Security of Property Rights for Whom?

Terra Lawson-Remer
The New School, New York

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ABSTRACT

Although protecting the entitlements of some requires preventing others from claiming and controlling those same resources, much recent research regarding property rights and economic development treats the level of property rights security in a country as homogeneous. Widely used cross-national indices of institutional quality—initially designed to assess the property security of foreign investors—fail to consider marginalized groups. Using a new indicator that measures the property insecurity of ethno-cultural minorities, this article finds significant variation in the risk of expropriation faced by different groups in the same country. Findings also show that although secure property rights for elites may be positively related to development, aggregate long-run growth occurs in the presence of significant property insecurity for marginalized minorities.

Terra Lawson-Remer
Graduate Program in International Affairs
The New School
lawsonrt@newschool.edu
www.gpia.info

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Terra Lawson-Remer
The New School
Graduate Program in International Affairs
lawsonrt@newschool.edu

1 Introduction

Protecting the property rights entitlements of some inherently requires preventing others from claiming and controlling those same resources (Hohfeld 1917; Calabresi and Melamed 1972). Before property rights can be strong or weak, they must be allocated and defined (Kennedy 2009)—and the allocation and enforcement of resource entitlements through legal institutions reflects the distribution of political power (Libecap 1989; Ensminger 1992; La Croix and Roumasset 1990; Sened 1997; Alston 1996; Firmin-Sellers 1996; Wyman 2005; Alston, Harris, and Mueller 2009).

Yet much recent cross-country research regarding property rights and economic development employs a black-box conception of property rights that effaces the heterogeneity in property rights enjoyment within countries (Acemoglu and Johnson 2005; Rodrik, Subramanian and Trebbi 2004; Bockstette, Chanda and Putterman 2002; Acemoglu, Johnson, Robinson 2001, 2002; Kaufmann, Kraay and Zoido-Lobaton 1999; Hall and Jones 1999; Clague, Keefer, Knack and Olson 1999; Knack and Keefer 1995). This one-dimensional conception of property rights ignores significant variation in the risk of expropriation faced by different ethnic, cultural, and religious groups in the same country.

Using a new set of indicators that measures the *property insecurity* of ethno-cultural minorities, this article finds that severe property insecurity for some groups often exists alongside secure property rights for other groups. In many countries, members of marginalized groups face significantly higher property insecurity than foreign investors and domestic elites. The cross-national indices of institutional quality widely used in the research literature—initially designed to assess the property security of foreign investors—fail to adequately account for the institutional framework encountered by marginalized minority groups.

A vast and significant body of scholarship has long held secure property rights to be a fundamental prerequisite for trade, efficient investments, credit access, liberty, government accountability, growth-promoting economic policies, and a myriad other engines of economic development (Rousseau 1754; Smith 1776; Marx 1867; Coase 1960; Demsetz 1967, Hayek 1976; Williamson 1985; North and Weingast 1989; North 1990; Besley 1995; Alston, Libecap and Schnieder 1996; Posner 1998; De Soto 2000; Acemoglu, Johnson and Robinson 2001; Field 2005; Udry and Goldstein 2008; Besley and Ghatak 2009). Yet, historically, economic development has often involved the expropriation of land and resources from marginalized minorities and the reallocation of these resources into the hands of those with access to the knowledge and capital necessary for efficient investment (World Commission on Dams 2000, Yelling 1977, Pierson 1938, PBS, n.d.). Reconciling this apparent contradiction requires recognizing that *whose property rights are secure* matters fundamentally for the economic implications of secure property rights.

This article shows that property rights for marginalized groups are not related to long-run development. Economic growth can occur when the property rights of elites are secure but marginalized minorities face high a risk of expropriation, because land may be reallocated into the hands of investors with better access to know-how, capital, and other complementary production inputs. At the same time, secure property rights for marginalized minorities are not required for the government accountability that facilitates aggregate growth-enhancing economic policies: security of property rights for elites can

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increase accountability of the governing elites towards other elites with divergent interests, while broad but not universal property rights security can generate accountability of public officials to the majority but still exclude the minority. Both mechanisms incentivize the adoption of broadly growth-enhancing economic policies that benefit the majority but harm some groups.

2 Theoretical Background

2.1 Law, Power, and Heterogeneity in Rights Enjoyment

It is an obvious statement that law is not impartial, but in fact reflects the distribution and operation of political power. Yet the vast majority of recent economics research on the relationship between property rights and economic development implicitly assumes that the laws of a country are applied uniformly to all without distinction. In the cross-national literature in particular, if a state is considered to have a high level of property rights security and strong protections for property rights, everyone's rights are taken as equally secure (Acemoglu and Johnson 2005; Rodrik, Subramanian and Trebbi 2004; Acemoglu, Johnson, Robinson 2001, 2002; Bockstette, Chanda and Putterman 2002; Kaufmann, Kraay and Zoido-Lobaton 1999; Hall and Jones 1999; Clague, Keefer, Knack and Olson 1999; Knack and Keefer 1995). Likewise, if a state is considered to have a low level of property rights security and weak protection for property rights, everyone's property rights are viewed as equally insecure. Disparities in property rights enjoyment between different groups within a country are largely ignored.

Work within institutional economics certainly recognizes that the 'rules of the game' depend on relations of power (e.g., Bates 1981; North and Weingast 1989; North 1990, 2005; Engerman and Sokoloff 1997, 2002; Kaufmann, Kraay and Zoido-Lobaton 2002; Acemoglu and Robinson 2006, 2008). The dialogic between institutional rules and organizational actors – in which individuals and organizations operate to maximize their own interests within a given set of incentives determined by the existing institutional constraints, but then also work to change these rules to their own benefit – is the

theoretical heart of the vast body of research that foregrounds the role played by institutions in long-run development.

Yet insufficient attention has been paid to the fact that not only the form of institutions, but also the scope and application of the rules, depends on politics and the distribution of power. Such a one-dimensional lens is particularly apt to distort reality in the case of the right to property, which is a zero-sum game. Protecting the resource claims of some parties inherently requires preventing others from using those same resources. Property rights must be defined and allocated before their protection can be strong or weak (Kennedy 2009). Given the zero-sum nature of property rights, alongside the role of political power in determining *de facto* institutional environments, the allocation and enforcement of resource entitlements is particularly prone to heterogeneous treatment of groups and claimants.

A property right is relational—it gives the possessor superior claims to a specific resource against the rest of the world, or some subset thereof (Hohfeld 1917: 718-733; Calabresi and Melamed 1972: 1089-1092). The possessor of a property right asserts and exercises her rights in relation to other potential claimants; she can simultaneously have superior rights against some, but inferior rights against others. For example, take a home owner who takes-out first one, then another, and then a third mortgage, using his home as collateral. If he defaults on all three loans, the holder of the first priority mortgage lien has the right to the value of the property up until the amount of the lien is satisfied, then the holder of the second priority lien—who has an inferior right compared to that of the first lender, but a superior claim to that of the third lender—has a right to the value of the property used as collateral until the debt is cleared, and so on (American Law Institute 1997). The common law rule of "finders keepers" likewise exemplifies the relational nature of property rights—the "finder" has superior rights to a found object against everyone except the original owner who lost the item (Armorie v. Delamirie 1722, Sprankling 2007). Clearly, therefore, the allocation and protection of a secure resource entitlement for one party inherently requires denying an alternative claimant the ability to control the use of that resource.

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The classical political economists recognized the relational nature of property rights and the role played by political power in defining, allocating, and enforcing claims to resource entitlements. Although Rousseau recognized secure private property rights as a prerequisite for market exchange and a functioning modern economy (Peled 1980), he also argued that the enshrinement of property rights in a social contract was, in essence, a grand theft perpetrated by the rich, clever, and strong on the less well-off (1754). Having obtained *de facto* control over land and resources, Rousseau contended that the *de jure* legal protection of these property rights claims protected and perpetuated the tenuous and previously contested position of elites (1754). Marx also argued that the private property relations that form the legal superstructure of capitalism entrench the already powerful (Marx 1844, 1867): in this view, private property leads to ever increasing inequality by enabling capital to be accumulated, and puts the owners of the means of production in an advantaged bargaining position vis-à-vis wage laborers, which allows the owners of capital to capture all surplus value.

The role of political power in determining the scope, allocation, and enforcement of property rights is readily apparent both historically and in the modern administrative state (Libecap 1989; Ensminger 1992; La Croix and Roumasset 1990; Sened 1997; Alston 1996; Firmin-Sellers 1996; Wyman 2005; Alston, Harris, and Mueller 2009).

