The Persistent Effects of Compensation for Abolition (Preliminary Draft)

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Abstract

Throughout the 19th century, colonizers officially abolished chattel slavery in their territories. The process of abolition granted compensation to slave-owners as a reimbursement for their 'property' loss. I exploit the intuition behind compensation to estimate its long-run effect on current economic performance. The financial award assisted slave-owners in continuing plantation production, mistreating former slaves, and maintaining power in the territories. These effects are detrimental to economical and institutional development, and are still being felt in the Caribbean. Slave-owners received compensation based on the prices they paid for slaves before abolition, and prices were determined by the demand for slaves and distance to slave markets. Low density territories faced labor shortages and were further from slave markets. With compiled colonial data, I use population density as an instrument for compensation and find that compensation significantly reduces 2019 GDP per capita levels. Mediation analysis suggests that roughly a third of this effect is working through institutional development.

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JEL Codes: N16, N46, N56, P16, O11.

1 Introduction

Caribbean territories are linked with a common history of indigenous genocide, colonialism, and slavery. Nonetheless, observing contemporary data reveals various levels of economic performance across the region. There are relatively high income territories such as Bermuda and St. Barthelemy and poorer territories such as Belize and Jamaica.[1] Why does this divergent path exist? One argument advanced by scholars is that slavery is an extractive institution inconducive for long-run development. Areas which had a greater presence of slaves have worse economic conditions today (Engerman and Sokoloff, 2002; Nunn, 2007). A second explanation by Acemoglu et. al. (2001) states that areas where Europeans settled established better institutions which effects current incomes. Both explanations share a common ground about the long-run effect of institutions.

An argument that has been overlooked by social scientists is the transition out of slavery in the region. Engerman (1982, 1984) highlight its importance, and the varied responses to abolition across the West Indies, but fails to connect it with current conditions of these territories. Known as the 'Great Experiment' (Green, 1991), colonizers attempted to abolish slavery while keeping the plantation alive. The most important aspect of this transition was compensation to slave-owners for their 'property' loss. The purpose of compensation was to make the transition to free labor "...gradual, and to ensure the continued dominance of the planters and dependence of the freed slaves" (Bolland (1981): 594).[2] It is relevant for current economic performance because it incentivized slave-owners to maintain the plantation system when it was not profitable. It also harmed institutional development because slave owners continued to force the plantation on the freed slaves, who now had some ability to reject it. The two dominant classes,

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[1]Bermuda is technically not in the Caribbean, but the nation is included in our analysis due to the commonalities with the region. Haiti is the poorest country in the region, but is not included in our estimation because of its unique path to abolition.

[2]Free laborers are defined as those freed from slavery (Drescher, 1999). However, they were far from 'free' because coercion still played a huge factor in their employment, i.e. apprenticeship, indentured labor, rent-wage system (See Section (3)).

one with political and economical power, white plantation owners, and one with the majority of the population, black laborers, continued to be in conflict. I find compensation for abolition has a persistent negative effect on contempory economic performance for 28 Caribbean territories of various backgrounds.

For most colonies, the formula for compensation was based on the price paid per slave in the period preceeding abolition (Blériot (2000): 160); (Draper (2010): 104).[3] Thus, areas in which the demand for slaves were high, or the purchase of new slaves were difficult, paid a higher premium in the slave market and therefore received more compensation. This formula is relevant for two reasons. First, if demand for slaves were high, it means either the plantation system was growing or slave death rates were exceeding birth rates. Both explanations suggest a conflict between slaves and owners. If the plantation was growing leading up to abolition, then owners were more likely to force the plantation system on slaves after they were freed. A high proportion of deaths to births suggests that slaves were being treated more brutally in areas with high compensation. Therefore, compensation not only kept power in the hands of plantation owners and propagated an environment of conflict, it granted more power to the areas in which the interests of owners and slaves were least compatible.

The second reason the formula is relevant is because I exploit it for an instrumental variables analysis. I use population density in 1830 as an instrument for compensation because plantation production was growing in less-dense areas which were geographically further from slave markets.[4] Instrumental variable estimation is necessary for causal results because compensation favored newer colonies, since the more established territories were not expanding their plantation production. If we assume that the older colonies were more developed, then a simple OLS may suffer from selection bias because a strong predictor of current incomes is

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[3]The exception are the Dutch colonies, who based compensation on the value of products produced by slaves (Fatah-Black et. al. (2023): 167). Still, this formula favors colonies whose plantation production is growing.

