Deforestation and Property Rights: A Comparison between Former British and Spanish Colonies

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Abstract

According to the United Nations Food and Agriculture Organization changes in the land use of many developing countries have resulted into a rapid process of deforestation in tropical areas during the 80s and 90s. The impact of insecure ownership and badly defined property rights on deforestation has been extensively studied. It is argued that open access resources are typically subject to a more than optimal extraction rate, which is also known as “The Tragedy of the Commons.” This paper first explains how institutions such as property rights have influenced land use. Then, the paper compares the British and Spanish colonial systems in terms of property rights and their different impact on forest management. Finally, the paper concludes that, according to the empirical results, stronger property rights encourage less deforestation controlling for a number of variables. At the same time, the empirical evidence suggests that former British colonies do relatively better than former Spanish in terms of avoiding deforestation.

Resumen

Según datos de la FAO, los cambios producidos en el uso de la tierra en muchos países en vías de desarrollo han dado como resultado un rápido proceso de deforestación en áreas tropicales durante los anos 80 y 90. El impacto ocasionado por la existencia de la propiedad incierta y la mala definición de los derechos de la propiedad han sido causas extensamente estudiadas en el caso de la deforestación. Se apunta a que los recursos de libre acceso están típicamente sujetos a un ritmo de extracción por encima del nivel optimo, lo que se conoce como la "Tragedia de los Comunes". Este articulo explica en primer lugar como (una coma a.C., en la primera O) conceptos tales como los derechos de la propiedad han influido en el uso de la tierra. En segundo lugar, el articulo compara los sistemas coloniales británicos y españoles en cuanto a los derechos de la propiedad y su diferente impacto en la gestión forestal. Finalmente, el articulo concluye que, de acuerdo con los datos empíricos, aplicar unos derechos de la propiedad mas estrictos conlleva una menor deforestación, controlando un numero de variables. Al mismo tiempo, los datos empíricos sugieren que las antiguas colonias británicas son mas eficaces que las españolas en evitar la deforestación.

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Introduction

According to the United Nations Food and Agriculture Organization (FAO 1997) changes in the land use of many developing countries have resulted into a rapid process of deforestation in tropical areas during the 80s and 90s. The impact of insecure ownership and badly defined property rights on deforestation has been extensively studied. It is argued that open access resources are typically subject to a more than optimal extraction rate, which is also known as "The Tragedy of the Commons."(Ostrom 1990) Several models have been developed to illustrate how the myopic actions of agents do not consider the negative externalities that their activity imposes on other individuals (Gordon 1954, Dasgupta and Heal 1979).

Alston et al. (2004) define property rights in land as "the set of formal and informal rights to use and transfer land." According to the authors, property rights range from open access to common arrangements to private property rights. Furthermore, the greater exclusivity of property rights the greater incentive to maintain or even improve the value of land. In the case of forest management, property rights to forests in frontier areas are rarely established of enforced. Consequently, deforestation as a result of open access can be excessive. Schneider (1995), Mendelsohn (1994), Mahar (1989) have modeled such situations of frontier land use. For example, Mendelsohn argues that lack of enforcement of property rights, or higher expropriation risk, discourages investment in standing forests and also discourages improving the intensity of the land use in agriculture. As a result, colonists choose to clear the land instead of preserving it as forest area. Furthermore, institutional quality indicators on the rule of law and property rights have been found statistically significant in explaining deforestation (Deacon 1994; Bohn and Deacon 2000; Ferreira 2004).

It can be argued that property rights form part of a larger set of institutions (constitutions, judicial system, culture, religion, etc.) which as a whole has an impact on forest management. The quality of this set of "formal and informal rules of the game" (North 1990) has been found to be positively associated with levels of development (Hall and Jones 1999; Easterly and Levine 2002), meaning that poorer countries tend to have relatively lower quality of institutions than richer countries. Moreover, a considerable number of authors suggest that European colonization had an impact on institutions and through those on economic performance. La Porta et.al. (1998, 1999) emphasize the importance of colonial origin (the identity of the colonizer) and the legal origin on current institutions and economic performance. This papers show that the common-law countries and former British colonies have better property rights. Similarly, David Landes (1998) and North (1990) argue that former British colonies prospered relative to former French, Spanish and Portuguese colonies because good economic and political institutions and culture were inherited from Britain.