The multiplicity of potential property rights that may or may not be recognized and protected by *de jure* and *de facto* legal institutions also contributes to heterogeneity in the enjoyment of secure property rights. Property rights are widely understood by legal scholars as a "bundle of sticks", with each stick in the bundle representing a right or a privilege (Korngold and Morriss 2009, Kennedy 2009). For example, the famous English case of *Sturges v. Bridgman,* on which Coase's well-known article *The Problem of Social Cost* (1960) was based, addressed whether a physician had the right to stop his next door neighbor, a confectioner, from operating his mortars to grind sugar. In the bundle of sticks that constituted property ownership, did the doctor have the right to enjoy silence so that he could see his patients undisturbed, or did the confectioner have the right to

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produce sugar in his factory? Coase argued that inefficiency results when neither right is clearly defined, thereby preventing bargaining; here the first order problem is clearly not in making the property right secure, but in defining and allocating it in the first place. The wide diversity of rights that may be enjoyed as part of a bundle of property rights is even more evident in low and middle income countries. Throughout Africa, for example, one user might have the right to sow and harvest, another to collect fruit from trees on the land, and a third to bring in livestock to feed on crop residues after the harvest (Bruce 1996, Benjaminsen 2002, Pande and Udry 2006). In southeast Nigeria and southern Mali the village leader allocates farming land to family heads based on need but retains reversionary rights to the land as a trustee on behalf of the group, while individuals have enduring rights to physical structures they build and any trees they plant. This means that one family could have temporary use rights to the soil while the son of the person who planted nut trees on the land the generation prior has the right to gather the nuts (Bruce 1996, Benjaminsen 2002, Boudreaux 2005). In the north-central flood plains of the Niger Delta, where herding, farming, and fishing coexist and are practiced by different ethnic groups, herders have the right to use given land for pasture during the off-season, while farmers use this same land to grow crops during a different part of the year (Bruce 1996, Dewees 1995). When some kinds of rights—some of the "sticks in the bundle"—are protected by property rights institutions, but others are not, the groups whose members enjoy the protected kinds of rights benefit, while those with unprotected rights lose out.

Therefore the scope of application of property rights protection can engender heterogeneity in the security of property rights enjoyment. If private freehold titles are protected, but various usufruct rights such as hunting, fishing, grazing cattle, and gathering berries are not, then the parties best positioned to claim private freehold ownership benefit while others lose access to formerly shared resources. Because property rights can be understood as a bundle of sticks, when different groups lay claim to different kinds of sticks, the recognition and protection of some rights in the bundle but not others creates heterogeneity in property rights security.

Cross-country comparative research—which aims to explain aggregate growth or other development outcomes with reference to institutional conditions for an entire country-unit—is particularly susceptible to the eliding of property rights' inherent complexity. The recent 'institutions and development' research has therefore unwittingly adopted a legal positivist approach, in which law is seen as inherently impartial in its application (Kelsen 1934)—if property rights are strong, they are strong for everyone; and if they are weak, then the threat of expropriation is widespread and looming for all. In contrast, legal realists have long sought to penetrate beyond stated rules and norms to understand how the law operates in action, highlighting the difference between the "law on the books" and "law in action" (e.g., Llwewllyn 1931, Weiner 2006). Heterogeneity in the scope and application of *de facto* institutions is effaced by a simplistic, legal positivist framework.

Due to the relational, zero-sum nature of property rights, as well as the complexity and multidimensionality of the bundle of rights that constitute property interests, we should expect that the role played by political power in determining the institutional rules of the game will often lead to heterogeneity between groups within a country in the enjoyment of property rights security—yet this is not the baseline assumption of the institutions and development research literature.

2.2 Property Rights and Economic Development

There is an extraordinarily large and diverse body of research regarding the relationship between property rights and economic development. Most social scientists—from classical political economists to contemporary legal scholars and new institutional economists—argue that secure property rights are a necessary prerequisite for economic development (Rousseau 1754; Smith 1776; Marx 1867; Hayek 1976; Williamson 1985; North and Weingast 1989; North 1990; Alston, Libecap and Schnieder 1996; Posner 1998; Acemoglu, Johnson and Robinson 2001; Rodrik, Subramanian, and Trebbi 2004; Besley and Ghatak 2009). However, implicit and unstated in most of these theories is that it fundamentally matters *whose property rights are secure*. At a micro level, only

secure property rights for those with skills, knowledge, and capital leads to economic growth. And at a macro level, only secure property rights for those who will use their political voice to agitate for growth enhancing economic policies is related to long-run development.

At a micro level, secure property rights are thought to generate economic growth for three reasons. First, secure property rights internalize externalities, thereby incentivizing efficient levels of investment and ensuring that a resource is neither over nor under-utilized (Demsetz 1967, Besley 1995, Field 2005, Udry and Goldstein 2008). Second, clear allocation and enforcement of resource entitlements can generate efficiency gains by reducing transaction costs in exchanges between parties and allowing reallocation to more efficient users (Coase 1960, Besley and Ghatak 2009). Third, secure private property rights may facilitate access to credit and the conversion of dead assets into investment capital because the underlying asset can serve as collateral, making repayment commitments more enforceable (De Soto 2000, Field and Torero 2006). Markets, credit access, and efficient resource use drive economic growth by enabling specialization and gains from trade, providing capital for reinvestment, and increasing productivity.

At the core of these micro-theories of property rights and economic development is an assumption that what actually matters is property rights security for those with access to skills, knowledge, and capital. Appropriate know-how and access to capital is obviously implicit in the internalization of costs and benefits rationale for secure private property rights, since efficient levels of investment and resource utilization can only occur when the owner has complementary production inputs (Besley and Ghatak 2009, sec. 2.3). Moreover, a growth-enhancing reallocation of resource entitlements into the hands of more efficient users will not occur – even and especially with secure private property rights – when the existence of multiple owners creates a hold-up problem (Heller 1998), or when owners place an idiosyncratic, non-economic value on the property (Radin 1982). And when property rights are *secure* but non-alienable, as is the case with forests, pastures, and fisheries held collectively according to indigenous customary tenure law (Bruce 1998), greater property rights security for customary resource holders will

actually prevent reallocation through voluntary market exchange. Therefore secure property rights for owners who lack the skills or capital to invest efficiently in a resource but who also will not or cannot bargain for some reason (Heller 1998, Radin 1982, Bruce 1998) may actually prevent a more economically efficient allocation of resources and impede growth. The credit access theory explicitly recognizes the relationship between property rights, access to capital, and growth, but if the poor are credit constrained for exogenous reasons such as ethnic discrimination (Duca and Rosenthal 1993), or actually face savings rather than credit constraints (Dupas and Robinson 2009, Morduch 1999), and then making property rights more secure will not "unlock" hidden capital.

At a macro level, a number of Western political theorists have argued that secure private property rights engender political accountability, which in turn leads economic policies that are broadly growth-enhancing rather than narrowly beneficial to only powerful, rent-seeking elites. According to this view, private property is an essential pillar in the protection of individual liberty; the individual economic security private property provides is thought to act as a safeguard against the potentially totalitarian power of the State, and individuals are much more likely to actively oppose government policies when they know their livelihoods are not at risk (Hayek 1976). The resulting political accountability to a broad cross-section of the population encourages governments to implement economic policies that benefit society as a whole, such as investments in education, roads, and other public goods (Engerman and Sokoloff 1997, 2002, 2005).

Relatedly, some theorists argue that the failure of political interest groups to implement the most effective growth promoting policies and then use political power to bargain over distribution results from a commitment problem, which stems from weak property rights (Acemoglu 2003; Acemoglu, Johnson, and Robinson 2004). Since political power is in part a result of economic power, political groups who benefit relatively less from growth enhancing economic policies, and foresee that their relative economic position will decline and thus their relative political strength as well, will resist pie-maximizing economic policies that hurt their relative economic positions—in fear that newly ascendant political-economic elites will change the rules of the game mid-stream. Strong

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protections against government expropriation theoretically allow the commitment problem to be overcome by ensuring that those who gain in relative economic strength will not use their new political power to seize the assets of those who gain less from pie maximizing growth policies.

Others starkly disagree, contending that private property reinforces rather than constrains the power of elites, because it is precisely the institution of private property that puts the owners of capital inputs in an advantaged bargaining position vis-à-vis labor. In this view, private property relations facilitate the increasing concentration of economic capital and corresponding political power, rather than serving as a check on government authority (Chibber 2003; Hay 1975; Mandel 1992; Marx 1867).

A far more nuanced understanding of the role played by secure property rights in generating government accountability and constraining the power of elites is clearly required. Elites are not a single monolithic group—different groups of elites have different interests, and compete amongst themselves for power (Dezalay and Garth 2002). Security of property rights for elites can therefore increase accountability of the governing elites towards other elites with divergent interests (Buchanan and Tullock 1962), incentivizing the adoption of broadly beneficial economic policies. Likewise, accountability of public officials to the majority, facilitated by broad but not universal property rights security, may incentivize growth-enhancing economic policies that benefit the majority even while hurting some groups. Seen in this light, secure property rights for marginalized minorities is not required for the kind of government accountability that leads to aggregate, growth-enhancing economic policies. Once again, security of property rights for whom matters.

