Resistance to Colonization and Post-Colonial Economic Outcomes

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Abstract

An extensive literature in development economics has analyzed the relationship between colonial institutions and present-day outcomes for former colonies. However, the actions and reactions of native populations to colonial rule have so far been left out of the narrative. Native groups could choose to cooperate or resist colonization, which would then affect the relationship between the colonizer and colony and subsequently the effects of colonization. This paper studies the relationship between resistance to colonization by the native population and present-day economic outcomes. Former colonies with a history of resisting colonization have 50%-65% lower GDP/capita today, compared to former colonies that were colonized without resistance. This is despite the fact that both historical and economic evidence point to resisting native groups being stronger politically, militarily, and economically than native groups that did not resist prior to colonization. This relationship cannot be explained through the resource curse nor through political institutions typically associated with colonial rule. However, ethnic group functionalization, the use of certain ethnic, linguistic, or religious groups in positions of power within the colonial government, does explain this relationship. While exogeneity cannot be shown, the endogenous causes of resistance are argued to work against the results found here.

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I. Introduction

So far, the story of colonization in the economics literature has largely focused on the colonizers: what their motivations were, what policies they instituted, and the effects their actions had on their colonies. However, colonization did not occur in a vacuum, but instead was enacted upon native populations varying in size, strength, centralization, and motivations of their own. It stands to reason that native populations' reactions to colonization were not uniform: Did they accept their new overlords and cooperate with them? Did they resist colonization and resent the colonizer's presence and power? And furthermore, how did this response affect their relationship with the colonizer, the colonizer's administration tactics, and their eventual outcomes after independence?

This paper studies the relationship between native resistance to colonization in the Imperialistic period and post-colonial outcomes. To do this, I combine an analysis of the economic outcomes of 78 former colonies in Africa, Asia, and Oceania with the historical accounts of colonization in these countries, and find that resistance to colonization is related to a 52% to 63% lower GDP per capita in 2005 even though resistance is associated with economically, politically, and militarily stronger groups. This relationship does not occurr solely through the negative effects of violence and is robust to many potential covariates, such as geographic location, colonizing country, and use of the colony. While I cannot show that resistance is an exogenous shock and thus that the relationship between resistance and GDP today is causal, the historical analysis provides evidence that endogeneity works against the effects found here.

To further understand the relationship between resistance to colonization and present-day GDP, I then consider potential mechanisms through which this relationship could be occurring. I first consider the institutions typically considered as directly impacted by colonialism, specifically democracy, protection from expropriation, and constraints on the executive, and find that none of these explains why resisting colonies have worse outcomes than non-resisting colonies. I then consider additional potential mechanisms, driven by the argument that colonial administration is more difficult when the native group has resisted colonization, so the colonizer could have reacted with instructions specifically designed to dampen further

resistance. Of the institutions analyzed, only ethnic group functionalization, the use of certain ethnic, linguistic, or religious groups for positions in the colonial administration, military, or police, emerges as a potential mechanism. While it is possible that other mechanisms exist to explain this relationship, ethnic group functionalization statistically and logically emerges as a front-runner. Sub-group analysis based on colonizing country further emphasize this point: the negative relationship between resistance and present-day GDP holds for all but French colonies, where the relationship between resistance to colonization and ethnic group functionalization also breaks down. This reversal can be explained by the fact that the French used ethnic group functionalization as an administration tactic in all of their colonies, while Britain and other colonizers had a more indirect colonial administration method that implemented ethnic group functionalization only when necessary to control sub-sets of the population.

This paper contributes to the literature on how colonial institutions affect post-independence outcomes for former colonies. Existing studies find that the colonizing country has a substantial impact on the law system that is eventually used (La Porta et al 1998 & 1999), which ethnic groups have access to the state (Wucherpfennig et al 2016), whether the country develops democratic institutions (Olsson 2009), whether the country experiences civil violence (Lange and Dawson 2009), and generally how economically successful the country is (Grier 1999, Bertocchi and Canova 2002, Feyrer and Sacerdote 2009) post-independence. Malaria risk at colonization is shown to lead to extractive colonial institutions that translate to a lower protection from government expropriation today (Acemoglu et al 2001). Initial factor endowments that support the growth of sugar and cotton are shown to have led to colonial and post-colonial institutions that support inequality and concentrated power among elites (Engerman and Sokoloff 1997). Colonies that received more European settlers developed more unequal (Engerman and Sokoloff 2006) and corrupt (Angeles and Neanidis 2015) colonial institutions that translate to more unequal and corrupt post-independence institutions. Ethnolinguistic fractionalization, caused by colonial policies of dividing lands irrespective of tribal affiliations, is also shown to lead to more corruption (Mauro 1995). Iyer (2010) shows that direct colonial rule negatively affects government provisions and quality in India, compared to indirect

colonial rule, and Broms (2017) shows that greater colonial revenue extraction is correlated with better government provisions and quality in the former British Empire.

My contribution to this extensive literature is two-fold. First, this is the first paper in the economics literature, to my knowledge, to analyze native resistance to colonization and address its impact on the colonial relationship and post-colonial outcomes. Additionally, it identifies ethnic group functionalization as a determinant of economic outcomes. While ethic group functionalization has been identified as a determinant of civil conflict (e.g. Wucherpfennig et al 2016), as far as I am aware it has not yet been identified as a determinant of economic development. While it is analyzed in the context of colonialism here, it is worth considering how ethnic group functionalization that emerges in other contexts, such as military occupation, may also affect economic outcomes.

Additionally, this paper contributes to the literature discussing pre-colonization factors that affect institutions and economic outcomes today. For example, Michalopoulos and Papaiannou (2013) find that regions with pre-colonial institutions that are more complex and centralized are more economically developed post-independence. This paper analyzes whether pre-colonial centralization determines resistance to colonization, and finds that it does weakly correlate with resistance to colonization, but does not generate the relationship found in the paper. This paper also contributes to this discussion the determinants of resistance to colonization through an analysis of the historical circumstances of each colonization and find that pre-colonial intra-regional military security, economic strength, and political stability are positively correlated with and likely led to resistance to colonization.

Additionally, this work contributes to the greater discussion of the effect of armed conflicts on economic development. While many papers find significant negative effects of armed conflicts on economic development (e.g. Ammons 1996, Kang and Meernik 2005, Yamarik et al 2010), these effects tend to be analyzed in the short-run and for civil, rather than inter-state, wars. Additionally, the effects of these conflicts are greatly heterogeneous, with some countries having positive economic effects after armed conflicts (Bove et al 2017). When looking at longer-term effects, however, gaps in economic development

between combatants and non-combatants close or nearly close after 20 years, especially in situations in which combatants are able to maintain peace after conflict and experienced technological growth during the conflict (Organski and Kugler 1977, Koubi 2005, Chen et al 2008, Gates et al 2012, Kim et al 2013, Gardeazabel and Vega-Bayo WP 2016). The time frame analyzed here is greater than those analyzed in this literature: the violent colonization events are typically happening 100 to 200 years before GDP per capita is being measured. Any effects found here are thus much more long-standing than those found in the rest of the literature, and are likely specific to conflict in the colonial environment.

The rest of the paper is as follows: section 2 presents the data used in this analysis; section 3 discusses the historical and institutional setting being analyzed here; section 4 provides the empirical specifications and results showing that resistance to colonization is related to worse economic outcomes post-independence and argues that these results cannot be explained many alternative arguments; section 5 considers potential mechanisms and establishes ethnic group functionalization as a significant contributor to this relationship; and section 7 concludes.

Section II: Data

The dataset used to measure aspects of colonialism is the Colonial Transformation Dataset, described by Ziltener et al (2017). This dataset provides country-level measures of the aspects and effects of colonization for nearly every independent, previously colonized country in Africa, Asia and Oceania[1]. When the country is a conglomeration of multiple independent pre-colonial groups, the measure shows a holistic measurement for all of the groups that now comprise that country. The years of colonization and independence, the colonizing country, the measures of violence at various points in the colonization process, measures of colonial development and extraction, and measures of colonial political change are

[1] Some countries are included in this dataset that may not traditionally be considered colonies. That is because they were protectorates or that the official influence the colonizer had over the region was indirect. However, these countries were still heavily influenced by their European connections and many protectorate treaties included provisions that prevented the protectorate from acting independently, politically or economically, of the protector. Thus, despite the lack of official designation as a colony, there is still reason to consider these places colonies and as being heavily affected by the influence of the country "protecting" them.

drawn from this data set. All of these variables are standardized; for example, violence is measured as a trinary measurement, where 0 means no violence, 1 means moderate violence characterized by a small number of casualties among the native populations, and 2 means massive violence characterized by heavy casualties, persistent conflict, and the purposeful destruction of crops, livestock, and infrastructure.

Resistance to colonization is measured through violence at colonization. As the historical analysis in section 3 will show, violence at colonization proxies for resistance to colonization, where that resistance is determined by the native group, since resistance always led to fighting and violence. Furthermore, robustness checks in section 4 will show that the relationship between resistance to colonization and current economic outcomes only comes through resistance to initial colonization; if the meaningful variation was coming through violence, rather than resistance, later forms of resistance would the equivalent or stronger effects due to their relative recency. Furthermore, previous literature shows that the detrimental economic effects of violent conflicts are typically resolved in 20-40 years (Organski and Kugler 1977, Koubi 2005, Chen et al 2008, Gates et al 2012, Kim et al 2013, Gardeazabel and Vega-Bayo WP 2016), short-lived compared to the time-horizons considered here.

