Credibly Committing to Property Rights: The Roles of Precedent and the Constitution[*]

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Abstract

In cross-national studies, scholars typically ignore the moderating effect of credibility on the relationship between property rights protection and economic growth. However, both theory and case evidence suggest that credibility is necessary for this relationship to exist. Using panel data spanning more than 100 countries from 1985-2005, this paper investigates if two credibility mechanisms – precedent and the constitution – moderate the relationship between property rights protection and economic growth. The findings suggest that a credible commitment to property rights protection is a necessary condition for such protection to enhance economic performance. The implications of these findings are twofold: 1) property rights reforms are unlikely to be successful in countries that cannot credibly commit to those reforms, and 2) unsuccessful property rights reforms at present may reduce the likelihood that future reforms will be successful.

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Over the past few decades, scholars have argued that institutions explain variation in economic development across countries. These scholars posit that superior institutions explain why some countries have experienced far better economic performance than others. Although there is certainly evidence that better institutions lead to better economic outcomes (e.g. democratic institutions (Barro 1996), common law institutions (La Porta, Lopez-de-Silanes and Shleifer 2008), independent judicial institutions (Feld and Voigt 2003), etc.), the results of these studies are far from robust (Rodrik 2006).

The protection of private property rights is a prime example. Both theory and substantial empirical evidence support the notion that the economy will grow faster in countries where property rights are better protected. For example, over the last 20 years, the GDP of countries with higher than average property rights protection grew more than twice as fast as their counterparts with lower than average property rights protection - 1.09% compared to 2.47%. Moreover, only one country – Cameroon – with higher than average property rights protection experienced negative economic growth over this period compared to more than 25% of countries with lower than average property rights protection.[1] Numerous studies using a variety of methodological approaches have documented this empirical relationship (see, for example, North and Thomas 1973; North 1990; Knack and Keefer 1995; Keefer and Knack 1997; Acemoglu, Johnson and Robinson 2001). Such strong empirical support has led to widespread agreement among scholars and policy makers that secure property rights are necessary for long-term economic growth (Rodrik 2000; de Haan, Lundstrom and Sturm 2006; Kereks and Williamson 2008; King and Martinez 2010). In fact, as a result of this empirical support, some have touted property rights as the solution to underdevelopment and poverty in the non-Western world (de Soto 2000), and international financial organizations, such

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[1]These comparisons are made using *de facto* property rights data from Gwartney (2009) and data on economic growth from Heston et al. (2009). For the latter comparison, Cameroon's average economic growth was -0.28% from 1990-2005, probably as a result of Cameroon's dependence on commodities and the low commodity prices in the late 1980's and early 1990's.

as the World Bank, have actively supported property rights reform as a means to improve economic performance in developing countries (World Bank 2003).

Although property rights are almost certainly necessary for long-term economic growth, both anecdotal evidence and existing empirical research challenge the notion that simply adopting property rights protection is sufficient to spur economic growth in the near-term. Take El Salvador, for instance: in the aftermath of the Salvadoran Civil War, the country dramatically increased its level of property rights protection, and by 1995, its level of real property rights protection nearly matched that of the Central American country with the highest level of property rights protection – Costa Rica. Despite a similar level of property rights protection to Costa Rica, El Salvador's economy grew at a rate of only 0.5% from 1995 to 2005, a rate approximately 20% that of Costa Rica. El Salvador is not the only country to "under-perform" economically based on its level of property rights protection. From 1990-2005, almost 25% of countries with above average property rights protection had average rates of economic growth that were less than the mean rate of economic growth for countries with below average property rights protection. Moreover, recent scholarship finds that the level of property rights protection has little (or even no) effect on economic growth when this relationship is assessed within countries over time (Hausmann, Pritchett and Rodrik 2005; Jones and Olken 2008; King and Martinez 2010). At least based on this evidence, then, the protection of property rights seems to only lead to faster economic growth in some contexts.

The context-specific relationship observed between property rights protection and economic performance, as well as between other institutions and economic performance, has led some to question the use of institutional reforms as a solution underdevelopment (Rodrik 2006). In recent years, the World Bank has even softened their stance on these sorts of interventions (World Bank 2005). Still, institutional reform is potentially a powerful mechanism that countries can use to boost economic performance. One might even argue that, regardless of whatever policy reforms are implemented in underdeveloped countries, they will never achieve the economic performance of their developed counterparts while

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saddled with inferior institutions. Therefore, rather than using the heterogeneous effect of institutions to argue against making institutional reforms, one might instead use it to argue specifically against universal recommendations for reform (e.g. de Soto 2000; World Bank 2003), leaving open the possibility that such reforms might work in some contexts. We can then investigate the effect of institutions further to understand where specific institutional solutions to underdevelopment are most likely to be successfully applied.

Here, I offer an explanation for the observed heterogeneity in the relationship between property rights and economic growth in an effort to understand where property rights reforms might be expected to improve economic performance. Specifically, I argue that credibility, demonstrated through either precedent or constitutional entrenchment, moderates the relationship between property rights protection and economic growth (North and Weingast 1989). Countries that can provide economic actors with a credible commitment to protect property rights will benefit with increased economic performance. Countries that cannot provide such a commitment, on the other hand, are unlikely to experience any economic benefit from protecting property rights. Unfortunately, many developing countries fall into this latter group as a result of abysmal property rights protection in the recent past – El Salvador is one of these countries (Nugent and Robinson 2010).

The implications of this argument are threefold. First, many developing countries are unlikely to experience any improvement in economic performance from reforms aimed at increasing the protection of property rights, at least until such reforms are deemed credible. This is a troubling prospect that may jeopardize developing countries' commitments to such reforms. Second, since current political leaders can potentially influence the content of the constitution but not precedent, the extent to which each of these credibility mechanisms moderates the relationship between property rights and economic growth is indicative of current political leaders' abilities to affect both the credibility of their countries' commitments to property rights protection and, hence, the likelihood of successfully improving property rights protection in their countries. Third, since unstable levels of property rights protection

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in the present will hurt the credibility of countries' future commitments, failed property rights reforms will reduce the likelihood that future reform attempts will be successful. The remainder of the manuscript develops this argument and tests it using cross-national data from more than 100 countries from 1985-2005.

Credibility, Property Rights, and Economic Growth

Property rights allow resources that would otherwise be directed toward securing one's property, rent-seeking, or other inefficient activities to be invested in capital and the development of new technologies (North and Thomas 1973; North 1990). Thus, where property rights are protected, investment should be higher, which ultimately leads to faster economic growth through capital growth and technological progress. For the expected relationship between property rights and economic growth to exist, however, it is critical that economic actors be willing to divert resources away from securing their property toward investments that have no immediate return. Assuming economic actors are rational, if they do not view the commitment to property rights made by political leaders as credible for the foreseeable future, then they will not invest because the risk of losing either their current property or the returns on their investments will outweigh the potential benefits of making such investments (North and Weingast 1989). Consequently, in order for countries to realize the economic benefits of property rights protection, they need not only to commit to the protection of property rights but to *credibly commit*.

The evidence supporting this theory is significant. For example, North and Weingast's (1989) seminal work finds that the existence of property rights in England were unable to spur capital growth until the commitment to their protection was credible, after the Glorious Revolution and the development of parliamentary supremacy. Other works by North contain similar findings using different cases (for examples, see North 1994). A number of studies also assess the relationship between credibility, property rights, and economic performance using more recent economic and political transitions, such as those that took place in Russia after

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the end of the Cold War (Shleifer and Treisman 2000; Frye 2004). In general, the results of these studies are similar to those of North: a credible commitment to property rights protection is necessary for such protection to lead to improved economic performance.

In general, there is little debate in the literature about the relationship between property rights and economic growth. Indeed, "[t]here seems to be a broad consensus...that secure property rights are crucial for economic growth" (de Haan, Lundstrom and Sturm 2006, 169). Nor do I believe that many would argue with the presumption that a credible commitment to the protection of property rights is critical for this relationship to exist. Nonetheless, cross-national empirical work assessing whether or not credibility moderates the relationship between countries' commitments to property rights protection and economic growth is virtually non-existent.