[4]Although the slave trade was banned in 1807 by Britain, 1817 by Spain, and 1818 by France, the illegal slave trade still occurred as slaves were imported from older to newer plantation economies (Williams, 1942).

past incomes (Nunn, 2020). Population density is an exogenous source of compensation variation, and therefore meets the criteria for a proper instrument.

The argument is outlined in Figure (1). Relatively low dense areas received higher compensation for abolition. Compensation incentivized slave owners to continue plantation production, even when slaves rejected it and/or when its production was not profitable. Additionally, compensation tended to favor areas which treated slaves more brutally. The barbaric, racist, and conflicting institutions from slavery continued to live on well past abolition. The institutional impact still affects the Caribbean people and harms current economic performances. I find that about a third of compensation's effect on 2019 GDP per capita (pc) works through this institutional channel with a mediation analyis. I also replace GDP pc with institutions as our dependent variable of interest, and find the results to be unchanged. Our estimates are robust to different years, control variables, samples, and measurements. The transition out of slavery, specifically compensation to slave owners, can explain part of the divergence in economic performance across the West Indies.

Figure 1: Schematic Summary
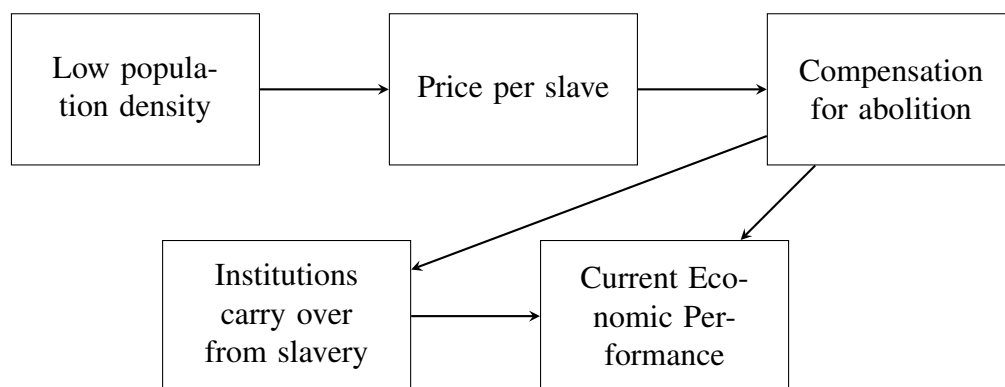
The following section reviews the literature related to the topic. Next, I provide historical background of the transition out of slavery in the region. Then, I examine the relationship between compensation and current development with an OLS estimation. Section 6 addresses

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the issue of causality by using population density as an instrument for compensation. I then analyze institutions as a possible channel for this causality with OLS and mediation analysis. Finally, I perform various robustness checks on the results in Section 8 and conclude with considerations of the novelty and drawbacks of the study in Section 9.

2   Literature Review

This paper is related to literature in economic history that seeks to explain current economic development with historic events.[5] A large share of this research deals with the persistence of culture and institutions that were developed under colonialism. Engerman and Sokoloff (1997, 2002, 2006); Sokoloff and Engerman (2000) explain the divergent development paths of countries in the Americas by their factor endowments in the colonial period. Colonies suited for sugar plantation production were extremely unequal, which resulted in improper institutional development in the long-run. Acemoglu et. al. (2001) find that areas settled by Europeans in the colonial period established better institutions than areas that were used for extraction. These institutions persisted through time and have an impact on current economic conditions. The results of their study are causal as they implement an instrumental variables (IV) approach using mortality rates of settlers as an instrument for current insitutions.

In Engerman (1982, 1984), the chief concern is the transition out of slavery. They recognize three patterns of economic adjustment for the British West Indies: ex-slaves continued working on the plantation and production was maintained, the plantation system was weakened as ex-slaves formed their own subsistence communities, and ex-slaves were replaced by contract labor from India who kept the plantation steady.[6] They argue land to labor ratio to be vital in

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[5]See Nunn (2009, 2020) for a recent overview of this literature

[6]The first pattern characterizes the older, dense colonies of Barbados, Antigua, and St. Kitts. The second pattern generally characterizes newer colonies like Grenada and St. Vincent, but also Jamaica. These colonies were still dense, but not as dense as the first category. The final pattern signifies the very sparse, newer, but growing economies of Trinidad and British Guiana (Engerman (1984): 142)

determining the varied responses to abolition. In less dense areas, ex-slaves could set up their own subsistence communities, so these areas faced the most difficulty in sustaining plantation production if they could not import contract labor. The current paper is an extension of the work by Engerman (1982, 1984), as I connect population densities to current economic conditions. Population density was an important characteristic for the survival of the plantation, but also for the amount of compensation. However, the plantation system is not suitable for long-run development, so the dense areas where it easily persisted are not necessarily richer. Rather, the key variable is compensation, which allowed the plantation to exist even in areas where it was not profitable.