Measurements of GDP per capita in 2005 and population come from the World Development Index. GDP per capita is measured using constant 2011 PPP-adjusted international dollars. Other indicators, such as latitude, come from the dataset of La Porta et al (1999). Table 1 presents summary statistics of the major variables used in this paper and figure 1 presents a map depicting which countries are categorized as having each level of resistance to colonization.

Section III: Institutions in Imperialism

The period of colonization considered here extends from 1506 through 1994. However, the majority of the observed countries were colonized after 1800 in what is considered to be the age of imperialism or the second wave of colonialism. This section provides important context for understanding the conclusions

made in this paper and argues that using violence at colonization as a proxy for resistance to colonization is reasonable given the institutions at the time.

Imperialism arose in conjunction with many changes in the economic, political, and social landscape. The first and second industrial revolutions drove colonizers to secure markets for exports and raw goods and to find outlets for extra capital accumulation (Ohaegbulam 98-104, Ferro 10-13), and demands for labor drove colonization in the West Pacific (Corris 1), from where people were exported to other colonies to work on plantations. Militaristically, colonies were desired for their strategic locations (Ohaegbulam 104-110, Vandervort 30-35, Ferro 101-3), and as countries began to increase their colonial holdings, nationalism-fueled competition increased over the remaining colonizable regions, leading to colonization for the sake of preventing a rival from colonizing the place instead. Additionally, social motivations such as the elimination of the slave trade (Ohaegbulam 112-113, Zhalen xi-xii, Abdullah 38, Stuart-Fox 23) and the common belief in Victorian Europe that people of European descent were inherently superior to people of other races and responsible for "bettering" non-Europeans (Ohaegbulam 103, Ferro 10-13, Parsons 300) rationalized imperialistic actions and provided incentives to colonize regions that may not be economically or militaristically advantageous. This heady mixture of economic, political, and social motivations resulted in desire for and competition over all regions as potential colonies, not just those with obvious economic or political benefits.

This Victorian motivation of "bettering" non-Europeans informs the major difference between the first and second waves of colonialism. First-wave colonialism, where colonizers would enter a place and claim it as their own, killing anyone who disagreed, was no longer politically feasible in the European capitals that were forming imperialistic policies; countries could no longer wantonly destroy a place or a people to colonize it and could not sustain political support to rule these places directly (Johnson 40). Thus, countries had to use the minimum amount of force necessary to overcome and maintain order (Johnson 78-89) and overuses of force had to be justified before the citizens of the colonizing country lest they lose political support (Parsons 292-295). Additionally, international law stated that the leaders of a

"protectorate" region had to sign a treaty with the colonizer for the relationship to be recognized by the international community (Bennett 106). However, it was also politically unpopular to lose territory to a European rival, and thus colonizers used the minimum force necessary to overcome a region and make it a colony, but they used as much force as needed to secure the region as their own colony (Kratoska 4)[2].

Between the motivations for colonization and the political institutions surrounding colonization during the imperialistic period, it does not seem that colonizers were using drastically different levels of force or different colonization strategies when facing colonies of different economic, military, or political benefit. Alternatively, it seems that colonizers used a fairly uniform policy of escalating force, in which they would begin colonization pressure diplomatically, and would progressively increase the level of violence until the native people ceded. Thus, violence at colonization provides a fairly good proxy for resistance to colonization, where resistance to colonization is reflecting choices of the native groups, rather than differing colonization policies.

Section IV: Empirical Specification and Analysis

This section analyzes the relationship between resistance to colonization and present day economic outcomes and tests whether alternative determinants can explain this result. Looking directly to the data, figure 2 shows that countries without resistance to colonization have much higher log GDP per capita in 2005 than countries in which there was moderate or massive resistance. Not only does it appear as though resistance is bad for long-run outcomes; it also seems like the majority of the variation is coming between resistance and non-resistance, compared to different degrees of resistance.

Table 2 further emphasizes this result: countries without resistance to colonization have higher GDP per capita than countries with moderate or massive resistance to colonization. The difference in GDP per capita between countries with moderate and massive resistance is neither large nor significant. However, looking at other variables that could potentially affect GDP per capita in previously colonized

[2] See appendix 1 for details about region-specific colonizing institutions,

countries, one sees many potential covariates that previous research has shown matter for post-colonial economic outcomes. Countries without resistance to colonization were colonized later, are less likely to be in Africa, were more likely to be colonized by Britain, and are farther away from the equator. Because of this, an OLS regression with controls for these covariates is used. Thus, the specification that will be used is

$$\log(y_i) = \beta_0 + \beta^n res_i^n + \gamma^n X_i^n + \epsilon$$

where i is the country, y is GDP per capita, res_i^n is the measure of resistance being used (depending on the measure, it may be a single binary variable or a vector of binary variables), and X^n is a vector of controls. The coefficients β^n are the coefficients of interest, and will show the relationship between resistance at colonization and GDP today.

My main results are presented in table 3. The initial specification regresses log GDP per capita on the trinary measure of resistance/violence at colonization (column 1). These coefficients show that, compared to countries with no resistance to colonization, countries with moderate resistance to colonization have 69.58% lower GDP per capita and countries with massive resistance to colonization have 80.03% lower GDP per capita.[3] These two coefficients are not statistically different at 10%, suggesting that the bulk of the discernable difference is driven by the existence, rather than the intensity, of resistance to colonization. For that reason, a new variable, resistance to colonization, is created, which is 1 when there was resistance to colonization, whether moderate or massive, and 0 otherwise. Regressing log GDP per capita on this binary measure of resistance shows that resistance to colonization of any degree is related to a 76.05% lower GDP per capita compared to no resistance (column 2).

Resistance to colonization may be related to a number of characteristics that could be affecting GDP per capita, as shown in table 2. Countries in Africa on average have lower GDP per capita compared

[3] When interpreting the coefficient of a binary variable on a logged variable, a coefficient of β translates to a $100(e^{\beta} - 1)\%$ change in the non-logged dependent variable.

to countries in Asia and experienced more resistance. British colonies tend to have greater success post-colonization than French colonies or the colonies of other countries (e.g. La Porta et al 1998 & 1999, Grier 1999, Bertocchi and Canova 2002, Feyrer and Sacerdote 2009), and also were less likely to experience resistance to colonization. Countries closer to the equator have poorer economic outcomes than countries further away. Thus, each of these is controlled for in columns 3 through 6 of table 3, including all of them in column 6 of table 3. Adding in these controls decreases the magnitude and significance of the coefficient, particularly when controlling for latitude, though these results are robust to the controls and remain statistically and economically significant. In my preferred specification with all of the controls, having resistance to colonization is related to a 52.15% lower GDP per capita today, a substantial and economically significant difference.

The primary concern here is that pre-existing differences in native population strength may determine both resistance and later outcomes. Specifically, the concern would likely be that economically stronger places pre-colonialism would be less likely to resist colonization, possibly due to a more strategic approach to interacting with outsiders or more previous experience through trade and political interactions, and that comparative strength carried through to present-day economic outcomes. However, an analysis of the history of colonization events shows the opposite is true[4]. The three main motivations for cooperating with the colonization attempt were: the native group was losing in a conflict with neighboring groups, and the colonizer promised protection from those groups; the native group was experiencing internal political strife, such as a potential coup, and the colonizer promised to protect the faction in power from other factions within their own group; and the native group was in serious economic or financial difficulties, such as being in excessive debt to European countries, and the colonizer promised to absolve the debt or fund the group. In all of these cases, the benefits the colonizer promises are in exchange for the native group signing a protectorate treaty and becoming a colony.

[4] See appendix 2 for a set of case studies related to this topic.

Native groups that resisted did so for the opposite reasons. They tended to be the aggressors in the conflicts with neighboring groups and had a history of being successful in these conflicts. They were economically and financially successful, often controlling production and trade in their region. And furthermore, they were politically strong and motivated to not give up their sovereignty. Becoming a protectorate would force these native groups to give up their autonomy, sovereignty, and control of the economic activities in the area. While this is true for the native groups that cooperated as well, those groups that cooperated were also more likely to lose these things without the colonizer's assistance. Additionally, the groups that resisted, as said before, tended to be successful in their previous military campaigns, and saw the colonizer as just another combatant that they would likely defeat as they had defeated their combatants before.

The decision to resist or not comes down to the strength and stability of the native group being approached for colonization: strong, stable groups resisted colonization and weak, unstable groups cooperated with colonization. While colonization meant losing autonomy over political, economic, and military decisions for all groups, for weak groups this autonomy was already tenuous and likely to be lost, possibly more completely than if the colonizer was allowed oversight. This means that for strong groups, the loss associated with colonization is greater, even if both the weak and strong groups would end up with similar amounts of autonomy under colonization[5].