Acemoglu, Johnson, and Robinson (2001) argue that European colonization strategies had radically different implications for economic development. Areas flourished when Europeans set up institutions that protected private property rights and placed effective constraints on politicians and powerful elites. On the contrary, other regions grew only slowly when Europeans established "extractive institutions." The former areas are associated with countries that belonged to the British Empire and were ruled by "Common Law." The latter are related to countries that belonged to the Spanish or French Empire and were ruled by "Civil Law."

Young (1994) emphasizes that the extractive institutions set up by the colonialists persisted long after the colonial regime ended. He writes "although we commonly described the independent polities as 'new states,' in reality they were successors to the colonial regime, inheriting its structures, its quotidian routines and practices, and its more hidden normative theories of governance". Acemoglu et al.(2001) argue that "In Latin America, the full panoply of monopolies and regulations, which had been created by Spain, remained intact after independence, for the most nineteenth century." Furthermore, Acemoglu and Verdier (1998)

argue that “when the new elites inherit extractive institutions, they may not want to incur the costs of introducing better institutions, and may instead prefer to exploit the existing extractive institutions for their own benefits.”

The two different colonial systems

Forests in British-controlled colonies such as India became the object of formal management around the beginning of the nineteenth century so as to prevent shortages of timber and other commercially valuable forest resources in the subcontinent. “British India’s forests were thus managed for a variety of needs ranging from subsistence requirements for native inhabitants, to regional climate stability, infrastructure development, and commercial demand”(Brandis 1897; Ribbentrop 1900). Colonial rulers sought to gain control over native inhabitants as well as indigenous groups. Both territories and inhabitants were subject to “common law”, which governed the access of people to productive resources and territorial organization (this principle was later applied to “tribes” in British controlled Africa; Madami 1996).

British property rights established local ownership of the forest so that local people (pioneers) had direct control over the forest’s resources. Thus, the British Colonial system provided incentives for joint maximization of the net present value of timber and non timber forest products. In addition, the system promoted the internalization of external benefits that did not accrue to the owner of the land such as conservation of the soil or prevention of floods. Therefore, forest land use value tended to be comparatively higher than a system of ill-defined property rights, consequently encouraging less deforestation.

This is in sharp contrast to the colonial experience in Latin America. The main objective of the Spanish was to obtain gold and other valuables from America. Soon after the conquest, the Spanish crown granted rights to land and labor (the “encomienda”) and set up a complex mercantilist system of monopolies and trade regulations to extract the resources from the colonies. Timber and most valuable non timber forest products were property of the Spanish Crown by royal decree, the non market timber forest products and minor NTFPs were left out for indigenous people who had little incentive to manage it sustainably or efficiently.

Therefore, the Spanish Colonial system intended to extract the main forest resources without building any kind of institutional framework for joint maximization of the total value of the forested land. In other words, externalities were typically not taken into account. This type of arrangement led to divided ownership over the same piece of land, which implied a conflict in forest management. For example, foreign tree species were planted in order to maximize the value of the timber produced, however the value of NTFP was decreased considerably. The value of forested land tended to be lower than in the British case, which provided a rationale for clearing the forest. After colonial independence, government took over the ownership of the resources, however the control was in hands of a powerful elite who was giving land concessions to the military. Hence, land and forests were not allocated to the most efficient agents. Nowadays, the situation in Latin America has not changed according to Jaramillo et.al.(1997): “To make matters worse, policies establishing that trees (i.e.,”vuelo”) are public resources standing on private lands encouraged excessive forest exploitation. Such policies have artificially reduced private efforts to manage forests sustainably while inducing rapid conversion to uses that are often less valuable from a social standpoint.”

Other variables affecting deforestation

Before turning to the econometric modeling approach for testing my hypothesis, I would like to emphasize a considerable number of variables that have been utilized as control variables in several studies. I argue that these control variables have an impact on the value of land for different uses. According to Amsberg (1998) "Land use for forestry is preferred if the social opportunity cost in alternative land use (usually agriculture) is smaller than or equal to the marginal value of land in forestry production minus the associated costs of conversion."