More recently, the effects of slavery have been explored by Nunn (2007, 2008). Nunn (2007) examines slavery in the Americas and finds that areas with a greater share of slaves are associated with worse current economic performances as hypothesized by Engerman and Sokoloff (1997, 2002). Nunn (2007) observe the same relationship when focusing on U.S. counties and British West Indian colonies, respectively. Although the results are not causal, an important takeaway is that he rules out the explanation of Engerman and Sokoloff (1997, 2002) of inequality as the channel for which slavery effects economic development.

The long-term effects of the slave trade on Africa are analyzed in Nunn (2008). Using distance to destination as an instrument for slave exports of a specific country, the study shows that slave exports have a negative effect on current economic development. Also relevant is Iyer (2010), she finds that regions under direct British rule in colonial India have relatively worse current economic performance. Cultural anthropologists have argued that the persistence of culture is from the adoption of "rules-of-thumb" behaviors (Boyd and Richardson, 1985, 2005). Accordingly, Nunn and Wantchekon (2011) use Afrobarometer survey data to find that individuals whose ancestors were most affected by the slave trade in Africa are less trusting today. In general, the literature on the persistence of insitutions and cultures estab-

lished under colonialism have been shown to have negative effects on today's outcomes.

The Plantation Economy School of the Caribbean argues that the region is still characterized by plantation production and has undergone little structural change since its days as slave colonies (Beckford, 1999; Best and Polanyi-Levitt, 2009). The influence of slavery declared by the Plantation School is echoed in this paper. Their approach is to outline historical stages of Caribbean development starting with the slave plantation exporting staple crops to their colonizers. Today, the economies of the Caribbean are subject to four flaws that are directly linked to their history. First is the lack of export diversification. Each country still produces a narrow range of goods or services for the consumption of advanced countries. Second is foreign control which limits local entreprenuership and prevents profits from being invested domestically. The export industries of these countries are almost completely owned by muti-national corportations (MNCs) operating in other countries. Third is import dependency. Whereas the export sectors might be developed, the domestic sectors are not, which requires the region to import much of its consumption. The last impediment, is poor institutional development, which is the focus of this paper, and is created by the passivity of local control in the economy and the stark differences across class and race in the islands. The thesis of the Plantation Economy School is summarized as follows:

> "We suggest that plantation legacy represents an endowment of mechanisms of economic adjustment that deprive the region of internal dynamic. More specifically, it embodies patterns of income generation and disposal that discriminate against economic transformation" (Best and Polanyi-Levitt (2009): 13).

3   The Great Experiment

Slavery ended after a long process of abolitionist movements by humantiarians, economists, and slaves. Humanitarians viewed slavery as a disgusting treatment of fellow humans and

slaves added pressure through revolts, escapes, and a successful revolution in Haiti. However, the economic reasoning was the most persuasive. Profits from the plantation were past its peak (Ward (1998): 124). Some argued that that free labor would produce sugar and other export crops done by slaves more efficiently and others disagreed, declaring compensation to slave-owners as a neccessary corollary to abolition (Beauvois (2016): Ch 3). The plantation lived on, and the same institutions which it was built upon continued to survive.

> "Emancipation modified the class structure of the West Indian colonies without destroying its hierarchical character or the criteria upon which that hierarchy was founded. Although occupation, wealth, and education were determinators of class status, race remained the fundamental factor." (Green (1991): Free Society, 1)

In 1834, the British set the tone by emancipating slaves with compensation to slave-owners. Other colonizers with stakes in the Caribbean (France, the Netherlands, Denmark, Sweden, and Spain) all followed suit in the coming years.[7] In total, this analysis comprises 28 territories of the six colonizers mentioned. Slavery in the West Indies took a different form than in other parts of the world. For this area, slavery was all-encompassing; Europeans wiped out the indigenous populations so it effectively became the only organization of production. The movement out of slavery was a mixture of three components that favored slave-owners: financial compensation, apprenticeship, and land compensation (Beauvois, 2016).[8] The components had varying degrees of magnitude across the territories, but in common was financial compensation.[9] The purpose of each was to ease the transition of slavery to free labor, while keeping the plantation owners happy (Butler (1995): Ch. 1).