While the analysis of history above has shown that the determinants of resistance to colonization were economic and political strength, rather than weakness, these accounts may be subject to the interpretation of historians. As such, an analysis of pre-colonial economic conditions, measured through population density, as a determinant of resistance to colonization and modern economic outcomes is appropriate. Population density is taken as a measure of pre-industrial or Malthusian economic development because, before industrialization, any increase in total income translated into an increase in population over

[5] A game tree describing the choices and motivations of colonizers and native groups in an game theoretic framework is provided in appendix 3.

which the increased income was then spread (see Ashraf and Galor 2011 and 2013). Economic development thus did not lead to higher income, but greater population density. Population density at 1500 is used because it is before the colonization of every country in my sample, and comes from Ashraf and Galor (2013).

The results of this analysis are presented in column 1 of table 4, which shows that, in the formerly colonized countries of my sample, resistance to colonization was strongly correlated with higher population density, meaning that places with stronger economies were more likely to resist colonization. Additionally, population density in 1500 is negatively associated with GDP per capita today for former colonies in my dataset, while it is positively associated with GDP per capita today for countries outside my dataset (table 4 columns 2-4). Acemoglu et al (2002) also found this effect, describing the reversals of fortune for former colonies; however, their institutional mechanisms for these reversals of fortune cannot explain the results found here, as is shown in section five.

The next concern is that the results seen here are a direct result of the damage associated with violence, rather than a result of resistance. However, other measures of violence and resistance during colonization that exist in the Colonial Transformation Dataset can be useful here in showing that it is not a direct effect of violence. In table 5, log GDP per capita is regressed on all three binarized measures of colonial violence: violence at (or resistance to) colonization, violence against resistance movements (or violence during colonial rule after colonization but before independence), and violence at independence. If the results seen above were coming only through violence, rather than resistance, one should expect later, more recent conflicts to have a greater effect. However, only violence at colonization has a large and statistically significant relationship with log GDP per capita. While violence against resistance movements has a significant effect, it is highly correlated with violence at colonization, and loses its magnitude and significance when regressed together. While there were surely negative direct effects of violence, they were likely short-lived and cannot explain the long-term relationship seen here. This is supported by the existing literature on the economic effects of violent conflicts: the negative effects of violent conflicts tend to

dissipate after 20 years, leaving combatants and non-combatants in similar situations after that amount of time (Organski and Kugler 1977, Koubi 2005, Chen et al 2008, Gates et al 2012, Kim et al 2013, Gardeazabel and Vega-Bayo WP 2016). The timeframe analyzed here is typically over 100 years between the time of conflict and when the economic measures are taken. Thus, it seems like this is unlikely to be causing these results.

Another concern is that the attractiveness of a place as a colony could be confounding the relationship between resistance to colonization and present day GDP that's seen here. This could be occurring because places that had more to offer colonizers may have also had more to offer the native groups, making them stronger and more likely to resist colonization, and former colonies with greater resources were more likely to be subject to extractive institutions by the colonizer. There are a few ways that the attractiveness and use of a colony can be measured with my data. Year colonized or length of colonization can act as proxies for attractiveness of a colony, since places that are more attractive to the colonizer are more likely to be sought first, given the competition among colonizers, and held for longer, since they would be less willing to give up a lucrative, useful holding. Along this line, Grier (1999) and Feyrer and Sacerdote (2009) find that the length of time under colonial rule is positively related to current GDP per capita. Additionally, I can directly measure whether the colony was used for mining or plantation use, which are both indicators of natural resources valuable to the colonizer and indicators of the level of extraction experienced in that colony (Acemoglu et al 2001). Columns 1 and 2 of table 6 shows, however, that this is not the case. While mining use does register as correlated with GDP today, none of the variables discussed above explain the relationship between resistance to colonization and GDP/capita today. The attractiveness and use of the colony are not driving this result.

A fourth concern is that pre-colonial conditions may have affected resistance choices and directly affected long-run economic development. In particular, I focus on pre-colonial political centralization, as places that are more centralized before colonization may be more likely to resist colonization and, as shown through Michalopoulos and Papaioannou (2013), would likely have greater economic development today.

However, looking at column 3 of table 6 shows that pre-colonial centralization also cannot explain the relationship between resistance to colonization and GDP/capita today. Column 4 also eliminates any possibility that it is some combination of these effects.

In sum, resisting colonization is related to lower GDP per capita today, and this relationship cannot be explained by the direct effect of violence, attractiveness or use of the colony, or pre-colonial political centralization. So far, I have not addressed the obvious issue of endogeneity present in these results and have thus discussed them as relationships between resistance to colonization and GDP per capita today, rather than as effects. This is because there are many other potential confounders of resistance and economic development that I cannot, with the data as it exists, explore. However, the endogeneity that exists is going in the opposite direction of the results I'm seeing here. Everything so far has shown that places that resist are stronger pre-colonization than those that cooperate, and if something about that pre-colonial strength should translate to post-colonial outcomes, one should expect resistance to be related to better, not worse, present day outcomes. This comes through two lines of thought: work like that of Michalopoulos and Papaioannou (2013), which suggests that pre-colonial conditions have direct post-colonial implications, such as pre-colonial centralization on post-colonial regional development; and the results of the population density analysis in table 4 show that pre-industrial economic development is positively correlated with present day economic development except in my sample of former colonies, where the relationship is reversed. While this could be seen as an example of a larger trend of reversals of fortune for former colonies, I'll show in the next section that the mechanisms that Acemoglu et al (2002) find as explaining reversals of fortune are neither predicted by nor moderate the effect of resistance to colonization. So while causality beyond the scope of this paper, the endogeneity seems to be working against the relationship I'm showing here.

Section V: Mechanisms

Now that it has been established that countries with native groups that resisted colonization have lower GDP per capita today, and that this is not coming through the direct negative effects of the damage

associated with violence, then that begs the question of why this relationship is occurring. The most obvious place to look for this answer is to the institutions set up by the colonizer for the colony. Once the colonizer has successfully overcome the native groups and gotten them to sign a protectorate treaty, they are then tasked with administering the colony, which would likely be difficult with groups that resisted and resented colonization. Thus, when looking to understand why the relationship between resistance to colonization and long-run economic outcomes exists, I will focus on colonial institutions as a likely source of explanations.

The first set of institutions to consider are those that have already been considered extensively in the literature, which is those of extractive institutions (e.g. Acemoglu et al 2001, Acemoglu et al 2002). These extractive institutions are associated with high taxes and policies that use the native population or imported slaves to extract the natural resources in the region to then be shipped to the colonizing country. This is opposed to settler colonies, in which the colonizing country sends settlers to live in the region and develop it. However, evidence that extractive institutions are not the explanation for this negative relationship have already been presented: as seen in table 6, the use of the colony for mining or plantations, both typically extractive activities, does not explain the relationship seen between resistance and GDP per capita today. Table 7 presents additional evidence, showing that average protection from expropriation, democracy, and constraint on the executive, the present-day institutions that are taken as outcomes of extractive colonial institutions, are neither significantly related to resistance to colonization nor moderate the relationship between resistance to colonization and present-day GDP per capita. Between these two results, it is unlikely that extractive colonial institutions and their post-colonial institutional outcomes are the mechanism through which resistance to colonization is negatively relating to GDP per capita today. Additionally, the latter result provides evidence that the reversals of fortune described by Acemoglu et al (2002) cannot explain the results found here.

Even though extractive institutions cannot specifically explain the relationship found in this paper, that does not mean that other colonial institutions cannot. In considering potential institutions that could

relate resistance to colonization and post-colonial outcomes, one should consider those responses colonizers could have to uncooperative native groups in terms of maintaining order and control in the colony. Three are considered here: ethnolinguistic fractionalization, ethnic group functionalization, and directness of rule.

Ethnolinguistic fractionalization and ethnic group functionalization are both examples of the strategic (mis)use of ethnolinguistic or religious divisions within a colony. Ethnolinguistic fractionalization is the artificial creation of country borders such that they divide otherwise cohesive ethnolinguistic or religious groups or artificially combine disparate ethnolinguistic or religious groups. If the colonizer was having a specific difficulty with a native group, they may have intentionally created divisions within the group to prevent their being able to cooperate and resist the colonizer. Ethnolinguistic functionalization has been shown to be a significant contributor to negative post-colonial outcomes (e.g. La Porta et al 1999, Hall and Jones 1999).

Ethnic group functionalization is the placement of certain ethnic, linguistic, or religious groups into positions of power in the colonial administration, military, or police. This could be done, either intentionally or unintentionally, by colonizers putting cooperative groups into positions of power over uncooperative groups. This would make it easier for the colonizer to administer the colony over the long-run, as it would minimize the degree to which they would have to directly control uncooperative and resisting groups. This is complicated by the fact that many of the native groups that would end up comprising a colony were enemies before colonization and often found themselves in conflict with one another. Ethnic group functionalization, combined with these pre-colonial rivalries, could lead to significant tensions within a country. Colonial ethnic group functionalization has been shown to be a substantial contributor to socio-political conflict today (Wucherpfennig et al 2016).