3 Property Rights Indicators

3.1 Political Risk Services' International Country Risk Guide and the Heritage Foundation's Index of Economic Freedom

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The International Country Risk Guide (ICRG), a component of Political Risk Services (PRS), was first created in 1980 by the editors of a weekly newsletter on international finance and economics called *International Reports*. The purpose of the ICRG was to "meet the needs of clients for an in-depth and exhaustively researched analysis of the potential risks to international business operations" (Political Risk Services, n.d.). According to PRS, the primary users and consumers of the ICRG ratings data are institutional investors, banks, multinational corporations, importers, exporters, and foreign exchange traders, who use the ICRG model to "determine how financial, economic, and political risk might affect their business and investments now and in the future" (Political Risk Services, n.d.).

The risk ratings system has 22 components grouped into three major categories of risk: political, financial, and economic. Each component is assigned a numerical value, with the highest number of points indicating the lowest risk. ICRG scores are based on a subjective assessment by experts employed by PRS. The property rights index evaluates the risk of "outright confiscation and forced nationalization" of property. Lower ratings are assigned to countries "where expropriation of private foreign investment is a likely event" (IRIS, n.d.).

Given that the intended customers of the ICRG are investors, multinational corporations, importers, and exporters, it is only logical that the ranking system would be targeted to reflect the investment risks posed to these kinds of customers. In other words, the information on expropriation risk, by its very design, is meant to reflect the risk posed to the enterprises of the large and often multinational businesses that are purchasing the ICRG data, not the average citizen of a country—and even less the property rights of marginalized ethno-cultural minority groups, who are clearly not purchasing the ICRG data. This intentional evaluation of risk from the standpoint of foreign investors and domestic elites is reinforced by the source of the data – expert evaluations – which are likely to be more familiar with threats to international capital than to poor local resource users (Davis 2004).

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A number of other indices also attempt to quantitatively measure property rights across countries. Most prominently, the Heritage Foundation scores "the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws" (Heritage Foundation 2009). The Heritage Foundation's property rights indicator is expansive, addressing: the likelihood that private property will be expropriated, the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts (Heritage Foundation 2009). Like the ICRG index, the less certain the legal protection of property, the lower a country's score. For example, a country receives 100% if "private property is guaranteed by the government. The court system enforces contracts efficiently and quickly. The justice system punishes those who unlawfully confiscate private property". At the other extreme, a country receives a score of 0% when "private property is outlawed, and all property belongs to the state". The index is a subjective score, based on information gleaned from the following sources, in order of priority: Economist Intelligence Unit, *Country Commerce*; U.S. Department of Commerce, *Country Commercial Guide*; U.S. Department of State, *Country Reports on Human Rights Practices*; and U.S. Department of State, *Investment Climate Statements*. Once again, all these sources except for the U.S. State Department Reports have as their primary audience large commercial investors interested in assessing the investment risks posed to their business ventures. Moreover, countries receive high scores only for securely protecting private property rights; secure protection of the communal property rights of ethno-cultural minorities is not considered by the index. This is a significant shortcoming, given that throughout Africa, Latin America, Asia, North America, and Europe, over 300 million members of an estimated 6,000 indigenous groups hold land communally in accordance with customary law (Stavenhagen 2004, UN Permanent Forum on Indigenous Issues 2009).

3.2 Property Rights Indices in the Cross-Country Literature

The property rights index from PRS's International Country Risk Guide (ICRG) has been widely used in the cross-country literature as a proxy for "institutional quality" broadly,

and for the security of property rights more specifically. For example, in their well-known article examining the relationship between institutions and long-run growth, Knack and Keefer (1995) used a re-scaled version of the ICRG index score to measure "institutional quality". The frequently cited work of Acemoglu, Johnson and Robinson, in which settler mortality is used as an instrumental variable for institutions, also relies upon the ICRG risk of expropriation index as a proxy for institutional quality (2001, 2002). The ICRG index is also pervasive in the cross-country research on the relationship between natural resource abundance, institutions, growth, and conflict (Boschini, Pettersson, and Roine 2007; Djankov and Reynal-Querol 2007; Mehlum, Moene, Torvik 2006).

The World Bank's widely used Worldwide Governance Indicators [WGI], initially developed by Kaufmann, Kraay, and Zoido-Lobaton (1999), incorporate the Heritage Foundation's property security measure as well as the property rights measure from ICRG. The WGI consists of aggregate indices corresponding to six basic governance concepts: (1) Voice & Accountability; (2) Political Instability & Violence; (3) Government Effectiveness; (4) Regulatory Burden; (5) Rule of Law; and (6) Graft. These aggregate indices are based on approximately 200 governance indicators, taken from 35 data sources—including both the ICRG and the Heritage Foundation Index (Kaufmann, Kraay, and Mastruzzi 2009). It would be difficult to overstate the reach and influence of the WGI as a research tool in cross-country analysis. The most recent *Governance Matters* publication (Kaufmann, Kraay, and Mastruzzi 2009) ranks as one of the top 50 downloads on SSRN; and according to a search of the World Bank's Governance Matters website and SSRN, the Worldwide Governance Indicators have been used in over a hundred and fifty research papers as aggregate measures of governance and institutional quality.

3.3 A New Measure: Property Insecurity of Minority Groups

This article presents an alternative *Property Insecurity Index*, specifically designed to evaluate the security of property rights enjoyed or not enjoyed by marginalized groups,

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rather than foreign investors and domestic elites. The *Property Insecurity Index* is a composite index based on the Minorities at Risk (MAR) database.

The MAR database, generated by the University of Maryland's Center for International Development and Conflict Management, assesses the political and economic exclusion of ethno-cultural minorities in every country with a population of at least 500,000 (Center for International Development and Conflict Management, 2009). Experts assign a numerical score indicating the severity of exclusion to each group along an array of political, economic, social, and cultural dimensions. A "minority at risk" is defined as "an ethno political group (non-state communal group) that collectively suffers, or benefits from, systematic discriminatory treatment vis-à-vis other groups in a society; and/or collectively mobilizes in defense or promotion of its self-defined interests." The following four variables identify the factors present in the group which make it a minority at risk: (1) the group is subject to discrimination at present; (2) the group is disadvantaged due to past discrimination; (3) the group is an advantaged minority; and (4) the group supports political organizations advocating greater group rights. Groups are included in the MAR database if the group has a population larger than 100,000 or greater than 1 percent of a country's population.

The *Property Insecurity Index* is a composite measure of the property insecurity experienced by each minority group in every country included in the MAR database. The property insecurity score for each group is based on MAR scores in three dimensions: dispossession from land, forced internal resettlement, and internal resettlement by policy. Like the ICRG and Heritage Foundation indices, the Property Insecurity Index measures the *de facto*, rather than *de jure*, protection from expropriation experienced by ethno-cultural minority groups. The index detects state failure to protect the property rights of minority groups from incursions by other (possibly more powerful and influential) private actors, as well as direct state acts of expropriation. Country *Property Insecurity* scores are generated by aggregating the property insecurity scores of all minority groups within each country.

There are three versions of the *Property Insecurity Index.* The first, *Property Insecurity (Weighted)*, is a sum of group property insecurities weighted by the group's proportion of the country population. The second, *Property Insecurity (Max)*, reflects the property insecurity of the worst-off group in a country. The third, *Property Insecurity (Mean)* reflects the average property insecurity score of minority groups within a country. All three versions are compared to the ICRG and Heritage Foundation Indices in Section 4. *Property Insecurity (Max)* is then used to examine the relation between property insecurity for marginalized groups and long-run development, as this measure best captures the most severe property insecurity faced by any group in a country.

Property Insecurity for Group G = P_g = (eviction$_g$ + forced_resettle$_g$ + resettle_policy$_g$)/3
Property Insecurity for Country I (Weighted) = PI_i = Σ(gpro$_g$)P_g
Property Insecurity for Country I (Max) = PI_i = P_{worst}
Property Insecurity for Country I (Mean) = PI_i = Average(P_g)

Where gpro$_g$ = group's proportion of the population, eviction$_g$ = dispossession from land, forced_resettle$_g$ = forced internal resettlement, and resettle_policy$_g$ = internal resettlement by policy.

Group discrimination and bias are evaluated relative to other groups within the country. Therefore if property rights are uniformly insecure for all groups in a country, or if the general population suffers from insecure property rights but no groups are present in the country that are categorized as ethno-cultural minorities by the MAR definition, then the country will receive a score equivalent to zero property insecurity, although this does not reflect secure property rights for all.

This *Property Insecurity* Index departs fundamentally from other measures of institutional quality in two ways. First, it relies on data sources that assess the experience of the worst-off populations in a country—precisely those who are supposedly the intended targets of economic development initiatives. And second, it explicitly aims to capture and aggregate the experience of many groups within a single country, rather than

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attempting to present an overall country measure of the average level of institutional quality supposedly experienced by everyone. In this sense, the conceptual starting point of the *Property Insecurity* measure is that a single indicator of property rights (or 'institutional quality' more broadly) may potentially efface heterogeneity in rights enjoyment; an index that measures only averages, or the situation of elites, or both, inherently cannot detect variations in the experiences of different groups.