The Observed Effect of Property Rights

Most empirical studies ignore the importance of credibility and focus solely on the independent effect that property rights protection has on economic growth (see, for example, Barro 1996; Lane and Tornell 1996; Knack and Keefer 1995; Keefer and Knack 1997; Clague et al. 1996; Kereks and Williamson 2008). These studies typically use cross-sectional data to employ a modified, often reduced-form, Solow growth model that includes some measure indicating the level of property rights protection (e.g. the BERI or ICRG risk indicators or something similar). Virtually all such studies find that property rights effect economic growth (Aron 2000). Although seemingly robust, the findings in these studies are most likely biased due to their omission of any indicator of the credibility of countries' commitments to property rights. At the very least, these studies lead to the false expectation that present commitments to protect property rights are sufficient for faster economic growth, when (at least theoretically) this relationship is moderated by the credibility of that commitment.

A few studies assess the effects of both countries' commitments to property rights and the credibility of those commitments. These studies typically explore the independent effect that credibility has on economic growth while controlling for property rights protection.

For instance, Brunetti, Kisunko, and Weder (1998) use a survey of local entrepreneurs to measure credibility of government policies and find that credibility effects both investment and economic growth. Both Gwartney, Lawson, and Holcombe (1999) and Pitlik (2002) report similar findings when assessing the effect of economic freedom, which is highly correlated with property rights protection, on economic growth. The models estimated in these studies assume that, regardless the level of property rights protection, credibility affects economic growth. Based on the theory elaborated above, though, a commitment to property rights and the credibility of that commitment are both necessary for faster economic growth. Therefore, even studies that include credibility and the level of property rights protection in the same empirical model may suffer from omitted variable bias, because they omit an interaction between these two variables.

Based on this brief review of the literature, it would seem that previous cross-national empirical work on the relationship between property rights and economic growth has taken the moderating effect of credibility for granted. However, there are at least two possible counter claims to this assertion. The first is that the work of North and his successors is sufficient to demonstrate the importance of credibility. In other words, large-n, cross-national analyses demonstrating that credibility moderates the effect of property rights on economic growth are unnecessary given the work of North. Although I agree that the work of North and his predecessors has been pivotal in demonstrating the importance of both property rights and credibility, supplementing the findings from this work with large-n, cross-national analyses is important for at least a couple of reasons. Much of this work tends to focus on Western European economic and political development, which took place centuries ago, or the economic and political transitions that took place in the Post-Communist countries after the end of the Cold War. As a result, critics might argue that the cases typically looked at in the economic history literature are unique, making the findings of this literature not applicable in other contexts. At the very least, these historical case studies provide little information to policy makers who wish to understand the expected impact of property rights

reforms, because they fail to account for a variety of covariates that might make the observed relationship weaker, or spurious. Furthermore, since existing cross-national analyses tend to ignore the impact of credibility and might lead to false expectations, estimating similar models that account for credibility is doubly important. Thus, cross-national analyses using current data will demonstrate the external validity of the economic history literature on property rights protection and provide valuable information about the expected effect of property rights reforms to leaders who wish to undertake such reforms.

Second, some might argue that certain measures of property rights (e.g. Clague et al.'s (1996; 1999) measure of contract intensive money or the instrumental variables – settler mortality and pre-colonial population – used by Acemoglu et al. (2001)) implicitly incorporate the moderating effect of credibility, making an explicit measure of credibility unnecessary. This may be true if one is mostly interested in explaining long-term differences in economic performance *between* countries. Explicitly incorporating credibility into empirical models becomes important, however, when evaluating whether or not and how countries should implement property rights reforms. In this scenario, we are interested in variance in economic performance *within* countries as the level of property rights protection changes. Credibility is arguably more important in this scenario, as we are assessing the effect of changes in property rights protection over time. Moreover, studies without explicit measures of credibility potentially hide heterogeneity in the effect of property rights on economic performance. Hiding this heterogeneity may establish unrealistic expectations in countries that reform their protection of property rights. Modeling this heterogeneity, on the other hand, may reveal mechanisms that political leaders can use to guarantee economic actors that their commitment to property rights reforms are credible. In short, studies that do not explicitly model the moderating effect of credibility provide little information about the impact that reforming property rights protection will have on countries' economic performance.

Mechanisms of Guaranteeing Credibility

When measuring credibility, existing cross-national studies typically assume (at least implicitly) that credibility is only a function of precedent. In other words, credibility is operationalized in a way that suggests actors will only consider a countries' commitment to property rights credible if that commitment has been honored for some long, unspecified period of time. This assumption is most prevalent in the work of Pitlik (2002), who operationalizes credibility as volatility over time. Similarly, the survey questions used to measure credibility by Brunetti, Kisunko, and Weder (1998) ask about local entrepreneurs' expectations about the credibility of government's policies. Although one cannot be certain, such expectations are probably the result of stability (or instability) of government institutions over time. Even in the work of North, who explicitly argues that institutional rules provide credibility (North and Weingast 1989), it is often difficult to distinguish whether credibility is actually the result of institutional rules or a precedent that developed over the time span of the inquiry, which is often decades.

Based on these studies, then, one might get the impression that the only method of credibly committing to property rights protection is a history of such protection. However, leaders have at least two mechanisms at their disposal to establish the credibility of their commitments. "One is by setting a precedent of 'responsible behavior,'...The second is by being constrained to obey a set of rules that do not permit leeway for violating commitments" (North and Weingast 1989, 804). I do not mean to discount the importance of precedent. A history of property rights protection is certainly an indicator, if not the best indicator, of credibility. Still, the view that precedent alone leads to credibility is overly deterministic, and since most countries, especially in the developing world, do not have a strong precedent for protecting property rights, they are left with no alternative but to wait years for their commitment to property rights protection to become credible.

Fortunately, leaders have another, rarely explored option: adopt institutions that constrain themselves and future leaders to respecting the protection of property rights.

Institutional constraint is a potentially powerful tool through which leaders can greatly reduce the period of time necessary for their country to realize the benefits of improving property rights protection. They simply (or maybe not so simply) need to adopt measures that protect property rights in a way that constrains both themselves and future leaders from violating those measures. Here, I explore one mechanism through which leaders may be able achieve such constraint: constitutional entrenchment.

Constitutions as Commitment Devices

Theoretically, constitutional entrenchment is one means leaders can use to demonstrate the credibility of their commitments. An important, if not the most important, function of constitutions is to establish a set of inviolable principals and provisions to which future law and government activity must conform (Finer 1988; Breslin 2009). Thus, entrenching property rights in the constitution moves them from the realm of normal politics to the realm of higher law (i.e. property rights become part of the rules of the game instead of something developed within those rules). Establishing property rights as higher law is more credible than merely adopting legislation to protect property rights because it effectively removes property rights protection from the political debate and also makes violations of property rights easier to identify and more costly (Elkins, Ginsburg and Melton 2009).

Of course, constitutional entrenchment is only credible if government officials are actually constrained by the constitution. However, many would argue that constitutions are not an effective constraint. In the words of James Madison, "[a] mere demarcation on parchment of the constitutional limits...is not a sufficient guard against those encroachments which lead to a tyrannical concentration of all the powers of government in the same hands" (Madison, Hamilton and Jay 1826, Federalist #48). The view set forth by Madison that constitutions are merely parchment barriers is common. Solely looking at the economic growth literature, a number of scholars make claims about the importance of *de facto* over *de jure* variables. Take, for instance, Klitgaard and Berggren's claim that "...what is important is not the formal enumeration of de jure rights..., but the de facto protection of rights..." (2002, 187).