Colonizers may also have responded to resistance to colonization by exerting a more direct form of colonial rule. Colonizers varied how much direct control they exerted over the daily governance of a colony, and more direct colonial rule could have been necessary for controlling native groups that had resisted colonization and resented its implementation. Ziltener et al (2017) demonstrates that greater

resistance to colonization is related to stronger forms of colonial rule, and Iyer (2010) shows that direct colonial rule in India causes worse outcomes today.

Table 8 shows whether these colonial administration tactics can explain the relationship between resistance to colonization and GDP per capita today. From this table one can see that only ethnic group functionalization can explain the results found here: ethnic group functionalization is positively and significantly related to resistance to colonization and negatively and significantly related with log GDP per capita in 2005, absorbing the variation previously found from resistance to colonization.

Ethnic group functionalization is the only colonial institution, of those so far considered, that seems to have any likelihood of explaining why resistance to colonization would lead to negative post-colonial outcomes. Native groups would decide whether or not to resist colonization based on the net benefit to them of being colonized: strong groups were more likely to resist because their net benefit of colonization was negative and less than that of weak groups. All groups were eventually colonized, and colonizers were faced with the task of administering a colony which was comprised, at least in part, of unwilling, uncooperative native groups. Thus, the colonizer allied itself with the cooperative groups, coopting them into positions of power since they were not actively resisting the colonizers activities. The native groups were probably willing to help the colonizer to subdue and control the other native groups since they were likely enemies with the other groups prior to the colonizers entrance into the region. This allocation of groups to power based on ethnolinguistic or religious affiliations is bad for a country and bad for the economy, leading to long-run negative economic outcomes. In countries in which no groups resisted, no groups are put into position of power over others, and this negative relationship does not occur.

Additional support for this argument comes from looking at sub-group analysis based on colonizing country. When splitting colonizers into France, Britain, and everyone else, one can see that French colonies are the only ones who do not exhibit the negative relationship between colonial resistance and present-day GDP (column 1). This can be explained by the analysis in column 2, which shows that the French, unlike the British and possibly others, did not employ ethnic group functionalization in response to resistance to

colonization (though they did employ it more than other colonizers). Thus, it seems that the British reacted to resistance with ethnic group functionalization, likely because they used less direct rule and needed cooperative agents, while France uniformly used a policy of ethnic group functionalization regardless of resistance, favoring groups closer to the colonial center rather than those that were cooperative with colonization. Wucherpfennig et al (2016) explains that France and Britain, the two main colonizing powers at this time, had different colonial administration strategies that may explain this result: Britain tended to use less direct rule, leaving extant pre-colonial administrations in place whenever possible, whereas France used a more direct style of rule and tended to ignore pre-existing governance structures, preferring to replace them with their own. Additionally, the French system of colonial administration favored native groups living closer to the colonial capital, creating de facto ethnic group functionalization based on geography. Thus, it stands to reason that Britain would use ethnic group functionalization specifically in situations in which their regular method of indirect rule was not sufficient to maintain control of the colony, whereas France enacted policies that resulted in ethnic group functionalization across all of their colonies. Furthermore, analysis done at the regional level shows that the negative relationship between resistance to colonization and GDP per capita and the positive relationship between resistance to colonization and ethnic group functionalization hold in all regions except Asia (figure 3 and table 10): while France and Britain had both resisting and non-resisting colonies in most of these areas, the only two non-resisting colonies in Asia (Lao PDR and Cambodia) were also French colonies, and would not be expected to follow the same trends as the rest of the sample.

Ethnic group functionalization is not necessarily the only way that resistance to colonization relates to poorer outcomes today, though it is the only one that can be seen with the data I have. There are other negative impacts of conflict between the native groups and colonizers that could lead to worse outcomes post-colonialism. For example, native groups that resist may be more likely to resent being a colony, and may more acutely feel unempowered, leading to disengagement from society, the government, and the economy. This could lead to lower levels of investment in education or capital, less political engagement,

less production, and greater corruption. Also, it could lead to lower levels of trust by that group in the government and in the colonizing country long after the colonizer has left, and those levels of trust may matter for economic outcomes. Future work should consider other ways native groups may react to colonization based on resistance, and what impacts that may have on future outcomes.

Section VII: Conclusion

In this paper I have sought to better understand the role of the native population in determining the economic outcomes of colonization, focusing on the causes and consequences of resistance by native groups to colonization. I document that resistance to colonization is more likely to happen when the group is strong economically, politically, and militarily; native groups that are weak in these regards ally themselves with colonizers for protection and assistance, whereas native groups that are strong do not need this protection or assistance and are unwilling to give up autonomy in exchange for them. Former colonies that had native groups who resisted colonization have least a 50% lower GDP per capita in 2005 compared to those former colonies in which no groups had resisted colonization. This relationship is robust to many controls and concerns about alternative interpretations, and though causality cannot be identified, the endogeneity between resistance to colonization and present-day GDP per capita goes against the results found here. Finally, I identify ethnic group functionalization as a mechanism through which resistance to colonization would determine present-day economic outcomes. Sub-group analysis shows that these relationships hold everywhere except with French colonies because the French, unlike other colonizers, used ethnic group functionalization in all colonies, not just in those with resisting native groups. For the other colonizers, and in particular the British, ethnic group functionalization is a response to resistance by native groups and is related to lower GDP per capita today.

Understanding the economic impacts of colonial legacies can help to determine the reason why certain countries experienced worse economic development since independence and may inform remedies to help those that are still suffering the negative effects of colonialism. These results also introduce ethnic group functionalization as a potential determinant of economic development and raise questions about what

other domains ethnic group functionalization may be used and may also have determinantal effects. One example may be what happens after an external power topples a dictatorial regime and instills a different government in its place, sometimes called nation-building: if the external power then puts its allies in places of power over other ethnolinguistic or religious groups in this new government, it may have long-run detrimental effects. Greater understanding of the implications of ethnic group functionalization and the means through which it is affecting economic outcomes may inform international policy in regards to how to, or how not to, nation-build.

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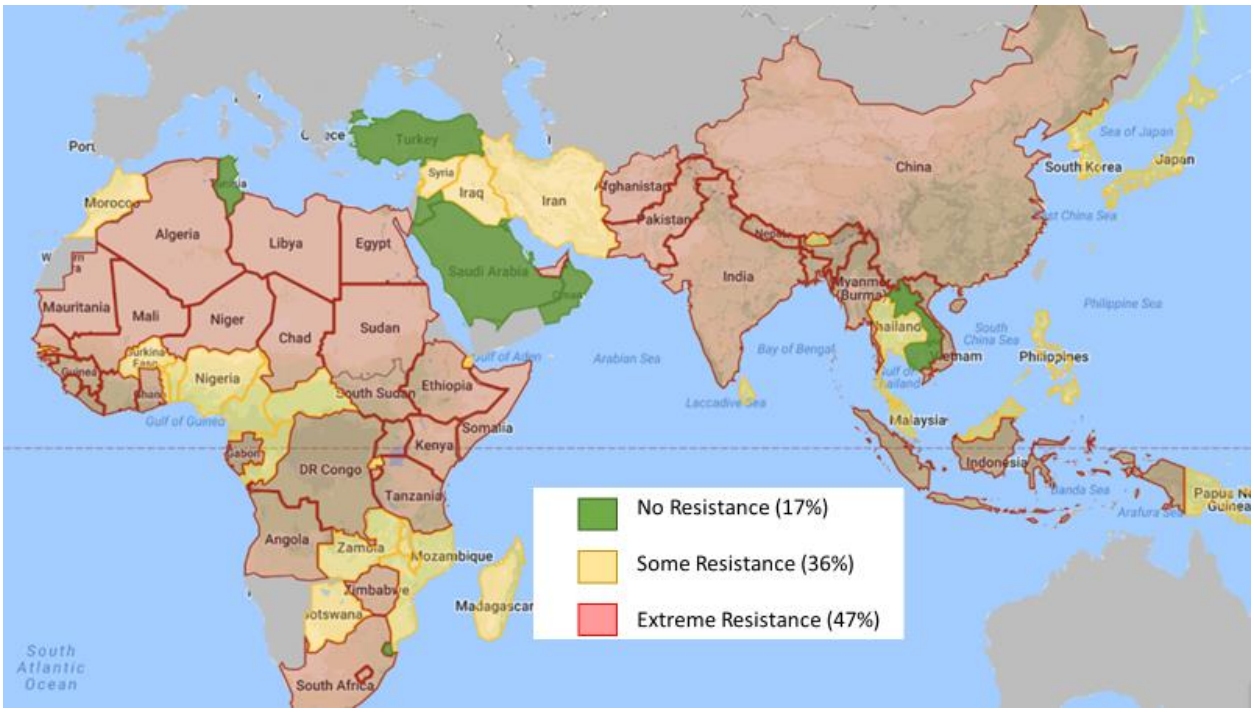
Figures

Figure 1: Map of Resistance to Colonization



Note: Countries in green have a resistance (violence) to colonization measure of 0, countries in yellow have a resistance to colonization measure of 1, and countries in red have a resistance to colonization measure of 2. Countries in grey are not in this dataset.