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[7]The USA also gave compensation to slave-owners in Washington D.C. so that the district did not join the confederacy prior to the civil war (Beauvois (2016): 2).

[8]For example, in the USA slavery in the south was ended after the Civil War. In the north, there was a gradual transition through freeing the new born children of slaves. However, slave owners in the Washington D.C. district were compensated so that they would remain loyal with the North.

[9]With the exception of Cuba, Haiti, and the Dominican Republic which are not part of this study. Cuban slave owners did not receive compensation, and Haiti/Dominican Republic ended slavery through revolutions. Puerto Rico was the only colony to be granted land compensation.

The transition was a major debate among government officials. They did not want to end plantation production, so they deliberated on what was the best way to end slavery without causing major disruptions to the current order. At the time, colonial sugar production was past its peak. Abolitionists argued that free labor would incentivize hard work and improve production techniques so that the sugar industry could be revived. However, not everyone was convinced by this argument, but abolition was a force that could not be contained. Those that were not convinced resorted to demanding compensation in order to save the colonial outposts and maintain the plantations (Beauvois (2016): Ch. 3).

> Yet providing relief to the colonists was not the only goal of aid payments. More broadly speaking, such payments were intended to make it possible to restore credit and pay the future freedmen. The injection of new capital was presented as one of the solutions that would revive or "regenerate" a colonial economy that was considered moribund. (Beauvois (2016): 35)

The most comprehensive overview for the compensation and abolition process is done by Beauvois (2016). The author argues compensation had three dimensions: legal, economic, and political. The legal dimension relates to slaves as property defined by law, so slave owners felt they had the right to some form of compensation. Economically, compensation helped the plantation continue under free labor, even when it was not profitable with slavery. Lastly, the process was political because compensation ensured colonial cooperation. It helped each empire maintain solid relations with the upper classes within the Caribbean and elsewhere.

The experience of the transition from slavery was heterogenous across the colonies. Population densities played an important role for the economic adjustment of the region following abolition. In general, sugar production declined dramatically as slaves left the plantations and formed their own subsistence communities, especially in larger territories (Engerman (1984): 142). The goal of more efficient production with free labor was not fulfilled in most territories. Ex-slaves would rather live in subsistence than work for their ex-masters who spent centuries

brutalizing their people (Engerman (1982): 199). These ex-slaves would become the "peas-
antry" of the West Indies (Marshall, 1968). Just because the labor was 'free' did not mean
there were many options for the ex-slaves, and in highly dense territories the only option was
to remain on the plantation. All freed slaves, including the peasantry, were still prevented from
enjoying the same freedoms and power as the owners.

Owners used various methods to keep the freed slaves on the plantation. One of such was
apprenticeship, which meant that slaves were contractually tied to their masters after abolition.
Therefore, slaves were not completely free until apprenticeship ended (Bolland (1981): 592)
(Green (1991): Ch. The Apprenticeship). Another strategy by owners was the rent-wage sys-
tem. Slaves had been living on grounds near the plantation throughout slavery. Once slavery
ended, owners charged rent on these living grounds. This incentivized slaves to work the plan-
tation to avoid losing their homes. Moreover, some owners only accepted rent payment in the
form of direct deduction from plantation wages. Therefore, the only way freed slaves could
pay rents was through working the plantation (Bolland (1981): 595). Owners also privatized
the fertile lands and prevented ex-slaves who left the plantation from gaining access (Bolland
(1981): 598). Finally, owners manipulated laborers by paying their wages in advance. This
kept workers in permanent debt to the employers which forced them into labor contracts (Bol-
land (1981): 606).