4 Comparing Indices

4.1 ICRG & Heritage Foundation Property Rights Indices versus Property Insecurity Index

The basic question of whether or not aggregate cross-country indices of property rights security reflect the property rights enjoyed by ethno-cultural minorities can be answered empirically by examining the degree to which widely used measures of property rights institutions correlate with the security of property rights enjoyed by minority groups. If property rights are homogenous within countries, as implicitly assumed in the cross-country institutions and development research, then all measures of property rights security would be highly correlated—with any correlation less than one reflecting only the measurement error generated by the assignation of scores through subjective evaluation. The ICRG index and the Heritage Foundation index should therefore be highly and positively correlated with each other, and both should be inversely related to the Property Insecurity Index. If instead property rights are indeed enjoyed heterogeneously by different groups with the same country, but the aggregate property rights indices are still reflecting the rights enjoyed by ethno-cultural minorities—as opposed to simply measuring the rights enjoyment of foreign investors and domestic elites—then the ICRG and the Heritage Foundation Property Rights Indices should be highly and inversely related to the Weighted Property Insecurity Index, and weakly and inversely related to the Mean Property Insecurity Index.

The empirical evidence instead suggests both (a) that property rights are indeed heterogeneous, and (b) that existing widely used cross-country indices of property rights

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fail to consider the property security of marginalized minorities at all. Although the Heritage Foundation and the ICRG measures indeed correspond highly with each other, neither are at related to any of the measures of property rights enjoyed by minority groups. These results are below in Tables 2 and 3, which show Kendall's rank correlation coefficients for the different property rights measures. The data availability for the Heritage Foundation and the ICRG measure differ, so Table 1 takes the years available for the ICRG Index as the baseline dataset, while Table 2 takes the years available for the Heritage Foundation Index as the baseline dataset. Kendall's coefficient is the appropriate measure of correlation because the data is not normally distributed—the Heritage Foundation and ICRG measures are left-skewed, while the Property Insecurity Index has a large number of zero value observations and is therefore right-skewed. Unlike Pearson's correlation coefficient, the Kendall coefficient does not assume normality. And unlike Spearman's coefficient, Kendall's coefficient is robust to "ties", i.e., identical values for different observations. Regardless of the time period, the correlation between the two aggregate measures of property security for elites and foreign investors—the ICRG and Heritage Foundation Indices—is very high. In contrast, there is no relationship whatsoever between the property rights of marginalized minorities and the ICRG or Heritage Foundation measures. The scatter plot graphs following the correlation tables further illustrate that the lack of any significant correlation is not an artifact of some nonlinear relation; there simply is no relation.

	Whole World	High Income	Low Income	Oceania	Asia	Africa	Latin America and Caribbean	North America	Europe	AJR Sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log GDP per capita (PPP) in 1995	8.37	9.45	7.30	8.35	8.45	7.24	8.62	10.33	9.47	8.07
	(1.27)	(0.07)	(0.07)	(0.29)	(0.20)	(0.14)	(0.10)	(0.10)	(0.14)	(0.15)
Log GDP per capita (PPP) in 2005	8.64	9.74	7.54	8.42	8.78	7.48	8.84	10.55	9.80	8.26
	(1.30)	(0.07)	(0.08)	(0.32)	(0.19)	(0.15)	(0.11)	(0.09)	(0.11)	(0.15)
HDI Score, 1995-2000	0.69	0.84	0.55	0.75	0.71	0.50	0.74	0.94	0.86	0.64
	(0.18)	(0.01)	(0.02)	(0.07)	(0.02)	(0.02)	(0.02)	(0.00)	(0.01)	(0.02)
HDI Score, 2005	0.73	0.86	0.59	0.75	0.75	0.53	0.80	0.96	0.89	0.67
	(0.18)	(0.01)	(0.02)	(0.05)	(0.02)	(0.02)	(0.01)	(0.00)	(0.01)	(0.02)
ICRG Property Rights, 1985-1995	7.06	8.18	6.00	7.32	7.06	5.77	6.39	9.87	9.14	6.54
	(1.85)	(0.18)	(0.17)	(1.57)	(0.28)	(0.21)	(0.22)	(0.13)	(0.18)	(0.18)
Heritage Foundation Property Rights, 1995-2004	50.76	63.23	39.50	64.40	47.09	40.56	50.13	90	63.20	49.70
	(22.69)	(2.47)	(1.53)	(10.55)	(3.62)	(2.21)	(3.73)	(0.00)	(3.77)	(2.46)
Property Insecurity Weighted, 1985-1995	1.22	1.19	1.26	1.05	1.26	1.17	1.46	1.02	1.01	1.30
	(0.55)	(0.06)	(0.10)	(0.05)	(0.08)	(0.11)	(0.20)	(0.02)	(0.01)	(0.09)
Property Insecurity Mean, 1985-1995	2.01	1.88	2.14	1.60	2.24	1.49	3.10	1.25	1.72	2.20
	(1.50)	(0.19)	(0.21)	(0.56)	(0.29)	(0.16)	(0.44)	(0.25)	(0.23)	(0.21)
Property Insecurity Max, 1985-1995	2.64	2.47	2.79	1.56	3.16	1.92	3.38	1.75	2.59	2.89
	(2.10)	(0.25)	(0.30)	(0.56)	(0.41)	(0.27)	(0.44)	(0.75)	(0.49)	(0.29)
Property Insecurity Weighted, 1995-2003	1.18	1.11	1.17	1.00	1.28	1.23	1.10	1.03	1.10	1.10
	(0.59)	(0.05)	(0.08)	(0.00)	(0.12)	(0.14)	(0.04)	(0.03)	(0.04)	(0.03)
Property Insecurity Mean, 1995-2003	1.79	1.81	1.66	1.29	1.97	1.70	2.37	1.40	1.30	1.81
	(1.26)	(0.21)	(0.13)	(0.15)	(0.26)	(0.25)	(0.26)	(0.40)	(0.09)	(0.15)
Property Insecurity Max, 1995-2003	2.35	2.31	2.17	1.31	2.76	2.12	3.01	2.19	1.70	2.40
	(1.79)	(0.25)	(0.20)	(0.15)	(0.38)	(0.32)	(0.34)	(1.19)	(0.22)	(0.22)
Countries	198	87	87	14	49	53	37	2	42	64

Table 1. Descriptive Statistics

Values are averages during sample period, with standard deviations in parentheses. Columns 2 and 3 split the sample in column 1 by the median income during the relevant period (from the World Bank's World Development Indicators 2008) in the sample of column 1. The ICRG property rights index is the 0 to 10 scaled ICRG/IRIS version used by Acemoglu, Johnson, and Robinson (2001, 2002).

Table 2. Correlations: 1985-1995

		ICRG Property Rights, 1985-1995	Heritage Foundation Property Rights, 1995-2004	Property Insecurity Weighted, 1985-1995	Property Insecurity Mean, 1985-1995	Property Insecurity Max, 1985-1995
ICRG Property Rights, 1985-1995	Correlation	1				
	N	83				
Heritage Foundation Property Rights, 1995-2004	Correlation	0.517*	1			
	N	83	83			
Property Insecurity Weighted, 1985-1995	Correlation	-0.142	-0.043	1		
	N	83	83	83		
Property Insecurity Mean, 1985-1995	Correlation	-0.108	-0.083	0.582*	1	
	N	83	83	83	83	
Property Insecurity Max, 1985-1995	Correlation	-0.116	-0.132	0.566*	0.801*	1
	N	83	83	83	83	83

*Notes: 'Property Insecurity Weighted' is the sum of group property insecurity scores, weighted by their proportion of the population; 'Property Insecurity Maximum' is the property insecurity score of the worst off group; 'Property Insecurity Mean' is the unweighted average of group property insecurity scores. * represents significance at the 5% level.*

Table 3. Correlations: 1995-2004

|		Heritage Foundation Property Rights, 1995-2004	ICRG Property Rights, 1985-1995	Property Insecurity Weighted, 1995-2003	Property Insecurity Mean, 1995-2003	Property Insecurity Max, 1995-2003
Heritage Foundation Property Rights, 1995-2004	Correlation	1				
	N	89				
ICRG Property Rights, 1985-1995	Correlation	0.526*	1			
	N	89	89			
Property Insecurity Weighted, 1995-2003	Correlation	-0.023	-0.068	1		
	N	89	89	89		
Property Insecurity Mean, 1995-2003	Correlation	-0.143	-0.098	0.662*	1	
	N	89	89	89	89	
Property Insecurity Max, 1995-2003	Correlation	-0.161*	-0.087	0.680*	0.880*	1
	N	89	89	89	89	89

Notes: 'Property Insecurity Weighted' is the sum of group property insecurity scores, weighted by their proportion of the population; 'Property Insecurity Maximum' is the property insecurity score of the worst off group; 'Property Insecurity Mean' is the unweighted average of group property insecurity scores. * represents significance at the 5% level. Phase IV release of the MAR dataset includes data from 1945-2003.