Similarly, in Aron's review of the literature, she finds that "...the appropriate institutional variables to include in...growth regressions are those that capture the *performance* or *quality* [emphasis in the original] of formal and informal institutions rather than merely describe the characteristics or attributes of political institutions and society..." (2000, 128). Such views are hardly surprising considering that studies which assess the effect *de jure* variables on economic growth find that the *de jure* variables have no statistically significant effect (Vanssay and Spindler 1994; Feld and Voigt 2003).[2]

The persistence of the view that constitutions are merely parchment barriers might lead one to expect both constitutions and scholarship on constitutions to be rare. However, neither of these expectations is met. Constitutions are prevalent throughout the world. As of this writing, with the exception of the United Kingdom (whose constitution is unwritten), every independent state in the world has a written constitution (Elkins, Ginsburg and Melton 2009). Furthermore, in recent years, there has been a tendency for scholars to take constitutions more seriously as well. Unlike early writings on constitutions that focused solely on normative arguments, this new, so-called constitutional economics, literature takes a positive approach to studying both the effects and the emergence of constitutional rules (for a review of this literature, see Voigt 2009). The significant resources expended by elites in the writing and promulgation of constitutions and by academics in studying these documents indicate that there are at least some who view the limits placed on government by the constitution as effective.

Even if constitutions are merely parchment barriers, though, they still might represent a better signal of credibility than ordinary legislation because of the difficulty involved in altering the constitution. Both amendment and replacement of the constitution typically require the approval of a supermajority, whereas legislation can be overturned by a mere majority (Lutz 1994). As a result, even if the constitution does not place any effective

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[2]Although, there is some evidence that *de jure* judicial independence affects *de facto* judicial independence (Hayo and Voigt 2007)

limits on government, constitutional entrenchment may still be seen as a signal of credibility in at least two respects. First, entrenchment suggests that a supermajority favored more secure property rights when they were entrenched in the constitution. Given such strong initial support and common knowledge of this strong initial support, enforcement of property rights should be more likely, which, in turn, should make attempted violations less likely (Weingast 2005). Second, a supermajority will also be necessary to remove property rights from the constitution. Not only is this a high hurdle, but given the strong initial support necessary to entrench property rights, finding a supermajority to remove them is likely to be difficult. Unlike protection through regular legislation, then, constitutional entrenchment signals to economic actors that there is strong support for the protection of property rights and, even if that support wanes over time, future leaders may still find it difficult to remove the entrenched protection. Despite this support, future leaders could still opt simply to ignore the constitution, either completely disregarding its provisions or using an illegitimate procedure to amend or replace. However, since such actions are both extremely costly and politically risky (Elkins, Ginsburg and Melton 2009), they are often undesirable and may even be unfeasible.

Of course, the need for the constitution to guarantee credibility may vary. Many developed countries have maintained a commitment to secure property rights for generations. As a result, even though constitutional limits on government may have been important for initially guaranteeing credibility in developed countries (North and Weingast 1989), many of these countries can now rely on precedent. Hence, one might not expect *de jure* property rights protection to affect the relationship between property rights and economic growth in developed countries. Similarly, once precedent is established in a developing nation, entrenchment may not be necessary for a relationship between property rights and economic growth to exist.

Summary

Few scholars would argue against the notion that long-term economic growth will be faster in countries that maintain credible commitments to the protection of property rights. Nevertheless, few cross-national empirical studies test if credibility affects economic growth, and those that do fail to model credibility as a moderating variable and tend to use an overly deterministic view of credibility. This leaves leaders wishing to increase the level of property rights protection in their country with insufficient knowledge about both the implications of such reforms and about the steps they can take to ensure that their commitments to such reforms are viewed as credible. To fill this gap in the literature, I assess the moderating effect of credibility on the relationship between property rights and economic growth below. Specifically, I test three hypotheses:

1. Property rights protection will cause faster economic growth only in those countries with a precedent for protecting property rights.

2. Property rights protection will cause faster economic growth only in those countries with *de jure* property rights protection.

3. The effect of *de jure* property rights will only be present in countries lacking a precedent.

Research Design

Following previous studies that quantitatively analyze the effect of property rights on economic growth, I test the hypotheses using the following OLS regression model:[3]

$$\Delta Y_{it} = \alpha \boldsymbol{M}_{it} + \beta \boldsymbol{P}_{it} + e_{it} \tag{1}$$

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[3]This equation varies slightly from the traditional one used in the growth literature in that it omits the Z_{it} term, which is a set of three (or more) additional explanatory variables that are used to perform extreme bounds analysis (EBA). Since it is not clear how to apply EBA when interaction terms are included in $\boldsymbol{P}_{it}$, no EBA is performed and this term is omitted.

where ΔY_{it} is the average real per capita GDP growth of country i in time period t, $\boldsymbol{M}_{it}$ is a vector of explanatory variables that have been shown to have a robust effect on economic growth in previous studies, $\boldsymbol{P}_{it}$ is a vector of the explanatory variables of interest in the present study, and e_{it} is an error term. $\boldsymbol{P}_{it}$ will consist of an interaction between the level of *de facto* property rights protection and at least one of the credibility measures, including all the required constituent terms (Brambor, Clark and Golder 2006), but the precise variables in $\boldsymbol{P}_{it}$ will depend on the hypothesis being tested. Four five-year time periods (t) are used in the analysis - 1985-1990, 1990-1995, 1995-2000, and 2000-2005. Although the economic data are available for most countries in the world during each of these time periods, the property rights data are not. As a result, the number of countries (i) used in the analysis ranges from 45 to 103, depending on the time period, for a total of only 276 possible observations. The rest of this section describes how each of the variables in equation 1 is operationalized.

Economic Growth

The dependent variable for all analyses is real per capita GDP growth averaged over some period. Data for this variable are from the Penn World Tables (Heston, Summers and Aten 2009). The periods are all 5 years in length and are measured starting in the year after the time period of the observation begins. Put more concretely, if the period is 1985-1990, economic growth is averaged over the years 1986-1990.

The Level of *De Facto* Property Rights

De facto property rights protection is measured with the 2009 version of the *Economic Freedom in the World* index produced by the Fraser Institute (Gwartney 2009). Only the "legal structure and security of property rights" area of this index is used in the analysis. In previous studies, this area has been shown to have a robust effect on long-term economic growth (Dawson 2003; Carlsson and Lundstrom 2002; Berggren and Jordahl 2005). The Fraser Institute measure of property rights protection ranges from 0-10 (in increments of 0.1) and provides estimates of property rights protection for between 48 and 139 countries for

the years 1970, 1975, 1980, 1985, 1990, 1995, and 2000-2007.[4] To avoid endogeneity issues, the level of property rights protection is only assessed in the first year of every period being analyzed (i.e. 1985 if the time period is 1985-1990).

This measure is chosen primarily for the time span it covers. To my knowledge, it is the only measure to provide estimates of property rights protection for such a large group of countries back to 1970. As noted below, a large number of time periods are critical when measuring precedent. Moreover, since the analyses below rely heavily on interaction terms, a broad range of countries and time periods is desirable to ensure that all possible combinations of the interacted variables are present in the data. Other measures of *de facto* property rights protection lack these desirable characteristics, making them inappropriate for the present paper.

Credibility

Two measures of credibility are used. The first is a measure of precedent and the second a measure of *de jure* property rights protection.

Precedent

The measure of precedent is based on Pitlik's (2002) measure of volatility:

$$Precedent_{it} = 1 - \sqrt{\frac{1}{T}\sum_{t=1}^{T}\left(\Delta PR_{it} - \frac{1}{T}\sum_{t=1}^{T}\Delta PR_{it}\right)^2} \tag{2}$$

where PR_{it} is the change in property rights protection in country i over period t, which ranges from t to $t-5$, and T is the number of periods. By this measure, countries that experience no change in property rights protection will receive a score of 1, and countries that experience a change in protection will receive a score less than one. Hence, higher scores indicate more precedent. This measure is better than simply taking the change in property rights protection or the standard deviation of the level of property rights over time, because

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[4]*De facto* property rights protection is rescaled to range from 0-1 to make the index more comparable with its *de jure* counterpart.

it penalizes countries for uncertainty in their level of property rights protection that is caused by abrupt *and* frequent shifts in protection over time (Pitlik 2002).[5]

For the advantages of this measure to materialize, however, T must be greater than or equal to three. Setting T too high may be a problem too. Since the precedent measure weights changes across all time periods equally, recent institutional instability has the same influence on the measure as historical instability, even though recent institutional instability should have a larger effect on credibility than institutional instability that occurred 20 or 30 years prior. A large T also has the disadvantage of reducing the number of time periods for which precedent can be calculated, because the *de facto* property rights data are limited in time span. To balance all of these considerations, three time periods are used when calculating precedent, regardless of the period under observation. Hence, the first time period for which precedent can be calculated is 1985, which uses changes in *de facto* property rights from 1970, 1975, and 1980 to calculate precedent. The resulting measure has a mean of 0.87, a standard deviation of 0.09, and ranges from 0.25 to 0.99.