Figure 2: GDP/capita by Resistance to Colonization Level

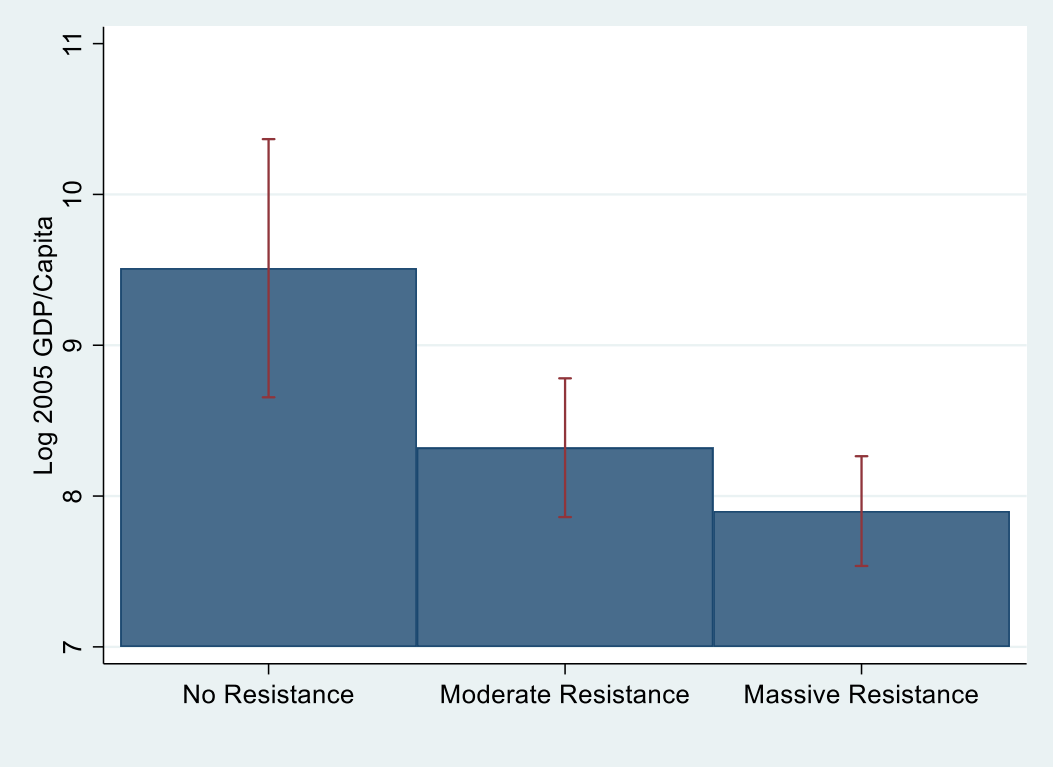
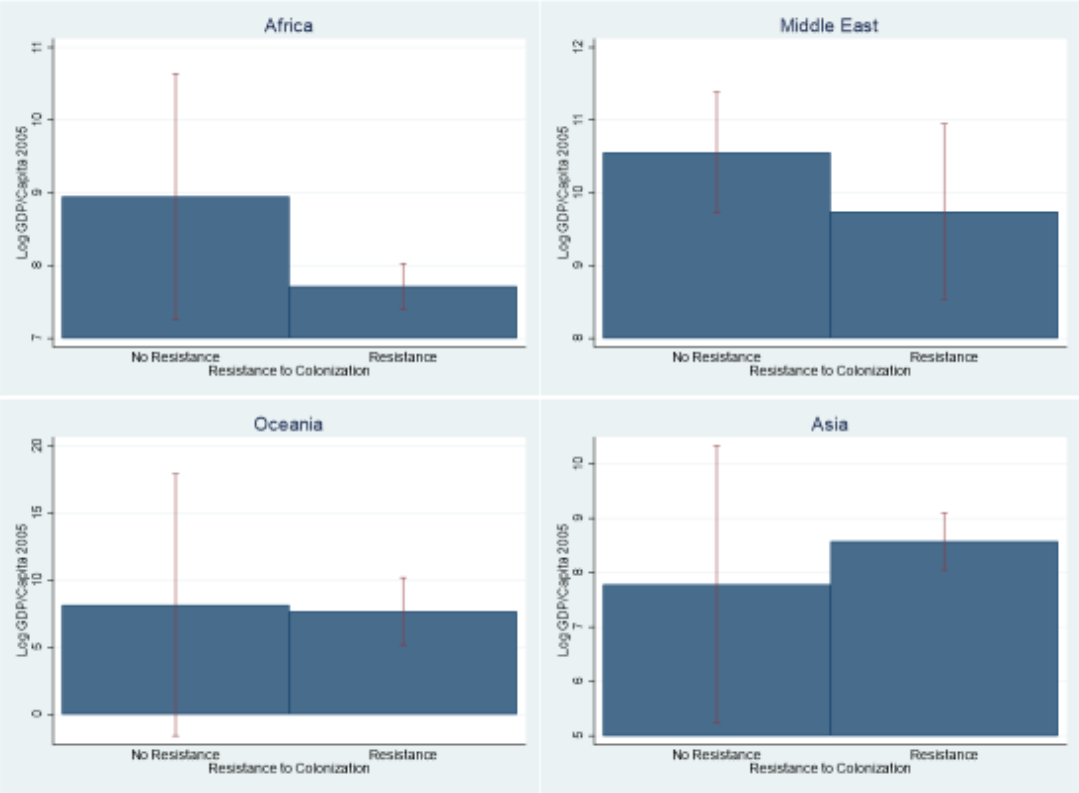


Figure 3: GDP/capita by Resistance to Colonization Level and Region


Africa
Log GDP/Capita 2005
7
8
9
10
11
No Resistance
Resistance
Resistance to Colonization
Middle East
Log GDP/Capita 2005
8
9
10
11
12
No Resistance
Resistance
Resistance to Colonization
Oceania
Log GDP/Capita 2005
0
5
10
15
20
No Resistance
Resistance
Resistance to Colonization
Asia
Log GDP/Capita 2005
5
6
7
8
9
10
No Resistance
Resistance
Resistance to Colonization

Tables

Table 1: Summary Statistics

Variable	N	Mean	SD	Min	Max
Resistance to Colonization (Violence at Colonization)	78	1.31	0.74	0	2
0- no resistance	13				
1- moderate resistance	28				
2- massive resistance	37				
Resistance during Colonization (Violent Resistance Movements)	78	0.83	0.75	0	2
0- no resistance	29				
1- moderate resistance	33				
2- massive resistance	16				
Resistance at Independence (Violent Independence Movements)	78	0.54	0.78	0	2
0- no resistance	50				
1- moderate resistance	14				
2- massive resistance	14				
Year of Colonization	78	1836.78	93.88	1506	1935
Year of Independence	78	1957.68	15.22	1906	1994
Years Colonized	78	120.9	96.53	12	469
Colonized by Britain	78	0.4	0.49	0	1
Colonized by France	78	0.29	0.46	0	1
In Africa	78	0.58	0.50	0	1
GDP per capita in 2005 (2011 International $, PPP)	78	10850.16	20414.87	548.51	109802

Table 2: Differences between groups by resistance to colonization

Resistance to Colonization	(1) No Resistance	(2) Moderate Resistance	(3) Massive Resistance	Difference (1)-(2)	Difference (2)-(3)
GDP/capita	29895.15	7917.41	6378.04	21977.73**	1539.37
	(9942.17)	(1794.21)	(2532.25)	(7180.823)	(3306.03)
Year of Colonization	1881.54	1824.83	1834.55	56.71+	-9.72
	(7.161)	(21.18)	(13.55)	(32.73)	(24.21)
Years Colonized	77.08	130.67	123.95	-53.59	6.72
	(8.36)	(21.55)	(14.27)	(33.40)	(24.97)
In Africa	.15	.57	.71	-.41*	-.14
	(.10)	(.09)	(.08)	(.16)	(.12)
Colonized by Britain	.62	.27	.40	.35*	-.13
	(.14)	(.08)	(.08)	(.16)	(.12)
Colonized by France	.23	.37	.26	-.14	.10
	(.12)	(.09)	(.07)	(.16)	(.11)
Abolute Latitude	.30	.19	.18	.08+	.02
	(.03)	(.03)	(.03)	(.04)	(.03)

Notes: Standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001.

Table 3: Initial Regressions

y=log(GDP/capita)	(1)	(2)	(3)	(4)	(5)	(6)
Moderate Resistance to Colonization	-1.190** (0.446)					
Massive Resistance to Colonization	-1.611*** (0.425)					
Resistance to Colonization		-1.429*** (0.408)	-0.941* (0.405)	-1.374*** (0.381)	-0.885* (0.404)	-0.737+ (0.390)
Africa			-0.963*** (0.259)		-0.933** (0.305)	-0.630* (0.304)
French Colony				-0.474 (0.338)	-0.0688 (0.375)	-0.079 (0.354)
British Colony				0.0714 (0.346)	0.250 (0.343)	0.243 (0.335)
Absolute Latitude						3.350*** (0.564)
N	78	78	78	78	78	78
R^2	0.192	0.170	0.286	0.204	0.298	0.372

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Moderate resistance to colonization, massive resistance to colonization, resistance to colonization, Africa, French colony, and British colony are all dummy variables.