The existence of an Environmental Kuznets Curve (EKC) for deforestation has been studied on empirical grounds with mixed results: Cropper and Griffiths (1994) find support for this inverted-U shaped relationship between income and deforestation, whereas Shafik and Bandyopadhyay (1992) do not. There are two potential explanations for this relationship, the positive income elasticity of demand for conservation and the association between rural poverty levels and resource degradation. It seems that there may be a threshold from which the forest value is much higher than the agricultural land value.

The population approach argues that deforestation may reflect both a growing demand for food production and a demand for income earning activities due to demographic pressure. Under this pressure, the value of forests normally decreases with respect to agriculture, hence more deforestation will occur.

In addition to population pressure on agriculture, studies by Barbier (1997) and Southgate (1990a) find a negative correlation between agricultural yields and deforestation rates. This indicates that there is a strong link between productivity performance in agricultural areas and pressures to convert forest frontier areas into cropland. It can also be argued that policies that affect the productivity of the agricultural crops (agricultural subsidies, foreign exchange policies) will eventually have an impact in land use changes.

I would also like to control for the price of timber, although the direct effect is not clear cut. In one view, lower log prices reduce logging profits and the incentives for logging and hence reduce deforestation. In the opposing view, lower log prices reduce the profitability of forestry and hence encourage the conversion of forestlands to other uses such as agriculture (see Vincent 1990; Brandon and Ramankutty 1993).

Transportation costs constitute an important factor in land use value. Studies have confirmed the strong link between road construction and deforestation in several countries (Alston et al., 1995). It can be also said that road building can change land use patterns by making remote forest areas accessible for agriculture. An alternative measure to control for transportation costs can be distance to coastline.

Similarly to transportation costs, locational conditions can affect the value of a forest in comparison to agriculture. For instance, soil quality, latitude, or water flows.

Finally, a considerable number of authors argue that freer trade will encourage forest resource overexploitation through several mechanisms (Ferreira 2004, Chichilnisky 1994, Sampson 2000).

The econometric modeling approach

The model: $F_i=X_1\beta_1+X_2\beta_2+\varepsilon_i$ i=country observation ε_i=error term

$$X_1\beta_1= \alpha + \rho * Prop_i + \varsigma * British_i + \tau * (British_i*Prop_i)$$

F_i is the variable to be studied. It measures the percentage change in forest cover from 1990 to 2000, which is a proxy for deforestation taken from the FAO.

X_1 is the vector containing the independent variables that I will use to test my hypothesis. The first variable $Prop_i$ is the rule of law, a proxy for the risk of expropriation of property rights, taken from the World Development Indicators. A priori, the expected sign is positive, meaning that lower risk of expropriation leads to lower deforestation, ceteris paribus. The variable $British_i$ is a dummy variable which has a value of 1 for a former British colony and 0 for a former Spanish colony. I will adopt the classification of colonial origin suggested by La Porta et.al. (1999). According to my hypothesis, the sign of this variable is positive. The variable $British_i*Prop_i$ is an interaction variable constructed by the combination of the two former variables. Again, the sign of this variable is expected to be positive.

X_2 contains the remaining control variables. In order to control for the EKC, I will include income and income squared using GDP per capita measured in constant dollars of 2000 (WDI). In order to account for the "population approach," I will control for population density per square meter or the rural population as a percentage of the total population (WDI). In order to measure the possible difference between agriculture land and forest land, I will control for the value of agricultural production using the crop production index (FAO). I will try to control the price of timber by using the value of roundwood exports in $1000 (FAO). Although, it is not a perfect measure of prices, I will try to control for price effects on deforestation, similarly to Ferreira (2004). Finally, I will include a measure of trade openness through a variable containing the value of exports and imports as a percentage of GDP (WDI).

The observations for the variables are for the year 1990, except the rule of law which is from 1996 (the first year the index was constructed). The number of countries that will be studied is 47 (27 former British colonies and 20 former Spanish colonies). Given the lack of time series data on forest cover change, I will execute a simple cross country OLS regression.

At the same time, I will run another OLS regression increasing the sample size by including former French colonies (25 observations). Given that our previous sample is small (47 observations), it is likely that the coefficients will not be significant because of low explanatory power. Hence, I want to potentially solve for this problem. Moreover, I will create a dummy variable for former Spanish colonies and an interactive variable composed of the dummy for Spanish and the measure of property rights. The appendix provides details about the selected variables and tables with regression results.

Regression results

I will comment the results of the model that tries to capture the effect of property rights and colonial origin on deforestation rates from 1990 to 2000.