The political and economic power of the slave-owners was aided by compensation.[10] Low
population density created disruptions to the plantation, but owners combated them by making
it legally difficult to leave and also by importing contract labor. Suriname, Guyana, French
Guiana, and Trinidad all relied on contract labor from India throughout the mid to late 19th
century. Other relatively lower population density areas, like Grenada, Jamaica, Belize, St.
Lucia, and Puerto Rico were not as successful in attracting labor, but still pushed the plantation

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[10]An example of this is the legacy of slave owning families in the French Caribbean, who still hold economic
power over Guadeloupe and Martinique (Numa, 2018).

on slaves through the above mentioned legal measures with varying degrees of success. These great lengths to sustain the plantation was made possible by compensation. In high population density areas with relatively lower compensation, like Barbados, Guadeloupe, and Martinique, owners did not have to force the plantation, as ex-slaves had no other choice. While still not an environment conducive for development, the level of conflict between slaves and slave-owners was not at the same level as in the low population density (high compensation) areas.

3.1   Country Backgrounds

Table (1) gives an overview of the slave colonies analyzed in this study. Column 1 has the name of each colony seperated by colonizer with the date of abolition in parentheses. The British West Indies were the first to abolish slavery in 1834, followed by the Swedish West Indies, Danish, French, Dutch, and finally Puerto Rico.[11] The varied levels of current economic conditions are in third column. On the surface, the average GDP per capita of the region looks strong at $26,556.67. However, this masks the extreme inequality of the territories.

Slave populations in 1830 are found in column 4. In total, there were roughly 1 million slaves across the 28 colonies in 1830, with over half coming from the British West Indies. Most of the colonies were specialized in sugar production which required large sources of slave labor. Exceptions are Anguilla, St. Barths, Bonaire, the Bahamas, Bermuda, and Belize. The soil was not suitable for sugar production in these colonies. In the first five, slaves did various domestic labor and worked in relatively small plantations (Higman, 1995). Due to the nature of the work, slaves were treated relatively better in these five territories (Bellhorn, 1992). The story is different for Belize, where slave labor specialized in the harvesting of timber and mahogany. These industries required tolling manual labor, so slaves were mistreated at the same level, or even higher in some instances, than the sugar plantation economies (Craig,

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[11]The Swedish West Indies are present day St. Barthelemy, a French territory. The Danish West Indies are the present day U.S. Virgin Islands. Spain ended slavery in Puerto Rico prior to its ban in other territories, such as Cuba.

Table 1: Territory Statistics

Colony	Code	GDP pc (2019)	Slave population (1830)	Compensation per slave (1873 $)	Compensation per slave (PPP 2019 $)	Slave pct (1830)	Apprenticeship period
Britain (1834)		22481	663127	216.45	4182.95	81%	1834–1838
Anguilla	AIA	25229.43	2260	148.06	2861.27	79%	-
Antigua and Barbuda	ATG	20383.22	28635	149.55	2890.17	80%	-
The Bahamas	BHS	36856.81	9995	115.15	2225.43	56%	-
Barbados	BRB	16848.96	83150	186.19	3598.27	80%	-
Belize	BLZ	6855.59	1895	455.38	8800.58	45%	-
Bermuda	BMU	79814.77	4277	112.16	2167.63	39%	-
Dominica	DMA	11685.98	14165	169.74	3280.35	73%	-
Grenada	GRD	16061.98	23645	224.33	4335.26	84%	-
Guyana	GUY	13320.57	83545	437.44	8453.76	88%	-
Jamaica	JAM	8928.11	311070	171.24	3309.25	84%	-
Montserrat	MSR	19974.50	6400	149.55	2890.17	85%	-
St. Kitts and Nevis	KNA	27529.55	26365	148.06	2861.27	82%	-
St. Lucia	LCA	15094.65	13275	223.58	4320.81	73%	-
St. Vincent and the Grenadines	VCT	11894.91	22250	228.81	4421.97	82%	-
Trinidad and Tobago	TTO	26736.16	32200	326.02	6300.58	67%	-
The Netherlands (1863)		28546.26	61932	138.05	4109.81	73%	-
Aruba	ABW	36799.81	393	101.39	3018.46	14%	-
Bonaire	BON	27000	547	101.39	3018.46	37%	-
Curacao	CUW	22561.62	5894	101.39	3018.46	39%	-
Saba	SAB	24300	700	101.39	3018.46	70%	-
St. Eustatius	EUS	38400	1614	101.39	3018.46	71%	-
Sint Maarten	SXM	35603.58	4000	50.7	1509.23	67%	-
Suriname	SUR	15158.82	48784	152.09	4527.69	87%	1863–1873
France (1848)		25690.80	202890	135.5	3416.79	80%	None
French Guiana	GUF	18759.6	19102	179.67	4530.72	84%	-
Guadeloupe	GLP	28970.4	97339	136.29	3436.64	81%	-
Martinique	MTQ	29342.4	86449	124.85	3148.3	79%	-
Danish West Indies (1848)	VIR	40021.78	26879	73.07	2150.26	65%	1848–1849
Puerto Rico (1873)	PRI	37453.79	34240	221.48	7797.78	11%	1873–1876
Swedish West Indies (1847)	BLM	52000	1387	131.89	2937.19	35%	None
Total		26556.67	990455	191.13	4089.49	65%	-