Figure 1. Scatterplot of Correlations: 1985-1995
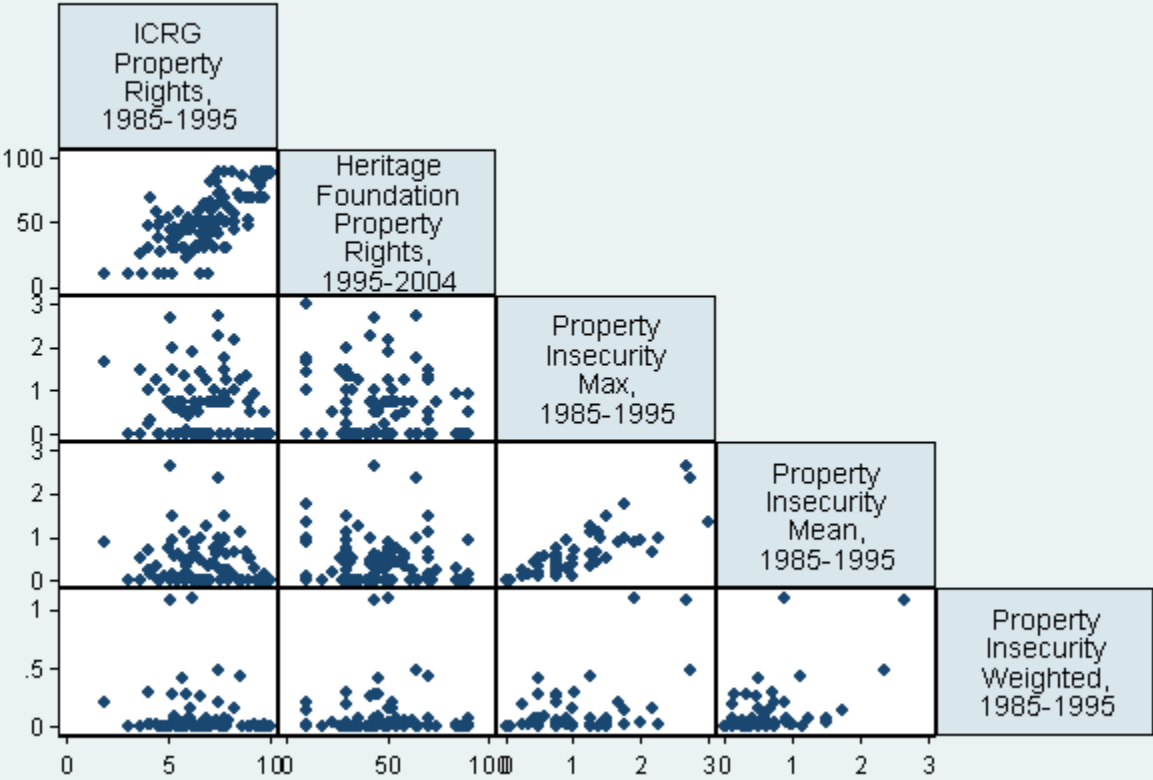
Figure 2. Scatterplot of Correlations: 1995-2004
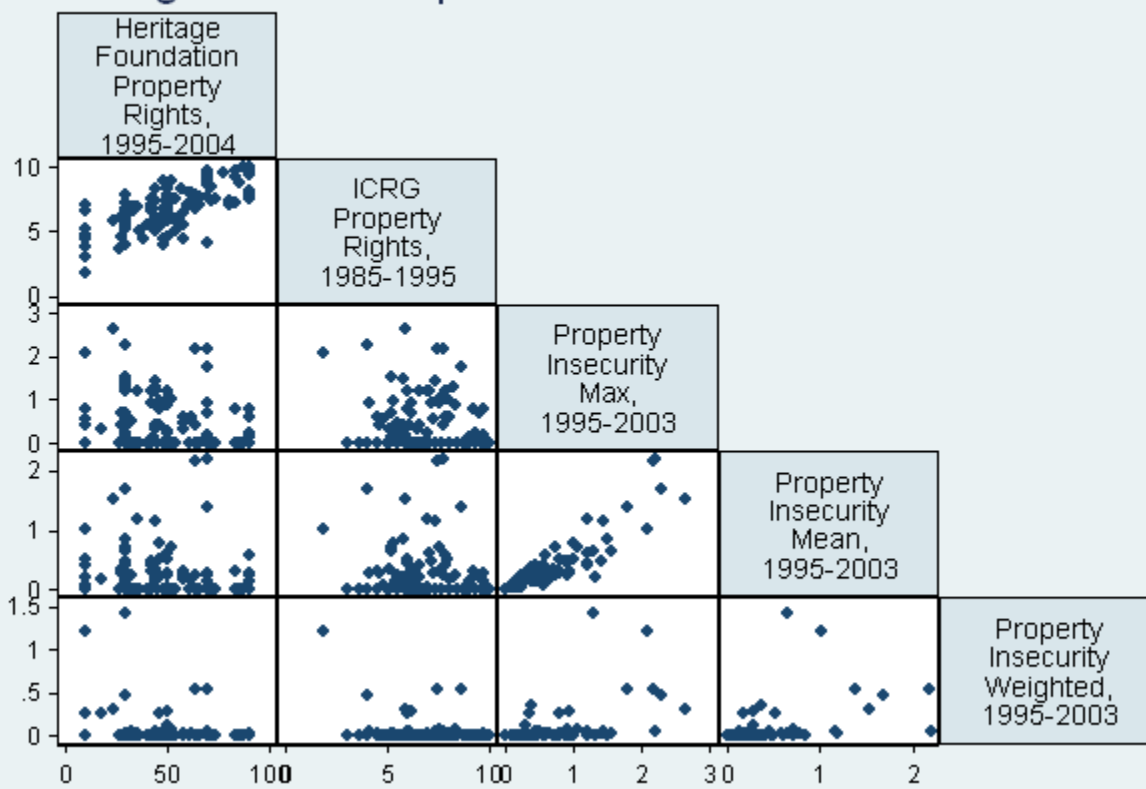
4.2 Economic Development

This section tests the hypotheses that the political and economic implications of secure property rights depend on *whose property rights are secure*, and that the security of property rights for marginalized minorities is irrelevant for long-run economic development.

A generalized least squares (GLS) model with bootstrapped standard errors is used to regress log per capita income on the indices of property rights from ICRG, Heritage Foundation, and the new measures of Property Insecurity. Results are reported in Table 4.

The nonparametric approach of bootstrapped standard errors was adopted because the empirical distribution of the primary variable of interest—Property Insecurity—does not meet parametric assumptions, and there is no a priori theoretical reason to assume any particular asymptotic population distribution.   Therefore in order to accurately assess statistical significance, a technique which is

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applicable regardless of the form of the data's probability density function had to be utilized. Bootstrapping entails estimating the sampling distribution by sampling with replacement from the original data, and allows hypothesis testing based on the empirical population distribution even when data is nonparametric and violates common assumptions regarding continuity or parametric families (Efron and Tibshirani 1984). The results in Table 4 are based on resampling with replacement 1000 times.

The linear regressions are for the equation:

$$\log y_i = \alpha + \beta P_i + \mu X_i + \epsilon_i \tag{1}$$

where y_i is GDP per capita in country i, P_i is the property rights measure, X_i is a vector of covariates, and ϵ_i is the random error term. The coefficient of interest is β, which measures the effect of property security and insecurity on per capita income. An alternative specification, where the outcome of interest is the composite Human Development Index (HDI), from the UNDP Human Development Reports Office, is also examined. The Human Development Index is an average of life expectancy, literacy rates plus gross school enrollment, and log per capita income.

The Property Insecurity scores are the average from 1985 to 2003, the most recent time period for which MAR data was available for group dispossession from land, forced internal resettlement, and internal resettlement by policy. The ICRG Property Rights index is the average for 1985 to 1995, the time period available in the IRIS data and widely used in previous studies (Knack and Keefer 1995; Acemoglu, Johnson and Robinson 2001, 2002; Boschini, Pettersson, and Roine 2007; Djankov and Reynal-Querol 2007; Mehlum, Moene, Torvik 2006). Heritage Foundation Property Rights scores are the average for the ten year period beginning in 1995, the first year for which data is available. Dependent variables are for 2005 to mitigate the possibility of reverse causality. Regional dummies are based on classifications from the United Nations Development Programme (UNDP). This approach was adopted because the conventional choice for regional dummies – the World Bank's regional classifications – is endogenous, as the World Bank regions themselves are defined on the basis of per capita income (Easterly 2007).

The large sample cross-country GLS regression results in Table 4 reaffirm robust previous findings of a strong correlation between long-run development and security of property rights for foreign investors and domestic elites, but show no relationship between the property insecurity of marginalized minority groups and either GDP per capita or HDI. Countries in which segments of the population suffer from severe

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property insecurity often have relatively high levels of per capita income and high achievement in terms of human development outcomes, reflecting steady economic growth rates since 1500.

