.321)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Regional controls	Yes	Yes	Yes	Yes	Yes
Constant	0.655 (0.957)	0.245 (0.330)	−0.222 (0.698)	0.975 (0.673)	1.086 (0.703)
No. of observations	82	82	62	62	62
Adj. R^2	43%	39%	29%	58%	51%