Table 4: Pre-Colonial Economic Development

	(1)	(2)	(3)	(4)	(5)
	Resistance to Colonization	Log GDP/Capita			
		In Sample	In Sample	Out of Sample	Full Sample
Population Density 1500	0.0135** (0.00455)	-0.0176 (0.0217)	-0.0257 (0.0202)	0.0271** (0.00808)	0.0246*** (0.00725)
Resistance to Colonization		-0.498 (0.398)			
In Colonial Dataset					-0.158 (0.339)
Colony X Population Density					-0.0470+ (0.0244)
N	78	78	78	81	159
Controls	x	x	x	x	x
R^2	0.308	0.367	0.334	0.397	0.503

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Resistance to colonization, "In Colonial Dataset", and the interaction term are dummy variables. Controls for Africa, French colony, British colony, and absolute latitude are included.

Table 5: Other Violence Measures

y=log(GDP/capita)	(1)	(2)	(3)	(4)
Violence at / Resistance to Colonization	-0.737+ (0.390)			-0.669+ (0.387)
Violence during Colonization		-0.503+ (0.295)		-0.403 (0.301)
Violence at Independence			-0.302 (0.254)	-0.218 (0.258)
N	78	78	78	78
Controls	x	x	x	x
R^2	0.372	0.368	0.348	0.402

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Resistance to colonization, resistance during colonization, and resistance at independence are all dummy variables. Controls for Africa, French colony, British colony, and absolute latitude are included.

Table 6: Potential Confounding Variables

y=log(GDP/capita)	(1)	(2)	(3)	(4)
Resistance to Colonization	-0.830* (0.399)	-0.705+ (0.382)	-0.748+ (0.389)	-0.839* (0.395)
Year of Colonization	-.001 (0.009)			-0.004 (0.009)
Years Colonized	0.001 (0.008)			-0.002 (0.010)
Some Plantation Use		-0.399 (0.311)		-0.381 (0.322)
Extensive Plantation Use		-0.324 (0.345)		-0.450 (0.354)
Some Mining		0.635+ (0.370)		0.697+ (0.378)
Extensive Mining		0.553+ (0.318)		0.570+ (0.321)
Pre-Colonial Non-Centralization			0.051 (0.292)	-0.151 (0.304)
N	78	78	78	78
Controls	x	x	x	x
R^2	0.382	0.429	0.372	0.443

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Controls for Africa, French colony, British colony, and absolute latitude are included. Resistance to colonization, some plantation use, extensive plantation use, some mining, extensive mining, and pre-colonial non-centralization are all dummy variables.

Table 7: Institutional Analysis

	(1) Average Protection from Expropriation Risk	(2) Democracy (1960-2000 Mean)	(3) Executive Constraint (1960-2000 Mean)	(4)	(5)	(6)	(7)	(8)	(9)
				Log GDP/capita					
Resistance to Colonization	-0.599	1.166	0.918		-1.064*		-0.690+		-0.651+
	(0.603)	(1.044)	(0.679)		(0.405)		(0.389)		(0.379)
Average Protection from Expropriation Risk				0.257**	0.226*				
				(0.0854)	(0.0905)				
Democracy (1960-2000 Mean)						-0.0432	-0.0284		
						(0.0528)	(0.0534)		
Executive Constraint (1960-2000 Mean)								-0.109	-0.0786
								(0.0891)	(0.0878)
N	59	77	77	59	59	77	77	77	77
Controls	x	x	x	x	x	x	x	x	x
R^2	0.141	0.161	0.180	0.526	0.579	0.346	0.376	0.355	0.381

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Resistance to colonization is a dummy variable. Controls for Africa, French colony, British colony, and absolute latitude are included. Average Protection from Expropriation comes from Acemoglu et al (2001). Democracy and Executive Constraint come from Ashraf and Galor (2013) due to greater overlap with my set of countries.

Table 8: Potential Mechanisms

	(1) Ethnolinguistic Fractionalization	(2) Ethnic Group Functionalization	(3) Log GDP/capita	(4) Log GDP/capita
Resistance to Colonization	-0.0585	0.273+	-0.553	-0.818+
	(0.156)	(0.142)	(0.384)	(0.454)
Ethnolinguistic Fractionalization			-0.195	
			(0.400)	
Ethnic Group Functionalization			-0.714*	
			(0.334)	
Indirect Rule with Little Interference				-0.442
				(0.641)
Indirect Rule with Strong Interferences				-0.596
				(0.588)
Direct Rule				-0.324
				(0.632)
N	78	78	78	78
Controls	x	x	x	x
R^2	0.323	0.374	0.424	0.384

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Controls for Africa, French colony, British colony, and absolute latitude are included. Resistance to colonization, ethnolinguistic fractionalization, ethnic group functionalization, indirect rule with little interference, indirect rule with strong interference, and direct rule are dummy variables.

Table 9: Relationship by Colonizer

	Log GDP/Capita	Ethnic Group Functionalization
Direct Effect for Other Colonizers		
Resistance to Colonization	-1.228+ (0.660)	0.118 (0.139)
Colonizer Effects Compared to Other		
France	-1.404* (0.700)	0.434+ (0.237)
Britain	0.0101 (0.730)	-0.0617 (0.194)
Interaction Terms		
Resistance X France	1.503+ (0.786)	-0.226 (0.273)
Resistance X Britain	0.202 (0.808)	0.366+ (0.214)
N	78	78
Controls	x	x
R^2	0.399	0.410

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Resistance to colonization, France, Britain, as well as the interaction terms, are dummy variables. Controls for Africa and absolute latitude are included.

Table 10: Relationship by Region

		Log GDP/Capita	Ethnic Group Functionalization
Direct Effect for African Countries			
	Resistance to Colonization	-0.946**	0.444**
		(0.341)	(0.161)
Continent Effects Compared to Africa			
	Middle East	1.640***	0.131
		(0.392)	(0.195)
	Oceania	-0.566	-0.401**
		(0.613)	(0.150)
	Asia	-0.919**	0.720***
		(0.338)	(0.160)
Interaction Terms			
	Resistance X Middle East	0.108	-0.165
		(0.703)	(0.336)
	Resistance X Oceania	0.593	-0.264
		(0.696)	(0.187)
	Resistance X Asia	1.650**	-0.750**
		(0.584)	(0.251)
N		78	78
Controls		x	x
R^2		0.501	0.473

Notes: Robust standard errors are in parentheses. + p<.10, * p<.05, ** p<.01, *** p<.001. Resistance to colonization, Middle East, Oceania, and Asia, as well as the interaction terms, are dummy variables. Controls for French colony, British colony, and absolute latitude are included.

Appendix 1: Colonization History and Institutions by Region

Different regions in this sample faced imperialistic institutions specific to their situations. In Africa, this institution was the Berlin Conference (November 1884 – February 1885) and the subsequent scramble for Africa. Prior to the Berlin Conference, every time a country colonized a region, they would make individual bilateral treaties with rival colonizers recognizing their territorial claim. As it became clear that countries were becoming increasingly interested in colonizing Africa, concerns started to mount that this would lead to war amongst the colonizers. Thus, representatives of the major European countries and the United States met in Berlin, Germany, in 1884 to address this concern. The conclusions of the Berlin Conference were that no countries attending could fight each other over colonial territory as long as the colonizer had a treaty with the colonized group stating that they were a protectorate (Ohaegbulam 112-113). However, the Berlin Conference did not specify which lands would belong to which countries, merely creating "the rules of the game" (Ferro 76), and thus the subsequent years saw the "scramble for Africa", in which every major European colonizer sought as much African territory as possible to increase economic markets, claim militarily advantageous positions, and prevent rival colonizers from getting that land.

The Middle East also had institutions and events that were unique to the region that affected its colonization. One such institution was the Trucial States. These were independent sheikhdoms in the Arabian Peninsula that entered into the General Treaty of Peace (1820) with Britain (Zahlan xi-xii). Britain was concerned about the inter-sheikdom warfare and piracy that was going on in the Arabian Gulf that could affect British trade routes and their connection with their Indian colony. Additionally, the sheikdoms of the Arabian Peninsula were still using slavery in the 1800s. Britain made treaties with all of these sheikhdoms that prohibited warfare and piracy in the Gulf and prohibited slavery in the sheikdoms. This led to sheikdoms forming treaties with each other that specified Britain as an external arbiter for inter-sheikdom conflicts. This increased reliance on British interference led to further treaties between Britain and the sheikdoms that prevented them from making treaties or trade agreements with other colonial "powers", which made them protectorates and officially a part of the British empire.

Another situation specific to imperialism in the Middle East is the existence and fall of the Ottoman Empire. Prior to European involvement in the Middle East, the Ottoman Empire extended from Egypt to Iraq and was centered in Anatolia, or present-day Turkey. The Ottoman Empire dissolved in 1918 with its loss in World War I, but it had begun to weaken and lose territories in the early 1800s. These territories were often then colonized by European countries (Lehning 169). When the Ottoman Empire collapsed in 1918, the winning powers, particularly Britain and France, devised the Skyes-Picout agreement, in which they divvied up the remaining Ottoman territory into spheres of influence for themselves, Italy, and Greece (Ferro 98). This then led to the colonization of these areas by the country with the sphere of influence.