De Jure *Property Rights Protection*

There are no previously existing indices of *de jure* property rights protection, so I constructed one using data from the *Comparative Constitutions Project* (CCP).[6] According to Miller, property rights refer to the "ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state" (2009, 449). Based on this definition, the protection of property rights breaks down roughly into the presence of laws that protect

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[5]Although this measure of precedent can be safely interpreted as a measure of institutional stability, it should not be interpreted as indicating political, or regime, stability. Stability in property rights protection is certainly correlated with political stability, but the protection of property rights protection may be stable, or not, both within and across regimes.

[6]The CCP has data on the content of formal constitutions for all countries in the world from 1789 to the present. More information about the project is available at http://www.comparativeconstitutionsproject.org.

individuals' property and the enforcement of those laws by an impartial, independent judiciary. Thus, the measure of *de jure* property rights discussed below has three subcomponents, one for each dimension of the definition - protection of property rights (nine questions), judicial independence (twelve questions), and fair and efficient adjudication of disputes (six questions).[7] Notably, these are the same subcomponents used in Gwartney's (2009) measure of property rights protection, the *de facto* measure used here.[8] The *de jure* property rights variable is created by rescaling each subcomponent to range from 0 to 1 and then averaging the three components, which yields a measure that can range from 0 (no protection) to 1 (full protection). When calculated, the measure has a mean of 0.49, a standard deviation of 0.17, and ranges from 0.09 to 1.00.

Since the subcomponents of the *de jure* and *de facto* measures of property rights protection used here are the same, one might expect a high correlation between these measures. Not unlike other recent works that analyze the relationship between the *de facto* and *de jure* constitutions (Elkins, Ginsburg and Melton 2009; Hayo and Voigt 2007), however, the relationship between *de facto* and *de jure* property rights is actually quite weak, with r ranging from -0.28 to -0.13. Somewhat unexpectedly, however, the relationship is negative. Despite this weak, negative correlation, there is a lot of variance between countries in the relationship between their *de facto* and *de jure* property rights protection. Some countries promise more property rights than exist in the country, other countries have far more real property rights

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[7]The list of questions from the *Comparative Constitution Project's* survey instrument used to create each subcomponent and the coding rules used for each question are available in the supplementary materials.

[8]Although one might argue that the legal protection of property rights subcomponent of the *de jure* measure of property rights protection is the only subcomponent that should be used in the *de jure* measure, this is not possible without creating a mismatch between the *de jure* and *de facto* measures, because subcomponents of the *de facto* measure are unavailable prior to 2000.

than what is enumerated in their constitution, and still other countries exhibit a fairly strong relationship between the level of *de facto* and *de jure* property rights protection.

Additional Explanatory Variables

Only the three variables that Solow's neoclassical growth model posits to affect economic growth are included in the $\boldsymbol{M}_{it}$ vector of equation 1: investment, human capital, and real GDP per capita. Both real GDP per capita in the base year of each period and the investment share of GDP averaged over the periods in which economic growth is measured are from the Penn World Tables (Heston, Summers and Aten 2009). Human capital is operationalized as the average educational attainment among 25 year olds, using data from the Cline Center for Democracy (Nardulli 2010).[9] In addition to these "typical" variables, several additional variables are included when testing the robustness of the results. These include all of the variables used in the extreme bounds analysis performed by de Haan and Sturm (2000): the population growth rate, the ratio of real government consumption to GDP, the inflation rate, and the ratio of exports and imports to GDP. The data for these variables are from the Penn World Tables (Heston, Summers and Aten 2009). Each is operationalized as the average over the period which economic growth is measured. I also assess the robustness of the model to countries' levels of democracy, since democracies are associated with both higher economic growth and better property rights protection, and levels of corruption, since corruption is associated with slower growth and may also be associated with worse property rights protection. Regime-type is operationalized using the Unified Democracy Scores (UDS) (Pemstein, Meserve and Melton 2010), and corruption is operationalized using the corruption variable from the *International Country Risk Guide* (The PRS Group 2005). Both the level of democracy and level of corruption are measured during the base year of each period (i.e.

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[9]Traditionally, data from Barro and Lee (2001) are used to measure human capital. The problem with the Barro and Lee data are their more limited coverage. For instance, in 2000, the Cline Center data spans 158 countries, while the Barro and Lee data spans 104 countries. In the years when data are available for both measures, they correlate very highly (r = 0.98).

1985 is used for the 1985-1990 period). Lastly, year fixed-effects are used in all models to account for global economic shocks, and since the primary interest in this paper is within country effects, every model is estimated with country fixed-effects.[10]

Data Analysis

Table 1 provides the coefficient estimates from a series of the fixed-effects regression models, with clustered, robust standard errors in parentheses.[11] For each model specification, the model is estimated using all observations and, since we are ultimately interested in how property rights reforms affect developing countries, only observations from lesser developed countries (LDCs), as indicated by their score on the Human Development Index (HDI) (World Bank 2000).[12] Model 1 includes only the vector of variables denoted by $\boldsymbol{M}_{it}$ in equation 1. Both GDP and investment are statistically significant and in the expected direction. The model indicates that every \$1,000 increase in GDP per capita decreases economic growth by 0.33 points (or 1.05 points in LDCs), and every percentage point increase in investment increases economic growth by about 0.20 points. The effect of GDP is fairly robust across the 10 models in Table 1. Investment, on the other hand, becomes statistically insignificant in LDCs once the property rights variables are included in the model. The other

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[10]Aside from the theoretical rationale for using fixed effects, a Hausman test confirms that fixed effects is preferred to random effect to account for heterogeneity across countries.

[11]Two tests were performed to test for heteroskedasticity. The probability of the null hypothesis of no heteroskedasticity using White's test was 0.006 ($X^2 = 57.97$, d.f. $= 34$), and the probability of the same null hypothesis using the Breusch-Pagan test was 0.123 ($X^2 = 11.36$, d.f. $= 7$). Since these tests indicate there may be heteroskedasticity present, all models are estimated with robust standard errors, clustered on the country.

[12]Countries are coded as being a LDC if their HDI is less than 0.85 at the start of the period being analyzed. This is slightly lower than the 0.90 value used by the World Bank to indicate LDC status to ensure that all countries with HDI scores higher than 0.9 in 2000 are coded as developed during all periods under analysis.

variable in model 1 is human capital, which is always statistically insignificant and even has the wrong sign in the models that include all of the observations.[13] Although higher levels of human capital are widely believed to cause economic growth (Aron 2000), other studies that use educational attainment as a proxy for human capital also find a weak relationship between it and economic growth (e.g. Hayo and Voigt 2007). This could be the result of measurement error resulting from using educational attainment as a proxy for human capital (Cohen and Soto 2007), or it could be caused by a lack of variation in human capital within countries over time (Durlauf, Johnson and Temple 2005).

Model 2 adds the level of *de facto* property rights protection as an explanatory variable. This variable is positive and statistically significant when all observations are used and when only observations from LDCs are used. The model indicates that a 0.1 unit shift in property rights protection (i.e. a movement of 1 unit on the original 10 unit scale) increases economic growth by 3-4 percentage points. This effect is similar to those found in much of the literature on the relationship between property rights and economic growth. However, since the moderating impact of credibility is not included in the model, the effect of *de facto* property rights protection estimated by model 2 may be biased.