Table 4. Large Sample: Cross-Sectional GLS Regressions of Long-Run Development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dependent Variable: Log per capita GDP, 2005											
Property Rights (ICRG), 1985-1995		0.603***	0.446***								
		(0.04)	(0.07)								
Property Rights (Heritage Foundation), 1995-2004				0.041***	0.031***						
				(0)	(0)						
Ln Property Insecurity Mean, 1985-2003						0.03	-0.037				
						(0.22)	(0.25)				
Ln Property Insecurity Max, 1985-2003								0.01	-0.074		
								(0.01)	(-0.17)		
Ln Property Insecurity Weighted, 1985-2003										-0.632	-0.25
										(0.52)	(0.38)
Latin America and the Caribbean dummy	-1.717*		-0.252		-0.573		-1.815**		-1.802**		-1.795***
	(0.68)		(0.39)		(0.58)		(0.62)		(0.61)		(0.61)
Asia dummy	-1.769*		-0.252		-0.54		-1.934**		-1.930**		-1.917**
	(0.71)		(0.39)		(0.57)		(0.62)		(0.62)		(0.62)
Africa dummy	-3.073***		-1.334**		-1.567**		-3.272***		-3.280***		-3.202***
	(0.69)		(0.44)		(0.57)		(0.61)		(0.61)		(0.6)
Europe dummy	-0.754		-0.132		0.065		-1.017		-1.023		-1.012
	(0.68)		(0.32)		(0.56)		(0.61)		(0.61)		(0.6)
Oceania dummy	-2.134**		-0.734		-0.836		-1.459		-1.478		-1.463
	(0.74)		(0.63)		(0.65)		(0.91)		(0.86)		(0.85)
R^2	0.435	0.581	0.683	0.471	0.667	0	0.507	0	0.508	0.016	0.497
Number of observations	178	120	120	157	157	112	112	112	112	110	110
Dependent Variable: HDI Score, 2005											
Property Rights (ICRG), 1985-1995		0.079***	0.047***								
		(0.01)	(0.01)								
Property Rights (Heritage Foundation), 1995-2004				0.005***	0.003***						
				(0)	(0)						
Property Insecurity Mean, 1985-2003						0.012	-0.017				
						(0.03)	(0.02)				
Property Insecurity Max, 1985-2003								0.008	-0.016		
								(0.02)	(0.02)		
Property Insecurity Weighted, 1985-2003										-0.088	-0.041
										(0.07)	(0.04)
Latin America and the Caribbean dummy	-0.164*		-0.011		-0.054		-0.168*		-0.171**		-0.172**
	(0.07)		(0.07)		(0.07)		(0.07)		(0.06)		(0.06)
Asia dummy	-0.208**		-0.051		-0.079		-0.211**		-0.212**		-0.211***
	(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.06)
Africa dummy	-0.426***		-0.247***		-0.289***		-0.454***		-0.456***		-0.448***
	(0.07)		(0.07)		(0.07)		(0.07)		(0.06)		(0.06)
Europe dummy	-0.069		-0.007		0.01		-0.093		-0.095		-0.093
	(0.07)		(0.06)		(0.07)		(0.06)		(0.06)		(0.06)
Oceania dummy	-0.209*		-0.094		-0.093		-0.161		-0.166		-0.162
	(0.09)		(0.094)		(0.08)		(0.11)		(0.11)		(0.12)
R^2	0.613	0.53	0.752	0.362	0.748	0.001	0.684	0.001	0.685	0.016	0.674
Number of observations	173	120	120	156	156	110	110	110	110	108	108

Notes: Dependent variables are log GDP per capita (PPP) and the Human Development Index score; Property Rights (ICRG) is the 0 to 10 scaled version from IRIS where a higher score means more protection against expropriation; Property Insecurity Weighted is the sum of minority group insecurity weighted by the group's proportion of the population; Property Insecurity Max is the property insecurity score for the worst-off group in a country; Property Insecurity Mean is the unweighted average of group property insecurity scores; higher property insecurity scores indicate higher levels of property insecurity (the inverse of the property rights indicator); the omitted continent dummy is for North America; all property insecurity scores are logged to base e. Standard errors in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

The failure to find a significant relationship between property insecurity and GDP per capita or HDI means only that the standard for rejecting the null hypothesis was not met. It does not mean we can conclude that there is definitely no relationship between property insecurity and long-run economic development, as it would take an infinite amount of evidence to actually prove the null hypothesis of no relationship (just as we cannot definitively prove God does not exist, we cannot definitely prove the absence of a relationship between property insecurity and long-run development). However, we can evaluate the probability that a significant effect was likely to be detected given a hypothesized effect size, the number of variables, and the sample size.

Therefore we provide here an assessment of the likelihood of a Type II error. A Type II error occurs when the null hypothesis is false but a statistical test fails to reject it. The power of a hypothesis test is the probability that the null is correctly rejected and a treatment effect will be detected when one occurs; therefore power equals 1 minus the probability of a Type II error. Here a Type II error would exist if the null hypothesis—that Property Insecurity is irrelevant for long-run development—were in fact false, but our econometric model indicated no significant relationship between either HDI or GDP per capita and a country's level of property insecurity, thereby failing to reject the null hypothesis even though it is not true.

The probability of a Type II error is symbolized by β. To find β, a hypothesized R^2 of the model including a Property Insecurity indicator is compared with the R^2 of the model including only the control variables (effect size = E), given the number of observations (N), the number of variables in the full model (V), the number of test variables (T), and the α-level chosen as the cut-off of statistical significance.

$$E = R^2_f - R^2_r \qquad\qquad (4)$$
$$P(\text{Type II Error}) = \beta \qquad\qquad (5)$$
$$\beta\ (E, N, V, T, \alpha) \qquad\qquad (6)$$

Figure 3 shows the number of observations required for Type II error likelihoods of less than or equal to 5% (β = .05) and 10% (β = .1), for a hypothesized effect of in $R^2 = 0.05$ and $R^2 = 0.10$, in our model with 6 variables, across the ranges of R^2 values encountered in the large sample

GLS regressions shown in Table 4, at a significance level of $\alpha = 0.10$. Because lower values of α increase the likelihood that an econometric model will fail to reject a null hypothesis even if false, I use the 10% significance level, the highest α-value commonly used in the literature, in order to guard against such a Type II error. Because the smaller the hypothesized effect the larger the number of observations required to reduce the likelihood of a false negative, I examine the probability of Type II errors for relatively small hypothesized effects.

Figure 3 illustrates that the likelihood of Type II error is small for our regression models. For a hypothesized effect of $E = R^2_f - R^2_r = 0.1$, $\beta < .05$ at all relevant R^2 values, while for a hypothesized effect of $E = 0.5$, $\beta < .05$ at all but the lowest bounds of the R^2 range. In other words, for all models, at even a small hypothesized effect the likelihood of a Type II error is less than 10%, while for a slightly larger hypothesized effect the likelihood falls to 5% or less.

FIGURE 3.

$V = 6; \alpha = 0.10$	**Hypothesized change in $R^2 = 0.05$**		**Hypothesized change in $R^2 = 0.10$**	
$E = R^2_f - R^2_r$	$\beta = .05$	$\beta = .1$	$\beta = .05$	$\beta = .1$
0.400 - 0.350	N=132	N=104		
0.400 - 0.300			N=68	N=52
0.500 - 0.450	N=112	N=88		
0.500 - 0.400			N=56	N=44
0.600 - 0.550	N=88	N=70		
0.600 - 0.500			N=44	N=36
0.700 - 0.650	N=68	N=52		
0.700 - 0.600			N=34	N=28

The base sample used by Acemoglu, Johnson, and Robinson (2001, 2002) in their well-known paper arguing that institutional quality is a fundamental determinant of economic development is limited to 64 ex-colonies for which data is available on settler mortality. I use this limited sample and reproduce their OLS specification to examine the impact of Property Insecurity within the same universe of observations and using the same regression strategy, so that findings can be directly compared. Here the Property Insecurity index covers the period 1985 to 1995,

the same timeframe as the ICRG Property Rights measure, and the continent dummies, latitude control, and year for the per capita GDP dependent variable are also the same as those used by Acemoglu, Johnson, and Robinson (2001, 2002). Once again, results in Table 5 indicate no relationship between property insecurity of marginalized minorities and long-run economic development.