In the first regression (table 2), I find the property rights measure significant at 1% (4), 5% (2) and 10% (1 and 4) level. According to the estimates, stronger property rights encourage forest conservation for the sample of British and Spanish colonies. It is worth noting that in regressions (3) and (6) the property rights index is not significant because it is highly correlated with income per capita and trade, and the interactive Brit*Prop respectively.

The British dummy is only significant at 5% in regression (8). The sign of the dummy is as expected; a British colony will do relatively better than a Spanish colony in terms of preserving the forest resources. Even though, the dummy is not significant in the other regressions (4,5,6 and 7), I will run two regressions with British and Spanish sample separately. The results are in table 3. It can be inferred that there is a significant relationship (5%) between stronger property rights and lower rates of deforestation in British colonies, whereas Spanish colonies do not experience this relationship.

The interactive variable is correlated with property rights index and income per capita. It becomes significant at 5% level in regression 8. Thus, it can be argued that British origin has a direct effect on forest conservation and also an indirect effect through property rights. In other words, a country with strong property rights will preserve forests even better if it has British origin.

Regressions 2, 5 and 8 have the highest explanatory power. In regression 8, both the slope and intercept effects of the British dummy are significant at 5%. Regression 7 constitute a case of multicollinearity, further showing that income per capita and trade openness are not significant. Regarding the rest of the control variables, rural population density is significant at 5% (2 and 8) confirming the population approach, the higher the population in rural areas, the more trees cut down in frontier areas. The value of exports of industrial roundwood is not significant; however the estimated sign is negative. Finally, the crop production index is not significant at 10%; but the negative sign predicts that the higher agricultural productivity is the higher area of forests will be converted into cropland.

In the second regression (table 5), the property rights index is even more highly significant across the seven regressions. This might be a result of increasing the sample size, thus a better explanatory power. In regression 6 I test the hypothesis about the coefficients of British and Spanish dummies being significantly different from each other. I cannot reject the null hypothesis of equal coefficients at 5% level (Fstat 0.68). Similarly, I test the same hypothesis with the interaction variables Brit*Prop and Span*Prop. Again, I cannot reject the null hypothesis of equal coefficients at 5% level (Fstat 0.18). Even though, I cannot prove my hypothesis through these regressions, I suspect of multicollinearity between the variables. Thus, I claim again to refer back to Table 3, in which we did find a significant difference. Furthermore, I could rank the strength of the impact of property rights on forest management as being British strongest, French second and Spanish the last.

Regarding our control variables we find similar results as in Table2. Trade openness and the value of timber exports are not significant. The rural population level is significant at 1% and it again exerts a negative impact in forest conservation. The crop index is not significant, however it has more explanatory power than before and the estimated sign is as expected. The last variable that does change from our previous regression analysis is income and income squared. The sign and significance of income squared may suggest the existence of the so called Environmental Kuznets Curve in deforestation.

Lastly, it is important to do a critic exercise and consider that FAO acknowledges that the quality of primary data available on forest resources remains very poor. Thus, FAO's latest estimates of forest area and change over time are often based on projections and expert opinion and thus remain educated guesses.

The statistical validity of this level of sampling has been strongly challenged (e.g. Tucker and Townshend, 2000). Even if the sample results can legitimately be extrapolated to the tropical region as a whole, they cannot be used as the basis for individual country estimates.

Conclusion

The aim of this paper was to shed light on a possible causal relationship starting from colonial origins, to property rights to deforestation. The empirical evidence suggests that property rights alone can be a determinant of deforestation rates. However, the link between colonial origin and forest conservation seems to be significant as well. Indeed, we also find evidence that colonial origin has an effect on forest management through property rights. We also find a negative relationship between change in forest area and rural population density, and crop production intensity. The impact of income on deforestation is not entirely clear; a deeper statistical analysis is needed.

APPENDIX

British Colonies: Angola, Bangladesh, Botswana, Gambia, Ghana, India, Israel, Jamaica, Kenya, Liberia, Malawi, Malaysia, Namibia, Nepal, Nigeria, Papua Nueva Guinea, Pakistan, Sierra Leone, South Africa, Sri Lanka, Sudan, Tanzania, Thailand, Trinidad and Tobago, Uganda, Zambia, Zimbabwe.