Models 3-5 assess this possibility and test the three hypotheses specified above by including interactions between precedent, *de jure* property rights protection, or both of these variables and *de facto* property rights protection. Starting with hypothesis 1, model 3 assesses the moderating effect of precedent. It is important to note that neither the *de facto* property rights nor precedent variables can be interpreted directly in model 3, since the effect of each is conditioned on the other variable. Moreover, since a key piece of information is missing – the

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[13]Notably, the human capital variable tends to be the correct sign, and even becomes statistically significant in some model specifications, when the Barro and Lee (2001) measure of educational attainment is used. However, this appears to be due to the change in sample size, because the Cline Center measure of educational attainment reacts similarly when the sample is restricted that of the Barro and Lee measure.

covariance between these two variables, even the statistical significance denoted in Table 1 can be misleading (Brambor, Clark and Golder 2006). Figure 1 clarifies the effect of *de facto* property rights by plotting its marginal effect as precedent increases. The figure is based on the coefficient estimates from model 3 when only observations from LDCs are used.[14] In the figure, the solid line illustrates the estimated effect of the level of property rights on economic growth, and the dashed lines indicate the upper and lower bounds of the 95% confidence interval around that estimate. The figure demonstrates that the effect of property rights on economic growth increases as precedent increases and becomes statistically significant only after precedent is greater than 0.8. Based on the estimates from model 3, then, the level of property rights protection has no effect on economic growth for about 25% of the periods under observation. The remaining 75% of periods experience a stronger relationship between *de facto* property rights and economic growth the higher their level of precedent. The general relationship illustrated in Figure 1 is highly robust, a point I return to below.

The hypotheses related to *de jure* property rights are tested in the final two models. Model 4 solely assesses the moderating effect of *de jure* property rights, and Model 5 assesses if the moderating effect of *de jure* property rights is dependent on the level of precedent. Figures 2 and 3 illustrate the effects estimated by Models 4 and 5, respectively, when using only observations from LDCs. Looking first at Figure 2, there is a positive relationship between the marginal effect of *de facto* property rights on economic growth and *de jure* property rights protection, and the effect of *de facto* property rights is only statistically significant when *de jure* property rights ranges from about 0.4 to 0.8. Roughly 70% of the observations fall in this range.

Figure 3 assesses if the impact of *de jure* property rights is dependent on the level of precedent in a country. Recall that hypothesis three posits only countries without a precedent for property rights protection will benefit from constitutional entrenchment. Figure 3 provides

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[14]Figures based on models estimated using all of the observations look approximately the same as Figures 1, 2, and 3 and are available in the supplementary materials.

some evidence for this hypothesis. When precedent is highest (1.0) in the top left panel of Figure 3, the marginal effect of *de facto* property rights is estimated to actually decrease slightly as *de jure* property rights increases. At more moderate levels of precedent (0.90 and 0.80), there is a positive relationship between the marginal effect of *de facto* property rights and constitutional entrenchment of property rights that gets stronger as the level of precedent decreases. Furthermore, the level of *de jure* property rights where *de facto* property rights has a statistically significant effect on economic growth increases across the two panels, ranging from about 0.2 to 0.7 when precedent is at 0.9 and about 0.5 to 0.8 (or even 1.0 if 90% confidence intervals are used) when precedent is at 0.8. In the final panel of Figure 3, although there is a strong positive relationship exhibited, the relationship between the marginal effect of *de facto* property rights and *de jure* property rights is never statistically significant. Thus, when precedent is very low, even constitutional entrenchment is insufficient to stimulate a statistically significant relationship between *de facto* property rights and economic growth.

Robustness Checks

The estimates from Models 3, 4, and 5 in Table 1 provide at least some support for all three of the hypotheses specified above. In this section, I describe the results of a number of additional models estimated to assess the robustness of these results. These robustness tests and their results are discussed below with the full results available in the supplementary materials.

The first set of robustness checks involves the specification of the models in Table 1. Since the results from growth regressions tend to be model dependent and no variety of extreme bounds analysis (EBA) is used, I estimated each model with all of the additional variables that would traditionally be included in an extreme bounds analysis – government consumption, trade openness, population growth, and inflation.[15] In addition, since countries'

[15]A number of additional variables have also been suggested for use in EBA (Sturm and de Haan 2005), but many of these are irrelevant in the current analysis due

levels of democracy and corruption are potentially related to both property rights protection and economic growth, I also estimate each model including these variables as covariates. The results of Models 3, 4, and 5 are all substantively unchanged when these additional covariates are included, suggesting that the models presented in Table 1 are robust to alternate model specifications.

The second set of robustness checks assesses how changes in the sample affect the results. To be specific, I estimated the models omitting the period from 2000-2005, since the Fraser Institute measure of *de facto* property rights changed in 2000, and omitting observations indicated as influential by Cook's D. Model 3 seems unaffected by these changes in sample. Models 4 and 5, on the other hand, are unaffected by omitting influential observations, but when the 2000-2005 period is omitted, the marginal effect of *de facto* property rights is estimated either to decrease or to remain unchanged as *de jure* property rights increases, regardless of the level of precedent. Thus, the moderating effect of *de jure* property rights is not robust to omitting the 2000-20005 period from the analysis.

The third set of robustness checks changes the way several of the variables are operationalized to assess if the measurement of the dependent or the independent variables is driving the results. Specifically, I re-estimated the models using the traditional Barro and Lee measure of educational attainment, averaging the economic variables over 10 year increments, and using four periods to measure precedent. Notably, for each of these checks, the sample also changes, so in some sense, these checks assess both the operationalization of the variables and the sample. Once again, the estimates produced by Model 3 are substantively the same regardless of the operationalization of these variables. The models that include *de jure* property rights as a covariate did not perform as well. In fact, the relationship predicted by the hypotheses was only found in two of the ten models estimated using alternate operationalizations of the variables – Model 4 estimated using only observations from LDCs with the economic variables averaged over 10 year increments, and Model 5 estimated using

to the presence of country fixed-effects (e.g. region, religion, etc.).

all observations and the alternate measure of human capital. The moderating effect of *de jure* property rights is clearly not robust to alternate operationalizations of the independent and dependent variables. Although, it should be noted that some of these models severely stress the data, containing a small number of observations and, due to the country fixed-effects, a very large number of variables.

Lastly, I tested the possibility that the results might be driven by endogeneity. Although all of the property rights variables are measured prior to the period over which economic growth is measured, endogeneity might arise if the observed level of *de facto* property rights is caused by past economic growth. Furthermore, some of the coefficient estimates in Table 1 might be biased if their observed level is caused by another covariate in the model. For instance, if *de jure* property rights protection affects the level of *de facto* property rights protection or, maybe more likely, if *de facto* property rights affects investment, then the estimated effects of *de facto* property rights or investment might be biased. To rule out these possibilities, *de facto* property rights was regressed on *de jure* property rights, economic growth lagged one period, and all of the other economic covariates lagged one period with period and country fixed effects. Neither the *de jure* property rights nor the economic growth variables even came close to statistical significance. Similarly, investment was regressed on *de facto* property rights, precedent, the interaction between these two variables, and all of the economic covariates (excluding economic growth) with period and country fixed effects. The results of this regression indicate that, regardless of the level of precedent, *de facto* property rights do not have a statistically significant effect on investment. The results of these regression models are robust regardless of whether all of the observations or only observations from LDCs are used in the analysis, and they are similar to the results reported in previous studies (de Haan, Lundstrom and Sturm 2006). Since there is no evidence of endogeneity, it is unnecessary to estimate the equations from Table 1 using two-stage least squares.

To summarize, endogeneity does not seem to be biasing the estimates from Table 1. Furthermore, the moderating effect of precedent is very robust. In all of the alternative models

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estimated, *de facto* property rights only has a statistically significant effect on economic growth in countries where precedent is sufficiently high. Conversely, the moderating effect of *de jure* property rights is not robust. The estimates from Model 4 only support hypothesis 2 in seven of the fourteen specifications, and the estimates of Model 5 only support hypothesis 3 in ten of the sixteen specifications. Therefore, even though the regression analyses reveal substantial evidence that precedent guarantees credibility and moderates the relationship between property rights protection and economic growth, the evidence is more mixed regarding the moderating effect of constitutional entrenchment.