Notes: The table reports an overview of the 28 territories in this study, seperated by colonizer and abolition year. GDP pc (2019) are current levels of GDP per capita for 2019 in $. Slave population and slave percentage both are from around 1830. Some territories reported different years, but they are all in between 1825 and 1835. The compensation measures are the per slave financial amounts, first in 1873 dollars and second in 2019 dollars using PPP adjustments (Described in Section (4) and Appendix (A)). Lastly, apprenticeship period refers to the years following abolition where slaves remained tied to their slave owners.

1969). Also, the mahogany and timber industries were extremely volatile. It turns out that the period preceeding abolition was a boom, which inflated the prices of slaves and therefore compensation (Bolland (1981): 602).

Columns 4 and 5 are the amount of compensation in U.S. dollars using 1873 and 2019 as base years, respectively. The construction of these variables are covered in Section 4 and more deeply in Section A. On average, colonizers granted slave owners between $2,000 and $8,000, adjusted to 2019 PPP levels. Puerto Rico, was the only territory to implement the three components of abolition. That is, financial and land compensation plus the apprenticeship period. Their large amounts of compensation include the value of land. Multiplying the total slave population by the average amount of compensation yields an estimate of $4 billion in 2019 levels. This is a rough estimate as slave-owners did not receive full compensation for all their slaves. Also, although it is PPP adjusted, the number does not reflect the increase in the quantity and quality of goods needed to maintain an equal relative living standard as that in the 19th century. Most likely, the number is much higher.

Slave percentage of the population is found in Column 6. Notice, there is no relationship between slave percentage and compensation. Compensation was based on the price paid per slave in the preceeding period of abolition for each colonizer, not the presence of slaves. Finally, in the last column we have the apprenticeship period for each colonizer (Beauvois (2016): 223). Apprenticeship was established in all British colonies although some, like Antigua and Bermuda, refused to implement it as they were optimistic about their slave and slave-owner relationship (Engerman (1982): 193). The Dutch only enforced apprenticeship in their colony of Suriname, which were growing their plantation production at the time of abolition. France and Sweden did not establish apprenticeship.

The British government agreed to compensate slave-owners a total of £20 million[12], or 40% of government expenditure in 1834. According to Draper (2010: 107), the equivalent of the same share of spending is £200 billion today. The £20 million was divided amongst the colonies based on the average prices they paid per slaves in previous years.[13] They each got roughly 45% of the average price paid per slave from 1823-1830 times the total of slaves in the colony. It was then up to the colonies to distribute their amount received to their slave owners (Draper (2010): 104). In general, they followed a similar strategy where compensation to owners was highest for employed male slaves and lowest for slaves who no longer could work. Ward (1998: 130), argues that owners used compensation to solidify their position in the West Indies and pay off debts:

> "In general planters took the slave compensation money as an opportunity to wipe the slate clean of debt and consolidate their position, rather than to make their escape from the West Indies."

France is the only country where slavery was abolished twice. The second and final attempt occurred in 1848 through the Decree of Abolition. The decree set forth the rules of compensation, which granted 126 million francs to slave owners spread across seven colonies to be paid out over 20 years (French Republic (1849): 405-406).[14] Three of these territories were in the Caribbean region and are essentially still French colonies today: Guadeloupe, French Guiana, and Martinique. Unlike the British, the French did not categorize compensation claims by slave's occupation and they did not compensate unemployed slaves. Similarly to Britain, France based the compensation award at roughly 40% the slave market value from the period 1838-1848 (Blériot, 2000). The amount per slave received by slave owners in French Guiana was 619.1 francs, 469.6 francs in Guadeloupe, and 430.2 francs in Martinique, respectively (Ernatus (2009)). The French colonies did not have a period of forced labor after abolition (Beauvois (2016): 223).