Spanish Colonies: Argentina, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Philippines, Uruguay, Venezuela.

French colonies: Algeria, Burkina Faso, Cameroon, Central Afr. Rep., Chad, Congo, Ivory Coast, Egypt, Guinea, Guinea-Bissau, Indonesia, Jordan, Kuwait, Lebanon, Libya, Madagascar, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Togo, Tunisia, Yemen.

Forest Cover Change Rate: Natural forest area, percent change from 1990 to 2000 includes the total percent change in natural forest area from 1990 to 2000. FAO defines a natural forest in as a forest composed primarily of indigenous (native) tree species. Natural forests include closed forest, where trees cover a high proportion of the ground and where grass does not form a continuous layer on the forest floor (e.g., broadleaved forests, coniferous forests, and bamboo forests), and open forest, which FAO defines as mixed forest/grasslands with at least 10 percent tree cover and a continuous grass layer on the forest floor. Tree height at maturity should exceed 5 meters.

Property Rights: the extent to which the government protects and enforces laws that protect private property, the probability that a government will expropriate private property and the country's legal protection to private property.

GDP per capita, PPP (constant 2000 international $): GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2000 international dollars.

Rural population (% of total population): Rural population is calculated as the difference between the total population and the urban population.

Crop production index (1999-2001 = 100): Crop production index shows agricultural production for each year relative to the base period 1989-91. It includes all crops except fodder crops. Regional and income group aggregates for the FAO's production indexes are calculated from the underlying values in international dollars, normalized to the base period 1989-91.

Trade (% of GDP): Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.

Table 1: Summary of Variables (Number of Observations: 47, Year: 1990)

Variable	Measurement	Mean	Std Dev.	Source
Forest cover change rate	Annual average change from 1990 to 2000	-.827	1.61	FAO
Property Rights	Scale -2.5 to 2.5 (strong property rights) for 1996	-.229	.645	WDI
British	1 if former British colony; 0 otherwise	.574	.499	
British*PropRights	Interaction variable	-.124	.54	WDI
Per Capita GDP	Constant 2000 $ US (PPP)	1525.22	1435	WDI
Per Capita GDP ^2	Constant 2000 $ US (PPP) to the square	4334078	7065158	WDI
Rural population	Rural population as % of total population	55.50	22.38	FAO
Crop Prod Index	Relative to base period 1989-91	79.66	19.49	FAO
Trade Openness	Exports and imports as % of GDP	65.17	36.59	WDI
Value of timber exports	Value of exports per 1000$	41847.47	220386.4	FAO

Table 4: Summary of Variables (Number of Observations: 71, Year: 1990)

Variable	Measurement	Mean	Std Dev.	Source
Forest cover change rate	Annual average change from 1990 to 2000	-.670	1.594	FAO
Property Rights	Scale -2.5 to 2.5 (strong property rights) for 1996	-.371	.670	WDI
British	1 if former British colony; 0 otherwise	.380	.488	
British*PropRights	Interaction variable	-.087	.466	WDI
Spanish	1 if former Spanish colony; 0 otherwise	.267	.445	
Span * Prop Rights	Interaction variable	-.066	.333	
French	1 if former French colony; 0 otherwise	.352	7065158	
Per Capita GDP	Constant 2000 $ US (PPP)	3191.78	2748.07	WDI
Per Capita GDP ^2	Constant 2000 $ US (PPP) to the square	7334078	11065158	WDI
Rural population	Rural population as % of total population	57.09	22.71	FAO
Crop Prod Index	Relative to base period 1989-91	77.18	17.72	FAO
Trade Openness	Exports and imports as % of GDP	64.57	33.95	WDI
Value of timber exports	Value of exports per 1000$	34814.31	182505.2	FAO

Note: WDI World Bank. *World Development Indicators*. World Bank, Washington DC.

FAO United Nations Food and Agricultural Organization. *FAOSTAT Production Yearbook*.

Table 2: Regression output 1.