Discussion and Conclusions

Both theory and empirical evidence support the notion that variance in property rights protection, and other political institutions, is able to explain differences between countries' long-term economic performance. Although this evidence has been used to argue that property rights reforms should be used to improve economic performance (de Soto 2000; World Bank 2003), some are skeptical of such reforms, pointing to evidence that the effect of property rights on economic growth is heterogeneous across countries (Rodrik 2006). This paper has tried to reconcile these two views by investigating where property rights reforms can be expected to improve economic performance. Specifically, I have argued that the credibility of countries' committments to property rights protection, as indicated by precedent and constitutional entrenchment, moderates the effect of such commitments on economic growth. The empirical results strongly support this argument.

In particular, a precedent for property rights protection seems to be necessary for property rights protection to have any affect on economic growth. The empirical results suggest that a level of precedent around 0.8 or higher is required for property rights protection to affect economic growth. These results indicate that in roughly 25% of the observations property rights has no effect on economic growth. Substantively, the moderating effect of precedent is quite strong, as illustrated in Figure 4. When precedent is 1.0, as in Panel A, the

model predicts that countries with *de facto* property rights 0.63 and higher will experience positive GDP growth. The precise growth expected depends on the level of property rights protection, with expected growth between 0.1% and 4.1% when the level of property rights is 0.65 and between 2.0% and 10.4% when the level of property rights is 1.0. In other words, countries with a precedent of 1.0 that improve their level of property rights protection from 0.65 to 1.00 are expected to experience a 2-6 percentage point increase in economic growth. In countries with lower levels of precedent, on the other hand, as in Panels B and C, countries are not expected to have positive growth at any level of *de facto* property rights protection. Thus, they are not expected to benefit economically from improving property rights protection.

These numbers corroborate the comparison between Costa Rica and El Salvador in the introduction. Costa Rica has a strong history of protecting property rights (Nugent and Robinson 2010). In fact, according the measure of *de facto* property rights protection used here, Costa Rica has consistently had one of the highest, most stable levels of real property rights projection in Central America from 1980 to 2005. Its economic performance has been equally good, with average real economic growth between 1990 and 2005 of nearly 2.5% (Heston, Summers and Aten 2009), compared to a regional average of only 1.7%. El Salvador, on the other hand, historically has a poor record of property rights protection (Nugent and Robinson 2010), which is reflected in the the measure of *de facto* property rights protection used here. Even though El Salvador sharply increased protection in the wake of the Salvadoran Civil War between 1990 and 1995, GDP growth in El Salvador was very weak compared to Costa Rica, at roughly 0.5%. Although one can not definitively say that the poor economic performance of El Salvador is a result of its lack of precedent for property rights protection, the evidence here suggests that it was at least a contributing factor.

The finding that precedent moderates the relationship between property rights protection and economic growth has several implications. First, if countries have a poor record of property rights protection in the recent past, then they are unlikely to experience the economic benefits of such protection until a sufficient period of time passes for their com-

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mitment to property rights to be deemed credible by economic actors. If the success of such reforms depends upon countries quickly realizing their benefits, this suggests that property rights reforms are unlikely to be successful in countries that lack a precedent for protecting property rights. Second, failed property rights reforms are likely to hurt countries' credibility, which may hinder the ability of future leaders in those countries to improve property rights protection. In sum, pushing countries without a precedent for property rights protection to improve that protection is both unlikely to be successful and may hinder countries' ability to improve property rights protection in the future. Based on these results, then, it seems clear that universal recommendations for property rights reform (e.g. de Soto 2000; World Bank 2003) are unwarranted and may even be detrimental.

Still, establishing a credible commitment to protect property rights may be one method through which developing countries can improve their economic performance. After all, countries that make such a commitment seem to experience faster GDP growth. So how can countries without a precedent for protecting property rights establish a credible commitment to protect them? Here, I argue that constitutional entrenchment is one such mechanism. Using a new measure of *de jure* property rights protection, I find some support for this hypothesis. Although the results are not very robust, they suggest that constitutional entrenchment can provide sufficient credibility for *de facto* property rights protection to have an effect on economic growth with moderate levels of precedent – between about 0.75 and 0.95. However, constitutional entrenchment does not appear to guarantee credibility when precedent is weak – below 0.75, and substantively, the effect of entrenchment is relatively weak. As illustrated in Figure 4, when constitutional entrenchment increases between Panel B and Panel D, the effect of *de facto* property rights is stronger and GDP growth is no longer ever expected to be negative. Nonetheless, the effect is not strong enough to compensate fully for the lack of precedent, as growth is still never expected to be positive due to the large confidence interval around the prediction.

Even though the available data do not provide strong evidence that constitutional

entrenchment can guarantee credibility, it is premature to rule out this possibility entirely. After all, the *de facto* data available are quite limited. In fact, given the data constraints, the fact that we observe constitutional entrenchment to have any effect is at least grounds for further investigation. Moreover, the lack of robustness mostly seems to revolve around the sample used to make the estimates, which might lead one speculate that the effect of constitutional entrenchment is context-specific. There is some even anecdotal evidence that constitutional entrenchment may be able to guarantee credibility. Take Chile, for example, where property rights protection has been greatly improved over the past 30 years and, in recent years, has reached a level similar to that of El Salvador. The difference between Chile and El Salvador is that Chile entrenched the protection of property rights in their constitution and, possibly as a result, experienced GDP growth at a rate similar to that of Costa Rica over the past 15 years.

Nonetheless, based solely on the results in this paper, the only option available to countries seeking to improve economic performance through better protection of property rights is to wait until enough time passes for their commitment to property rights to be deemed as credible. These results make one wonder whether credibility is equally important for other institutions (e.g. judicial independence, the rule of law, and democracy) to cause faster economic growth. Additionally, they highlight the importance of identifying mechanisms through which countries can guarantee credibility. Perhaps future research can reveal such a mechanism by either finding additional support for the constitutional entrenchment argument posed here or finding evidence for alternative mechanisms of guaranteeing credibility. For the former, scholars might look at specific contexts in which constitutional entrenchment is more likely to be deemed credible. For instance, one might argue that constitutional entrenchment is more credible in democracies. Since governance in democracies is more transparent (Svolik 2006), constitutional enforcement will be more likely in democratic regimes, making the constitutional limits less likely to be violated (Weingast 2005). This theory is corroborated by evidence that constitutions are more effective at limiting government in democratic regimes

(Brown 2001).

For alternative mechanisms of guaranteeing credibility, there are several possibilities that could be explored in future research. The first is international treaties. There is evidence that leaders sign international treaties to bind themselves and future leaders to politically unpopular reforms (Fernandez and Portes 1998; Baccini and Urpelainen 2010). Thus, by signing international agreements that require property rights protection, countries may be able to guarantee the credibility of property rights reforms. Similarly, separation of powers may make it harder for countries to renege on their commitment to property rights. Although North and Weingast (North and Weingast 1989) find historical evidence of this effect, I know of no studies that assess it using more recent, cross-national data.

Until constitutional entrenchment or one of these alternative mechanisms of credibility can be shown to guarantee credibility in the short-term, developing countries with poor property rights protection and without a precedent for protecting property rights face an unhappy dilemma. They can continue not to protect property rights, even though it is widely believed that such protection will lead to better economic performance. Conversely, they can improve their protection of property rights and hope the reform is sustained long enough to reap the economic rewards of such protection. If not, then not only were the initial reforms pointless, but they have potentially hurt their chances of successfully implementing future reforms.