Table 5. AJR Sample: OLS Regressions of Long-Run Development

Dependent Variable: Log per capita GDP, 1995

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Property Rights (ICRG), 1985-1995	0.52*** (0.06)	0.46*** (0.07)	0.42*** (0.06)	0.40*** (0.06)												
Property Insecurity Weighted, 1985-1995					0.17 (0.68)	0.18 (0.61)	0.40 (0.50)	0.37 (0.47)								
Property Insecurity Max, 1985-1995									-0.08 (0.32)	-0.06 (0.29)	-0.22 (0.25)	-0.23 (0.24)				
Property Insecurity Mean, 1985-1995													0.18 (0.46)	0.15 (0.41)	-0.60 (0.38)	-0.59 (0.36)
Latitude		1.71** (0.72)		0.98 (0.64)		3.55*** (0.97)		2.00** (0.81)		3.55*** (0.97)		2.02** (0.80)		3.55*** (0.97)		2.00** (0.79)
Asia dummy			-0.71*** (0.24)	-.65*** (0.24)			-0.75** (0.32)	-.64** (0.31)			-0.71** (0.32)	-.60* (0.31)			-0.78** (0.31)	-.68** (0.30)
Africa dummy			-0.92*** (0.17)	-0.88*** (0.17)			-1.39*** (0.23)	-1.27*** (0.23)			-1.43*** (0.24)	-1.31*** (0.23)			-1.56*** (0.26)	-1.44*** (0.25)
"Other" continent dummy			0.22 (0.39)	0.10 (0.39)			1.24** (0.57)	0.88 (0.56)			1.09* (0.58)	0.72 (0.57)			0.93 (0.58)	0.58 (0.57)
R^2	0.52	0.56	0.69	0.71	0.001	0.21	0.50	0.56	0.001	0.21	0.50	0.56	0.003	0.21	0.52	0.58
Number of observations	64	64	64	64	53	53	53	53	53	53	53	53	53	53	53	53

Dependent Variable: HDI Score, 1995-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Property Rights (ICRG), 1985-1995	0.09*** (0.12)	0.08*** (0.01)	0.06*** (0.01)	0.06*** (0.01)												
Property Insecurity Weighted, 1985-1995					0.0005 (0.12)	0.002 (0.11)	0.05 (0.71)	0.04 (0.070)								
Property Insecurity Max, 1985-1995									0.005 (0.06)	0.01 (0.05)	-0.04 (0.04)	-0.04 (.04)				
Property Insecurity Mean, 1985-1995													0.08 (0.08)	0.08 (0.07)	-0.08 (0.05)	-0.08 (0.05)
Latitude		0.21 (0.14)		0.05 (0.10)		0.51*** (0.17)		0.20* (0.12)		0.51*** (0.17)		0.21* (0.12)		0.51*** (0.17)		0.20* (0.12)
Asia dummy			-0.12*** (0.04)	-0.11*** (.04)			-0.12** (0.05)	-0.11** (0.05)			-0.11** (0.05)	-0.10** (0.05)			-0.13*** (0.04)	-0.12** (0.04)
Africa dummy			-0.22*** (0.03)	-0.22*** (0.03)			-0.29*** (0.03)	-0.28*** (0.03)			-0.30*** (0.03)	-0.28*** (0.03)			-0.31*** (0.04)	-0.30*** (0.04)
"Other" continent dummy			0.02 (0.06)	0.02 (0.06)			0.17** (0.08)	0.14 (0.08)			0.15* (0.08)	0.11 (0.08)			0.13 (0.08)	0.09 (0.08)
R^2	0.47	0.49	0.76	0.76	0.00	0.15	0.66	0.68	0.0002	0.15	0.66	0.68	0.02	0.17	0.67	0.69
Number of observations	64	64	64	64	53	53	53	53	53	53	53	53	53	53	53	53

Notes: Dependent variables are log GDP per capita (PPP) in 1995 and the Human Development Index score from 1995 to 2000; property rights (ICRG) is the 0 to 10 scaled version used by Acemoglu, Johnson, and Robinson (2001, 2002) where a higher score means more protection against expropriation; property insecurity weighted is the sum of minority group insecurity weighted by the group's proportion of the population; property insecurity max is the property insecurity score for the worst-off group in a country; property insecurity mean is the unweighted average of group property insecurity scores; higher property insecurity scores indicate higher levels of property insecurity (the inverse of the ICRG Property Rights indicator); the omitted continent dummy is for America; base sample includes countries with data for settler mortality and all variables; all property insecurity scores are logged to base e. Standard errors in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

The Acemoglu, Johnson, and Robinson (2001) article is well-known not for its finding of a simple correlation between expropriation risk and per capita income, as such a correlation could be explained by reverse causality and omitted variables, but because it used settler mortality as an instrumental variable to predict institutional quality, in an attempt to avoid these endogenaity problems.[1]   Arguing that low settler mortality rates and sparse pre-colonial populations encouraged settlers to replicate European institutions with strong private property rights and checks against government power—while colonial disease environments and factor endowments that favored the establishment of extractive industries generated higher degrees of inequality, less accountable political institutions, and ultimately less secure property rights for the majority of the population—Acemoglu, Johnson and Robinson (2001) show a strong and significant relationship between settler mortality and the ICRG Property Rights indicator.

The two-staged least squares estimates used by Acemoglu, Johnson and Robinson (2001) treat property rights security, P_i, as endogenous, and are model as

$$1^{st} \text{ Stage:} \qquad P_i = \alpha + \beta log M_i + \mu X_i + \epsilon_i \text{,,} \qquad\qquad (2)$$

$$2^{nd} \text{ Stage:} \qquad log\ y_i = \alpha + \beta P_i + \mu X_i + \epsilon_i \qquad\qquad (3)$$

where *M* is the settler mortality rate and X_i is a vector of covariates.

The theoretical relationship underlying this instrumental variable strategy suggests that settler mortality rates should also predict the Property Insecurity of ethno-cultural minorities. Theoretically, settler mortality rates are thought to effect institutions through the structure of production, where high settler mortality rates favored the establishment of extensive extraction economies that relied on concentrated capital and the employment of low-skilled workers— ultimately producing property rights institutions that favored elites—while low settler mortality

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[1] For critiques of this instrumental variable strategy, see Albouy (2004), disputing the validity of the settler mortality data; McArthur and Sachs (2001), arguing that settler mortality fails to meet the exclusion restriction because disease environment impacts development directly; and Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2004), contending that education and culture drives development rather than institutions and the density of European settlement is correlated with these factors.

led to broadly egalitarian land distribution and small scale self-employment—which ultimately engendered the widespread enjoyment of secure property rights.

I re-estimate the first-stage of this instrumental variable relationship using Property Insecurity as the property rights measure, based on the original settler mortality data (Acemoglu, Johnson and Robinson 2001). Results are shown in Table 6, Panels C-E. In almost all specifications the first-stage relationship between settler mortality and property rights disappears when we substitute in any measure of Property Insecurity, and in the models where the relationship is statistically significant the sign is the opposite of what we would expect if low settler mortality rates indeed facilitated the widespread enjoyment of property rights security by everyone, including marginalized minority groups.

Table 6. AJR Sample: IV Regressions of Log GDP per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Panel A: Two-Stage Least Squares																
Expropriation Risk (ICRG)	0.93***	0.96***	0.97***	1.07***												
	(1.54)	(0.21)	(0.28)	(0.42)												
Property Insecurity Weighted					16.61	11.70	4.80**	3.82**								
					(11.85)	(7.60)	(2.15)	(1.77)								
Property Insecurity Max									7.93	5.38	5.27	4.24				
									(5.80)	(3.48)	(4.76)	(3.84)				
Property Insecurity Mean													14.00	10.42	1230.25	283.45
													(12.11)	(8.59)	(156134.8)	(10106.02)
Latitude		-0.42		-0.99		3.65		1.85*		3.97		1.78		3.16		6.96
		(1.27)		(1.60)		2.70		(1.11)		(2.70)		(2.19)		(3.45)		(195.98)
Asia dummy			-1.00***	-1.10**			-0.58	-0.52			-2.09	-1.73			40.44	9.10
			(0.38)	(0.48)			(0.50)	(0.43)			(1.55)	(1.28)			(5230.66)	(349.26)
Africa dummy			-0.47	-0.45			-1.44***	-1.32***			(-0.35)	-0.44			365.39	83.54
			(0.34)	(0.39)			(0.36)	(0.31)			1.18	(0.96)			(46548.08)	(3023.70)
"Other" continent dummy			-0.92	-0.95			1.69*	1.26			4.00	3.13			553.84	127.29
			(0.81)	(0.91)			(0.90)	(0.79)			(3.08)	(2.56)			(70137.99)	(4508.67)
R^2	0.19	0.14	0.23	0.06	..	..	..	0.06	..	..	..	..	..	..	..	..
Number of observations	64	64	64	64	53	53	53	53	53	53	53	53	53	53	53	53
Panel B: First Stage for Average Protection Against Expropriation Risk, 1985-1995																
Log European Settler Mortality	-0.61***	-0.52***	-0.44**	-0.35*												
	(0.13)	(0.14)	(0.17)	(0.18)												
Latitude		2.01		2.00												
		(1.33)		(1.38)												
Asia dummy			0.33	0.47												
			(0.50)	(0.50)												
Africa dummy			-0.27	-0.26												
			(0.41)	(0.41)												
"Other" continent dummy			1.23	1.05												
			(0.84)	(0.84)												
R^2	0.27	0.30	0.31	0.33												
Number of observations	64	64	64	64												