In Central and East Asia, there was a similar scramble as that seen in Africa (Johnson 51). However, the scramble was less organized, as no equivalent to the Berlin Conference or Skyes-Picout agreement existed in for the region (Lehning). However, the scramble still existed, and was driven by the colonizing countries' economic and political ambitions, as well as inter-colonizer competition.

While particular institutions and events define imperialism in each region, the motivations and actual execution of imperialism were typically the same for each colonizer and each place. Colonizers had to enter treaties with the people that they were colonizing, specifying that they were creating a protectorate in the region. Through this method they increased economic and political influence and created true colonial states in the region. Colonizers could not use undue force to overcome native peoples and maintain control in a region, but they could use as much force as was necessary, which could be extreme. Differences in violence were a reaction to variation in the actions of the people being colonized, rather than variation in the policies of the colonizing forces.

Appendix 2: Case Studies of Non-Resisting Former Colonies

This section presents case studies of countries that were violently and non-violently colonized. I argue that violence at colonization is the result of the resistance to colonization, and that those who resisted were stronger, more stable, and more secure than those ceded without force.

i. Africa

In Africa, two countries were colonized without violent resistance: Swaziland and Tunisia. These two countries are not geographically close, nor were they colonized by the same country or for the same reason. However, their pre-colonial conditions were similar in that the native groups in each area were struggling, either with conflict or with debt. In both cases this hardship paved the way for increased European influence in the area.

Swaziland is a landlocked country bordered by South Africa and Mozambique. In the mid-1800s, prior to colonization, the Swazis were in conflict with the Boers, Dutch farmer-settlers in South Africa who would engage in acts of violence, vandalism, and theft against the Swazis. When Britain entered the area and engaged in the Boer war, they overcame the Boers and claimed South Africa as their own colony. Because Swaziland was left damaged, politically unstable, and militarily insecure, the Swazis were willing to cede to British influence in exchange for protection from future Boer attacks (Gillis 122-125).

Tunisia is a coastal North African country bordered by Algeria, a French colony, and Libya, which would end up as an Italian colony. Tunisia was of interest to both France and Italy: Italy wanted colonial holdings; France wanted to buffer its holdings in Algeria. Tunisia first came under French, British and Italian influence when it racked up debts to European lenders and declared itself bankrupt. France, Britain, and Italy were all then able to take control of Tunisian economic affairs. Then, France declared that Tunisian troops crossed into French Algeria and used this as an excuse to take control of the region (Anderson 101-119). Whether or not this was the case, the bankruptcy and European interference in their economic affairs led Tunisia to not resist colonization.

The above examples may suggest that those places experiencing intergroup conflict were more likely to be non-violently colonized by European powers. However, this is not the case. Intergroup conflict was very common throughout Africa, and the incoming Europeans were typically treated as just another group to wage war against (Falola 23). It is specifically those groups who were otherwise weakened or likely to lose intergroup conflicts that chose to enter protectorate treaties in exchange for influence (Falola 23-24).

Algeria, Kenya, and Nigeria are all examples of places that resisted colonization and were only successfully overcome through violence. However, their motivations for resistance are not uniform. Algeria was an Islamic state that considered it against their faith to be ruled by Catholics (Vandervort 60-63). The largest tribes in Kenya were major military powers given their conflicts with neighboring communities, and they were doing well controlling trade in the region and preying on European settlers, taking their goods (Parsons 289-291). They both had strong incentives to not allow European influence that would take away their economic control of the region and believed that they could successfully resist any military advance by a European power. Thus, they engaged in warfare against the incoming British and were only overcome through major bloodshed. In Nigeria, the leaders of local groups wanted to retain their political power, as well as to maintain their ability to control trade, including the slave trade, in the region (Falola 1-16). Thus, all of Nigeria was colonized by force or by threat of force by the British, who then took control of trade relations and extinguished the slave trade.

These examples suggest that in Africa, it was the weaker, rather than the stronger, groups that ceded without violence to the European colonizers. It was easier for European colonizers to convince militarily and economically insecure groups to enter protectorate treaties and to cede financial and political control. Places that had stronger states, more military success, and more economic strength were less willing to give up that power, and thus had to be forced into treaties. If there are any pre-colonial traits that correlate with non-violent colonization, they would be weakness and insecurity; and if those traits would have any direct

influence on GDP per capita today, it would likely be to lower, rather than raise, it. However, the opposite occurs in the empirical analysis above.

ii. Middle East

The Middle East will be analyzed independent of the rest of Asia due to the specific institutions regarding its colonization. As described above, these are the existence of the Trucial States and the fall of the Ottoman Empire.

The system of Trucial States brought Bahrain, Oman, and Qatar non-violently under British influence. Bahrain was one of the initial Trucial States, choosing British protection from neighboring groups while it was suffering from internal conflicts that weakened its power in the region (Onley 2004). Oman was not one of the original Trucial States, but the death of a leader and conflict over succession led to the intercession of Britain in the region's political affairs; it then became a Trucial State as the economy weakened and internal political dissonance made it susceptible to attacks from neighboring groups (Commins 87-90). Qatar was under Ottoman rule until 1913 when it received its independence from the Ottomans; however, it became a Trucial State and protectorate of Britain in 1916 to receive military protection from Ottoman encroachment (Smith 3, Metz 158).

However, not every Trucial State became so without violence. The piracy and maritime warfare targeted by the General Treaty of Peace were largely the work of sheikdoms in the region now known as the United Arab Emirates. Pirates from the region continued to attack boats of the East India Trading Company and others after Britain established its influence in the Arabian Gulf and bordering regions, and Britain responded by bombing the pirates' boats, the boats of others from these sheikdoms, and towns along the coast of the region (Zahlan 13-14). After that, the sheiks in the region acceded to become Trucial States and protectorates of Britain.

During this period the Ottoman empire was also disintegrating, successively losing territory until its loss of World War I and subsequent collapse in 1918. Qatar, as described above, was a part of the

Ottoman empire until it received independence and became a Trucial State. Other previous Ottoman holdings that became colonies non-violently are Kuwait, Saudi Arabia, and Jordan. In Kuwait, the assassination of an Ottoman-supported leader and replacement by his Ottoman-opposed brother led the new ruler to seek British protection from the Ottomans, resulting in a protectorate treaty (Smith 3, Metz 74). For Saudi Arabia, the Treaty of Darin in 1915 made Saudi Arabia a newly identified entity and a British protectorate after the region became independent from the Ottoman empire (Goldberg 125-132, Vassiliev 225). Jordan was involved in the Arab Revolt in 1918, in which rebels supported by the Allied Powers fought against the Ottomans and gained their independence. The Skyes-Picot agreement then divided the remains of the Ottoman Empire into spheres of influence, transitioning the Emirate of Transjordan into British control (Toukan 43-44). Turkey is considered the last country that was a part of the Ottoman Empire to non-violently transition into colonization. While still the Ottoman Empire, they became economically dependent on European markets and received military support to help retain defecting places (Cleveland and Bunton 58-59, 77). Thus, they were able to transition into European influence without violence, though they later lost their holdings and a war to the same countries.

Other lands lost by the Ottoman Empire did not transition so smoothly to European control. Egypt secured independence from the Ottoman Empire, but the new government accumulated debts to European lenders, who were able to take control of their finances. The Urabi Revolt resulted, in which Egyptians revolted against the foreign rule. The revolt was squashed, and power over the region was secured by the British (Cleveland and Bunton 98-100, Lehning 173-175, Vatikiotis 133-169). Lebanon was acquired through force by France from the Ottomans in response to the displacement and murder of Maronite Christians in the region, and control was validated through the Skyes-Picot agreement (Spagnolo 29-36, Salibi 109). Iraq was a part of the Ottoman Empire until its collapse and experienced warfare within its region during World War I. It was also allotted to Britain in the Skyes-Picot agreement (Cleveland and Bunton 161-165).

The only Middle Eastern Country that was neither a Trucial State nor a former holding of the Ottoman Empire was Iran. Called Persia at the time, Iran engaged in warfare with Russia numerous times, losing territory to them in the second Russo-Persian war. Britain was concerned with the proximity of this Russian influence to their Indian colony, and thus they began to exert their influence there as well (Cleveland and Bunton 113-115). Both Russia and Britain heavily influenced the region, mostly to prevent the other from taking full control.

Similar to the analysis of African transitions to European control, Middle Eastern groups that were seeking protection from neighboring combatants tended to become protectorates of European countries without any violence. Those places that were colonized with sought to maintain sovereignty and control in their regions, which threatened the interest of the colonizers. Even regions that transferred directly from Ottoman to European control were lost through a conflict that threatened the sovereignty of the native people, the Ottomans and their supporters. Thus, resistance to colonial control and pre-colonial strength remain the determinants of violence at colonization.