Dependent Variable: Forest cover change 1990-2000							**Method: Least Squares**	
Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Property Rights	1.018***	.889**	0.334	1.02***	.72*	.89		
	(2.99)	(2.43)	(0.65)	(2.97)	(1.91)	(1.46)		
Rurpopdensit		-.021**	-.01				-.006	-.04***
		(-1.99)	(-.07)				(-.26)	(-3.18)
Crop Prod Index		-.010	-.017				-.0161	-.014
		(-.96)	(-1.44)				(-1.23)	(1.29)
British				-.172	.891	-.126	.388	1.24**
				(-.39)	(1.54)	(-.26)	(.49)	(2.28)
British*PropRights						.194	0.337	.919**
						(.26)	(.46)	(2.15)
GDP per capita			.0003				0.003	
			(0.99)				(1.12)	
Trade Openness							-.0012	
							(-.14)	
Timber export value		-1e-06			-1e-06		-9e-07	-1e-06
		(-1.01)			(-1.25)		(-.80)	(-1.38)
Constant	-.594**	1.45	.061	-.494	1.839	-.526	.073	2.02
	(-2.57)	(1.26)	(0.03)	(-1.43)	(-1.58)	(-1.42)	(.04)	(0.086)
Observations	47	47	47	47	47	47	47	47
Adjusted R squared	.147	.195	.09	.13	0.22	0.169	0.03	.23
F statistic	8.94***	3.79***	1.85	4.46**	3.61***	2.93**	1.23	3.86***

Note: *** Statistically significant at 1% ** Statistically significant at 5%
* Statistically significant at 10%

Table 3: Regression output 2.

Dependent Variable: Forest cover change 1990-2000					**Method: Least Squares**	
	British Colonies		**Spanish Colonies**		**French Colonies**	
Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Property Rights	1.085***	.943**	.89	.621	1.671***	1.042*
	(2.84)	(2.29)	(1.30)	(.63)	(3.17)	(1.84)
Rurpopdensit		-.033*		-.044		-.0346**
		(-1.94)		(-1.57)		(-2.29)
Crop Prod Index		-.009		-.02		-.0316
		(-0.68)		(-.97)		(-1.37)
Timber export value		-1e-06		-0.00002		
		(-1.33)		(-.97)		
Constant	-.653	2.449	-.526	2.969		4.506**
	(-2.36)	(1.24)	(-1.26)	(1.55)		(2.09)
					.502	
					(1.14)	
Observations	27	27	20	20	25	25
Adjusted R squared	.213	0.268	0.086	0.113	0.22	0.273
F statistic	8.07***	3.38**	1.70	1.61	9.05***	10***

Note: *** Statistically significant at 1% ** Statistically significant at 5%
* Statistically significant at 10%

Table 5: Regression output 3.

Dependent Variable: Forest cover change 1990-2000								**Method: Least Squares**
Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Property Rights	.999***	.704***	.631*	1.12***	.733**	1.671***	1.318**	
	(3.85)	(2.63)	(1.80)	(4.23)	(2.60)	(3.24)	(2.22)	
Rurpopdensit		-.026***	-.016		-.031***		-.01	
		(-3.31)	(-.142)		(-3.33)		(-0.73)	
Crop Prod Index		-.012	-.013		-.012		-.013	
		(-1.36)	(-1.04)		(-1.27)		(1.41)	
British				-.79*	-.33	-1.15**	-1.01	-.121
				(-1.93)	(-0.81)	(-2.23)	(-1.60)	(-
British*PropRights						-.644	-.853	0.28)
						(-1.01)	(-1.07)	1.02**
Spanish				-.42	-.87*	-.865	-.981	(2.53)
				(-0.96)	(-1.95)	(-1.55)	(-1.52)	.169
Spanish*PropRights						-.945	-1.02	(0.34)
						(-1.26)	(-1.37)	.726
GDP per capita			-.0002				-.0001	(1.24)
			(-1.04)				(-0.50)	
GDP per capita square			2e-08**				2.6e-08*	
			(2.29)				(1.91)	
Trade Openness								
			-8e-07					
Timber export value			(-0.98)					
	-.299	2.10**	1.72	-.166	2.71***	.502		
Constant	(-1.51)	(2.22)	(1.27)	(-0.50)	(2.69)	(1.17)	1.871	-.532*
							(1.28)	(-1.72)
Observations	71	71	67	71	71	71	67	71
Adjusted R squared	0.164	0.266	.279	0.22	0.285	0.18	0.2732	0.117
F statistic	14.82***	9.46***	5.27***	6.30***	6.60***	4.11***	3.48***	2.20*

Note: *** Statistically significant at 1% ** Statistically significant at 5%
* Statistically significant at 10%

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