Continued on next page

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Panel C: First Stage for Property Insecurity Weighted, 1985-1995																
Log European Settler Mortality					-0.03 (0.02)	-0.04 (0.03)	-0.08** (0.03)	-0.09*** (0.03)								
Latitude						-0.18 (0.24)		-0.17 (0.25)								
Asia dummy							-0.06 (0.09)	-0.07 (0.09)								
Africa dummy							0.11 (0.07)	0.11 (0.07)								
"Other" continent dummy							-0.27 0.17	-0.25 (0.17)								
R^2					0.04	0.05	0.14	0.15								
Number of observations					53	53	53	53								
Panel D: First Stage for Property Insecurity Max, 1985-1995																
Log European Settler Mortality									-0.07 (0.05)	-0.09 (0.05)	-0.07 (0.06)	-0.08 (0.07)				
Latitude										-0.44 (0.51)		-0.14 (0.51)				
Asia dummy											0.23 (0.18)	0.23 (0.18)				
Africa dummy											-0.10 (0.15)	-0.10 (0.15)				
"Other" continent dummy											-0.68* (0.34)	-0.67* (0.35)				
R^2									0.04	0.05	0.18	0.19				
Number of observations									53	53	53	53				
Panel E: First Stage for Property Insecurity Mean, 1985-1995																
Log European Settler Mortality													-0.04 (0.03)	-0.05 (0.04)	-0.0003 (0.04)	-0.001 (0.04)
Latitude														-0.15 (0.36)		-0.02 (0.34)
Asia dummy															-0.03 0.12	-0.03 (0.12)
Africa dummy															-0.30*** (0.10)	-0.30*** (0.10)
"Other" continent dummy															-0.45* (0.23)	-0.45* (0.23)
R^2													0.01	0.03	0.24	0.24
Number of observations													53	53	53	53

Notes: All Property Insecurity scores are logged to base e. ***, ** and * represent significance at the 1%, 5% and 10% levels respectively. Instrumental variable is settler mortality from AJR (2001).

The three Property Insecurity indices reflect the institutional framework experienced by marginalized minorities, while the ICRG and Heritage Foundation Property Rights indices measure the property security of foreign investors and domestic elites. The divergent results in both the GLS and IV specifications using these different indices confirm that they are measuring distinct dimensions of property rights security, corroborating the existence of heterogeneity in property rights enjoyment between groups within countries.

These findings also confirm the hypothesis that the relationship between property rights and economic development depends on whose property rights are secure, and that the security of property rights for marginalized minorities is irrelevant for long-run economic development. Economic growth can occur when the property rights of elites and foreign investors are secure but vulnerable minorities face high a risk of expropriation, possibly because resources are being reallocated into the hands of investors with better access to complementary production inputs. Moreover, if one pathway through which secure private property rights leads to economic growth is by increasing government accountability – as the "macro" theories regarding liberty, secure property rights, democracy, and public goods provision suggest – then the findings here also indicate that a more nuanced understanding of the role played by private property rights in constraining the power of elites is required. Because the ICRG index measures the security of property of elites and large investors, while the Property Insecurity Index is sensitive to the risk of expropriation faced by less powerful ethno-cultural minorities, one might predict that Property Insecurity would be a more appropriate proxy for constraints on elites than the ICRG measure. However, the absence of a relationship between Property Insecurity and long-run economic development indicates that secure property rights for ethno-cultural minorities are not necessary for the kind of government accountability incentivizes the adoption of growth-enhancing economic policies.

5 Conclusion

""I haven't time to tell you what emotions we experience in traversing this half-wild, half-civilized country, in which fifty years ago were to be found numerous and powerful nations who have disappeared from the earth, or who have been pushed back into still more distant forests; a country where are to be seen, rising with prodigious rapidity, new peoples and brilliant cities which pitilessly take the place of the unhappy Indians too feeble to resist them. Half a century ago the name of the Iroquois, of the Mohawks, their tribes, their power filled these regions, and now hardly the memory of them remains. Their majestic forests are falling everyday; civilized nations are established on the ruins..."

       --   Gustave de Beaumont, New York, 1830
              Tocqueville in America (Pierson 1938)

The history of development on every continent is rife with examples of the role played by power in determining whose property rights are made secure and insecure under *de facto* legal institutions, and the considerable heterogeneity of property rights security enjoyed by different groups in the same country. Capitalist economic development has often involved the expropriation of property from marginalized groups and the reallocation of these valuable resources into the hands of elites with access to the knowledge and capital necessary for efficient exploitation.

The dispossession of Native Americans from their land was a necessary prerequisite for the expansion of large plantations and the widespread establishment of small freehold farms for white settlers throughout the United States in the 18th and 19th centuries. Approximately 100,000 Native Americans had their eastern homelands seized during the 19th century (Thornton 1984). The Cherokee, Chickasaw, Choctaw, Creek and Seminole suffered wholesale legal expropriation, and were forcibly removed to marginal land by the Indian Removal Act of 1830. 14,000 Cherokee men, women, and children were marched overland, at gunpoint, by the U.S. Army in the summer of 1938. 4,000 died from inclement weather, mistreatment by soldiers, inadequate food, and disease (Thornton 1984). The widely lauded secure private property rights enjoyed by yeoman American farmers in the 19th century (Engerman and Sokoloff 1997, 2002) were made possible by the property insecurity of Native Americans.

The enclosure of the commons in 17th century Britain—broadly acknowledged to have reduced overgrazing and increased agricultural investments on newly enclosed land— improved the property rights security of the landed elites but reduced the property rights of small and medium cottagers who previously had rights to the newly enclosed commons (Yelling 1977, Sharman 1989). Increasing the security of private property rights for the gentry required expropriating the property of small hold farmers and pastoralists. As Davis (2004) notes, property rights security for some actors entailed property *insecurity* for others.

The criminal law of 18th century Britain further strengthened the property rights claims of landed elites and eroded customary use rights traditionally enjoyed by laborers and yeomen. The Black Act of 1723 created 50 new capital offenses punishable by hanging, directed at "crimes" such as deer stealing, breaking the heads of fishponds, and cutting down young trees (Thompson 1975). The complex web of usufruct rights in the forest – in which the rights to harvest trees and berries, hunt deer, and clear land for agriculture were shared among many parties and determined by season and status[2] – was crystallized into clear-cut freehold titles that vested in the landed gentry (Thompson 1975). By redefining crimes as an offense against property, rather than against another person, the Black Act allowed law to cloak itself in impartiality – masking the power relations underlying the allocation and enforcement of property rights entitlements.

In the contemporary context, Brazil is a well known example of an upper middle income country with a high level of property insecurity for marginalized groups but also strong property rights protections for elites and foreign investors. Brazil's GDP per capita in 2005 was US$8505 (PPP), while its ICRG Property Rights score (1985-1995) was 7.9— higher than the world mean of 7.06—while its Property Insecurity Mean and Property Insecurity Max scores for the same period also both fell in the upper 50th percentile. Brazil currently obtains between 75 and 90 percent of its energy from hydroelectric

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[2] See Maine (1861) for the canonical description of the progression of Western law from status to contract ("Not many of us are so unobservant as not to perceive that in innumerable cases where old law fixed a man's social position irreversibly at his birth, modern law allows him to create it for himself by convention…"). Henry Maine, *Ancient Law* (1861).

power (PBS, n.d.)—a production structure that requires the construction and operation of hydroelectric dams for continued growth. Since 1985, over 50,000 indigenous and local residents have been displaced and resettled due to dam construction, with a majority of resettled households left worse-off than they had been prior to dam construction (Scudder and Gay 2005). The process of aggregate economic growth and simultaneous property insecurity for marginalized minorities in Brazil is ongoing. In 2010 the government approved construction of the world's third largest hydroelectric power plant on the Xingu River, a large tributary of the Amazon. Projected to generate 11,000 megawatts, the Belo Monte dam will provide power for Brazil's fast-growing economy while displacing approximately 20,000-40,000 indigenous Amazonian Indians (PBS, n.d.).

The complexity of property rights has been inadequately considered in recent macro-level research regarding property rights and economic development. Property rights have instead been conceptualized in a formal rather than a realist framework, based on the implicit assumption that rights enjoyment is uniform across a society. The cross-national indices of property rights widely used in the economics research literature—initially designed to assess the risk of expropriation faced by international businesses—fail to adequately account for the institutional framework encountered by marginalized minority groups.

In fact, as this paper shows, members of marginalized groups often face significantly higher property insecurity than foreign investors and domestic elites. In many countries strongly secure property rights for some coexists alongside insecure property rights for others. Existing research ignores the significant variation in the risk of expropriation faced by different ethnic, cultural, and religious groups in the same country.

Although it has been widely argued that secure private property rights are a prerequisite for economic development, it actually matters *whose property rights are secure*. When heterogeneity in property rights enjoyment is considered, the results demonstrate that property insecurity of marginalized minorities does not reduce long-run growth. These findings are important and thought provoking as they challenge widely held assumptions regarding the relationship between property rights and economic development. At a micro-level, growth can occur when the property rights of elites are secure but marginalized minorities face high a risk of expropriation, because resources may be reallocated into the hands of investors with access to knowledge, capital, and

other complementary production inputs. And at a macro-level, secure property rights for marginalized minorities are not required to incentivize governments to adopt broadly growth-enhancing economic policies, as security of property rights for elites can increase accountability of governing elites towards other elites with divergent interests, while broad but not universal property rights security can generate accountability of public officials to the majority.

These findings suggest that if broadly inclusive economic development is the goal, then aggregate growth is an incomplete and possibly inappropriate measure of success in achieving this objective.

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