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Table 1: Regression Analysis

| Variables	Model 1 All	Model 1 LDCs	Model 2 All	Model 2 LDCs	Model 3 All	Model 3 LDCs	Model 4 All	Model 4 LDCs	Model 5 All	Model 5 LDCs
De Facto P.R.			3.03**	4.23***	-13.93*	-32.91*	3.51	1.31	-22.45	-46.80
			(1.26)	(1.45)	(7.93)	(18.04)	(3.29)	(4.31)	(24.30)	(45.73)
P.R. Precedent					-14.71**	-17.21			-13.74	-14.22
					(7.36)	(11.23)			(20.47)	(26.41)
D.F. x Precedent					20.06**	45.33**			28.38	58.68
					(9.46)	(21.94)			(27.99)	(54.03)
De Jure P.R.							-1.82	-4.23	-7.49	-3.65
							(4.74)	(4.86)	(31.15)	(38.82)
D.F. x D.J.							-1.19	5.60	27.02	37.10
							(6.51)	(8.05)	(44.97)	(89.74)
D.J. x Precedent									4.87	1.10
									(37.15)	(45.66)
D.F. x D.J. x Precedent									-28.84	-38.87
									(52.10)	(107.83)
GDP (in PPP $1,000's)	-0.33***	-1.05***	-0.34***	-1.07***	-0.35***	-1.12***	-0.36***	-1.08***	-0.36***	-1.13***
	(0.08)	(0.17)	(0.08)	(0.17)	(0.08)	(0.16)	(0.09)	(0.18)	(0.09)	(0.16)
Human Capital	-0.34	0.76	-0.31	0.76	-0.15	0.81	-0.34	0.71	-0.11	0.85
	(0.44)	(0.55)	(0.43)	(0.54)	(0.42)	(0.54)	(0.44)	(0.64)	(0.45)	(0.59)
Investment	0.20***	0.20*	0.19***	0.16	0.20***	0.13	0.19***	0.17	0.21***	0.14
	(0.07)	(0.12)	(0.07)	(0.12)	(0.07)	(0.11)	(0.07)	(0.12)	(0.07)	(0.11)
R^2 (within Countries)	0.26	0.38	0.28	0.42	0.30	0.45	0.28	0.43	0.31	0.46
Countries	103	68	103	68	103	68	103	68	103	68
Observations	276	155	276	155	276	155	276	155	276	155

Notes: The table displays coefficient estimates from 10 fixed-effects regression models with clustered, robust standard errors in parentheses. The constant as well as binary variables for country and year are omitted from the table. Statistical significance is denoted as follows: $\Pr(t=0)<0.01=$***, $\Pr(t=0)<0.05=$**, $\Pr(t=0)<0.1=$*.

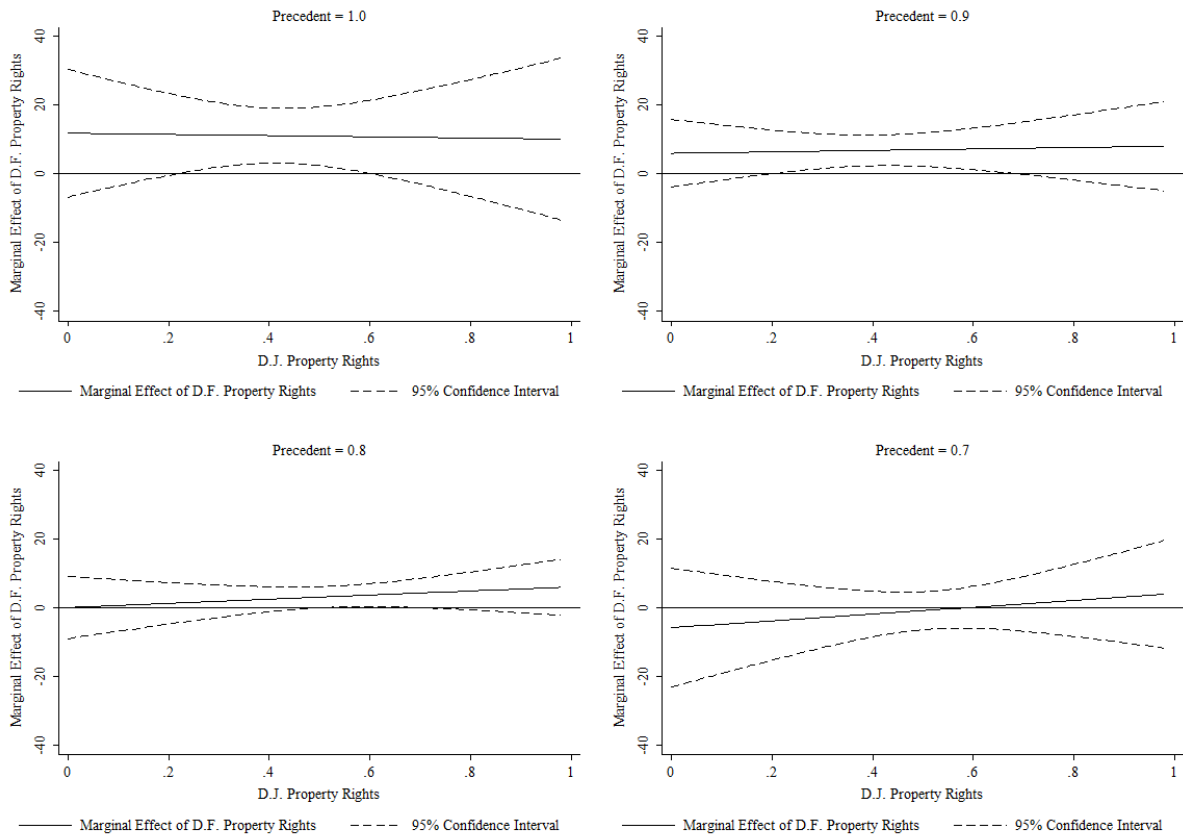Figure 1: Effect of *De Facto* Property Rights by Precedent
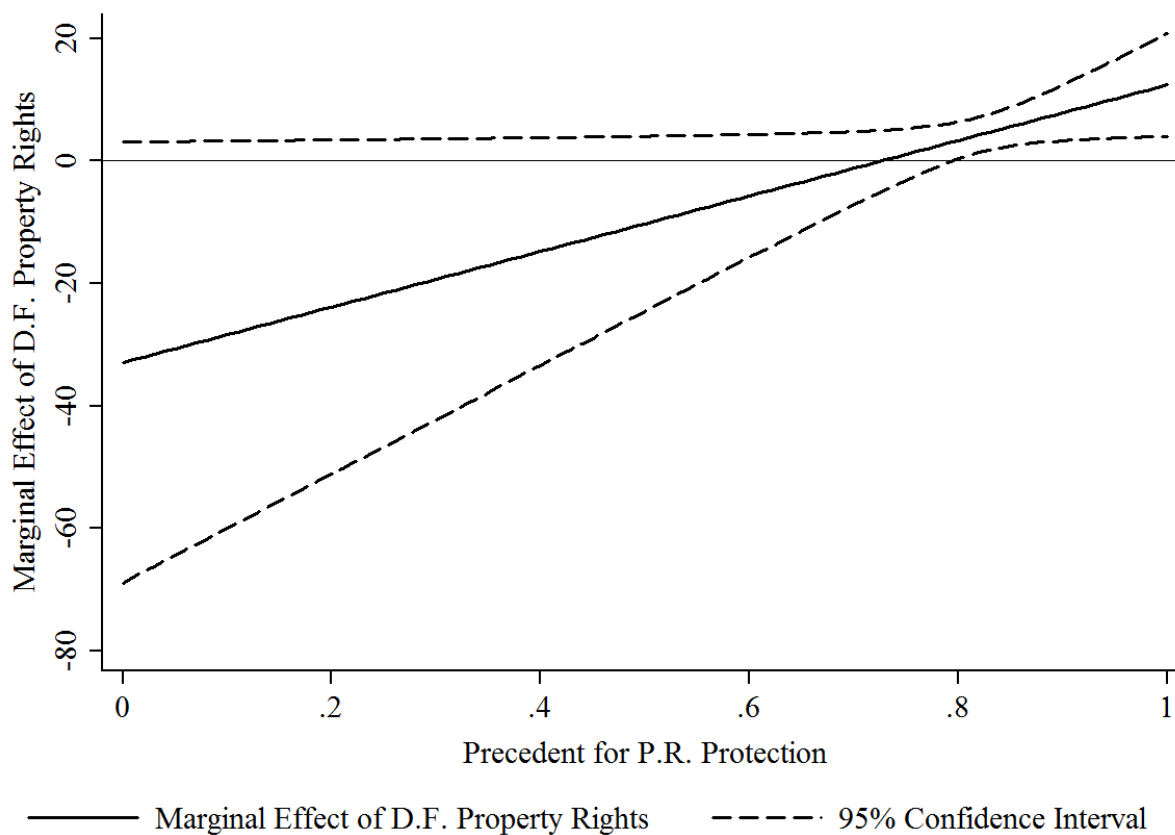
Notes: The lines depicted in this figure are based on coefficient estimates from Table 1, Model 3 estimated using only observations from LDCs.