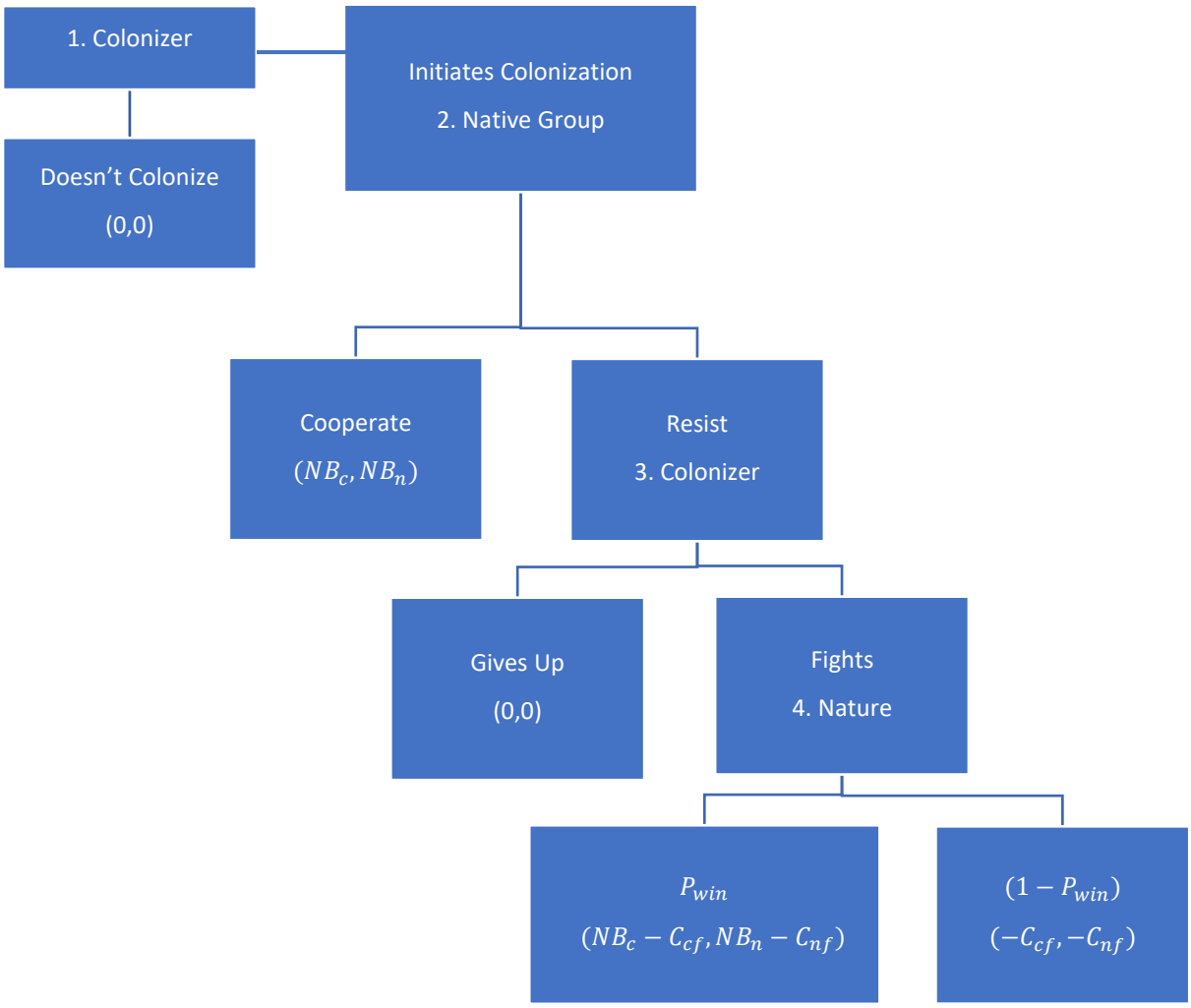
iii. Asia and Oceania

The motivations of groups in Asia and Oceania for allowing European influence without violent resistance are essentially the same as that of those in Africa and the Middle East: military protection from neighboring groups and financial crises. Cambodia and Laos both came under French influence due to wanting protection from neighboring groups that were militarily controlling them (Chandler 141-165, 172-173, Viravong 143, Stuart-Fox 16-18). Fiji experienced increasing British involvement and Australian settlements, and then when the nascent government, which the British had encouraged local tribal leaders to develop, ended up in extreme debt, the government handed over control of the islands to the British, despite the British not wanting them (Howard 21-25). In the Solomon Islands the British progressively increased their influence in the economy and government (Roberts-Wray 897). However, for the region to be officially a British protectorate, they needed the nominal consent of the people in the region. So the British went with their warship to the various tribes and told them that they were now protected by them;

the tribes were typically more concerned about conflicts with neighboring tribes than the British, so they did not resist (Bennett 106).

Asian regions that were violently brought under European influence were stronger groups that typically wanted to maintain their independence and even expand into neighboring territories. For example, Vietnam had a strong dynastic government that had to be militarily toppled before France could take control (Kratoska 315-316). China, though never totally colonized, lost autonomy over its administration after attempting to end the opium trade and losing the subsequent Opium War (Page and Sonnenburg 113). The expansion into neighboring territories also led to European involvement, particularly if that expansion encroached on long-held colonies like India or Malaysia. For example, Myanmar (Burma) came under British rule after the Burmese government attempted to overthrow territory neighboring British India and Britain waged war to prevent it (Topich and Leitich 43-49, Kratoska 199-201). Hence, it was not weak or indebted groups that were becoming colonies through violent force; rather, it was strong states that were able to attempt territorial expansion and those that believed that they could fight and win against the European powers.

Appendix 3: Game Tree



This game has two movers, a colonizer and a native group, who move sequentially. The first move is by the colonizer, who decides whether to approach the native group for colonization or not. If the colonizer decides not to attempt colonization, both groups get nothing, signifying a baseline outcome against which to compare the other outcomes.

If the colonizer does decide to approach the native group for colonization, the native group can then decide to cooperate or resist. If the native group cooperates, the colonizer gets NB_c and the native group

gets NB_n, signifying the net benefit of colonization for the colonizer and native group, respectively. This is a net benefit, rather than just a benefit, because there are benefits and costs of colonization for both the colonizer and the native group. For the colonizer, the benefits include control in the region, preventing competing colonizers from getting that colony, and any economic or military benefits from controlling the area. The costs for the colonizer include the costs of administering the colony. The benefits for the native group include protection from other groups, protection from competing factions within the group, and investment in the region by the colonizer, while costs include the loss of autonomy and freedom by the colonizer, and any economic extraction committed by the colonizer. Because net benefit includes both positive (benefit) and negative (cost) aspects, it can be either positive or negative.

If the native group decides to resist colonization, the colonizer decides whether or not to continue with the colonization. If they decide not to, the colonizer and native group both get nothing compared to baseline. This could be changed to include costs for the colonizer for backing down, but the overall conclusions of the model would be the same.

If the colonizer decides to continue with the colonization attempt, or to fight, then with probability P_{win} the colonizer wins the fight, and with probability $(1 - P_{win})$ the native group wins the fight. P_{win} is likely very high, since there are not many examples of the colonizer losing, and if they do they usually continue fighting until they win. Additionally, one can think of P_{win} as understood commonly by both the colonizer and the native group, as I will do here, or one can think of it as something that is believed to be different for the colonizer and the native group, as both likely went into the conflicts thinking that they would win.

If the colonizer wins, the colonizer gets $NB_c - C_{cf}$, which is the net benefit of colonization minus some cost of fighting, which could be thought of as loss of life or property, as well as damage to the relationship between the colonizer and the native group. Similarly, if the colonizer wins, the native group

gets $NB_n - C_{nf}$. If the native group wins, the colonizer gets $-C_{cf}$ and the native group gets $-C_{nf}$, meaning that both just lose the cost of fighting in compared to the baseline condition.

From here I summarize what the colonizer and native group will do. The colonizer will initiate colonization as long as $NB_c \geq 0$, or as long as their net benefit of colonization is positive. If the native group resists, the colonizer will continue the colonization attempt, or fight, if $P_{win} * NB_c \geq C_{cf}$, or the expected benefit of fighting is greater than the cost of fighting.

The choice of the native group is more interesting. The native group will resist if they think $P_{win} * NB_c < C_{cf}$, or that they think the colonizer won't fight if faced with resistance, or if $P_{win} * NB_n - C_{nf} \geq NB_n$, which is that the expected value of fighting is greater than the sure value of not fighting. This can be rewritten as $-(1 - P_{win}) * NB_n \geq C_{nf}$, which shows two things: the native group is more likely to resist as NB_n, C_{nf}, and P_{win} decrease; and the native group will only resist if NB_n is negative. All of these things are more likely with stronger native groups. Strong native groups are more likely to win, so the probability of the colonizer winning is lower. The stronger native groups are more successful militarily, meaning that they are less likely to lose lives in a conflict, making the cost of fighting lower. And strong groups are more likely to lose out from colonization, and to lose out more than weak groups, making the net benefit of colonization lower and more negative for strong groups. This is true even if strong and weak groups end up with similar outcomes under colonization, because the net benefit of colonization is being measured as the difference between the baseline without colonization and the result with colonization, and strong groups are at a better baseline level than weak groups. And it is from this that one can see how the model summarizes the results of the historical analysis: stronger groups are more likely to resist colonization, and weak groups are more likely to cooperate with colonization, because stronger groups are more likely to think they will win against the colonizer and that they are going to lose out more from being colonized.