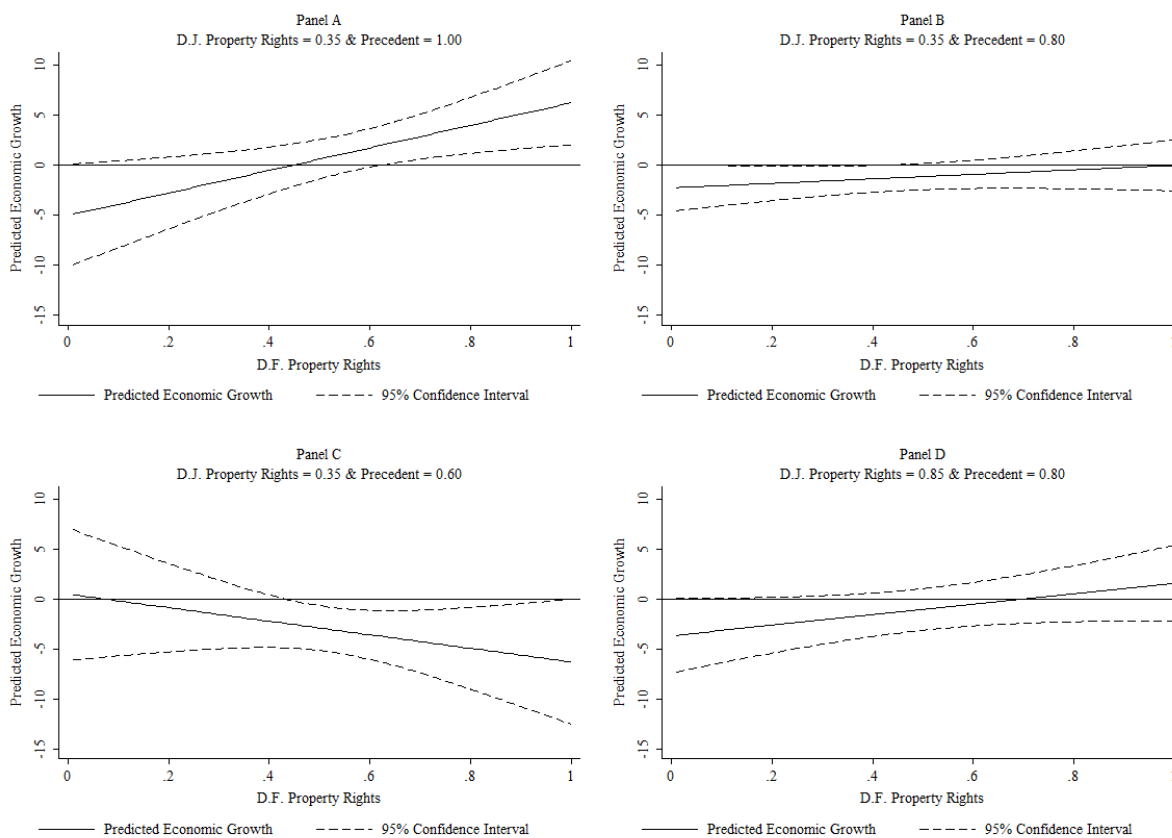Figure 2: Effect of *De Facto* Property Rights by *De Jure* Property Rights
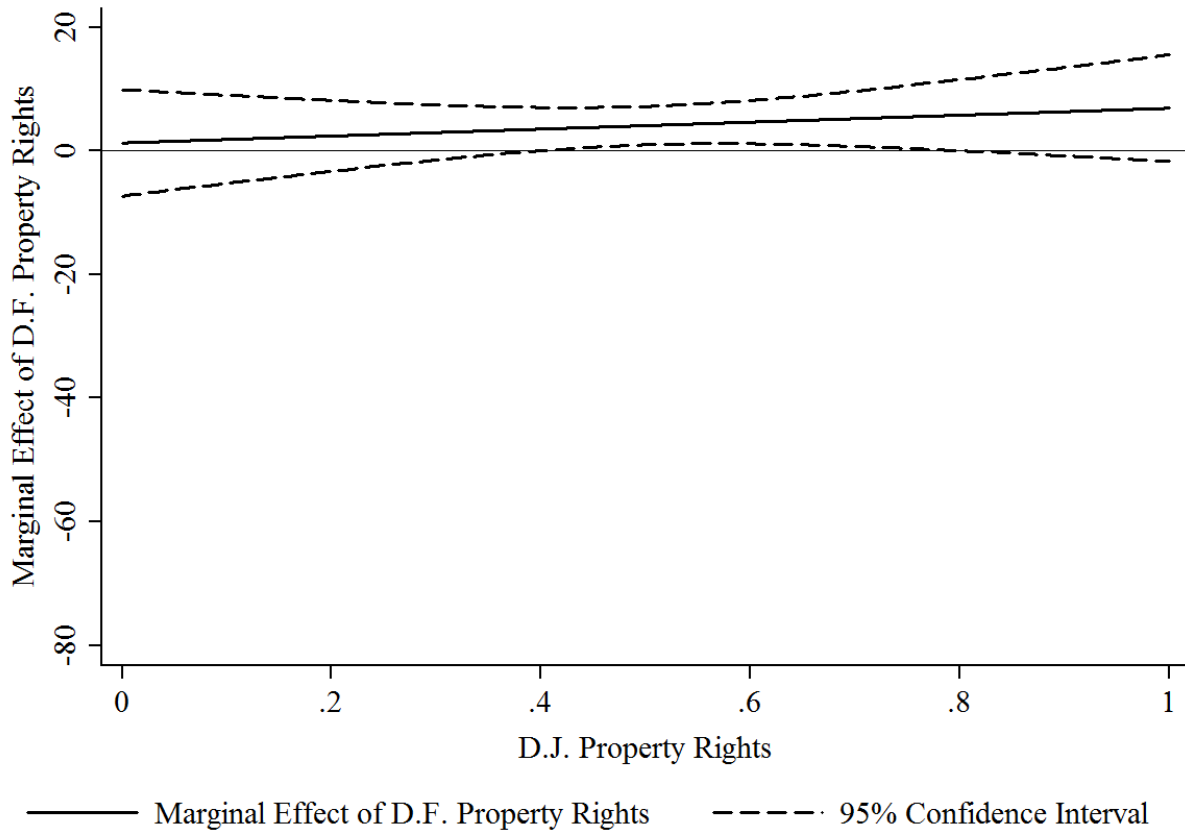
Notes: The lines depicted in this figure are based on coefficient estimates from Table 1, model 4 estimated using only observations from LDCs.

Figure 3: Effect of *De Facto* Property Rights by *De Jure* Property Rights and Precedent

Notes: The lines depicted in this figure are based on coefficient estimates from Table 1, model 5 estimated using only observations from LDCs.

Figure 4: Predicted Economic Growth by De Facto Property Rights

Notes: The predictions made in this figure are based on coefficient estimates from Table 1, Model 5 estimated using only observations from LDCs. The property rights variables are set at the values noted in the figure with all other variables set at their overall mean.