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[12]Compensation was paid out from 1835-1843
[13]This also includes their colonies in Mauritius and the Cape of Good Hope.
[14]Reunion, Guadeloupe, French Guiana, Martinique, Senegal, Sainte-Marie, Nosy Be.

The Netherlands abolished slavery in 1863 in the Dutch Antilles: Aruba, Bonaire, Curacao, Saba, Sint Eustatius, Sint Maarten, and Suriname. The formula for compensation was based on the market value of goods each colony produced on average and did not differentiate between slave occupation nor age (Fatah-Black et. al. (2023): 167)[15]. Although this formula is different than the other islands, compensation still favored areas in which the plantation was growing. Slave owners in Suriname were rewarded 300 guilders per slave, 100 guilders in Sint Maarten, and 200 guilders for Curacao, Bonaire, Aruba, Saba, and St. Eustatius (Fatah-Black et. al., 2023). Today, Suriname is the only independent former Dutch colony in the Caribbean.

Denmark abolished slavery in 1848 in the Danish West Indies, which is now the US Virgin Islands.[16] Danish slave owners received 50 Danish West Indian dollars per slave as compensation for their freed property (Virgin Island History, n.d.), equivalent to 180 Danish Kroner. The government of Denmark originally proposed a 12 year apprenticeship period, but this was abandoned after only a year as ex-slaves refused to work under this system (Beauvois (2016): 174). Puerto Rican[17] slave owners were the biggest winners when Spain abolished slavery on the island in 1873.[18] The value of compensation was equal to the market price of slaves, where in other territories owners got less than 50% of the market value. However, compensation came in a mix of land grants and money. The system was designed to alleviate pressure on the colonial treasury and amounted to the value of 35 million pesetas in total (Knight, 2003). On top of money and land, owners also benefitted from a three year apprenticeship period (Beauvois (2016): 221). The estimated slave population of Puerto Rico in 1873 puts the per slave payment at 1130 pesetas (Beauvois, 2016). Sweden, in its West Indian colony of St.

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[15]The Dutch did pay slave owners 60 guilders per slave if the slave was promised manumission prior to abolition (Fatah-Black et. al. (2023): 167)

[16]The islands of St. John, St. Thomas, and St. Croix. USA bought the US Virgin Islands from Denmark in 1917.

[17]USA bought Puerto Rico from Spain in 1898

[18]It was not until 1886 that slavery was abolished in Cuba but slave owners did not receive financial compensation.

Barthelemy,[19], abolished slavery in 1847. The government rewarded slave owners with a total of 250,000 french francs (Knight, 2003) which is roughly 358.27 Swedish krona per slave according to the slave population estimated in 1847 ((Beauvois, 2016)).

3.2 Power and Control

Today, the group of people with the most economic and political influence in the Caribbean are foreigners from the USA and across Europe. However, there still remains a sizable class of elites, mostly ethnic minorities,[20] who remain within the region. The genesis of their power and control is directly linked with the transition to free labor and they benefitted from the compensation process. They were slave owners, facilitators of trade, political officials, insurers, etc. In many cases, these elites married within their small groups, and their last names have remained the same (Reid, 1977, 1980; Numa, 2018).

Carvalho and Dippel (2020) provides an interesting analysis on the evolution of political elites in the British Caribbean following abolition. The territories were self-governing during slavery and immediately following emancipation. Plantation owners, and other white elites such as lawyers, merchants, etc., were the political leaders. However, emancipation changed the demographics of the voters, as freed black slaves were now considered citizens. Black voters preferred to vote for the 'mixed' candidates, who were descendants of slave-owners and their slave mistresses. Unfortunately, the 'mixed' politicians were no different than their white counterparts. Both prevented expansion of education, health resources, labor and wage policies, etc. that would alleviate the social misery of the freed slaves. Across the middle of the 19th century, riots and strikes were common in the Caribbean. In response to the civil unrest, the white and mixed elites gave up their self-governing powers and officially established them-

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[19]Purchased by France in 1878.
[20]Jews, Syrians, and Europeans

selves as crown colonies of Britain.[21]

It became easier for the elites to maintain political and economic control when they were less visible. Clearly, skin color played a prominent role in class distinctions for these territories. Reid (1977, 1980) uses stock exchange reports for 1969-1973 to observe the top corporations in Jamaica. They find that the concentration of economic power is dispersed through 21 families who are ethnic minorities. The origin of power for these families is from the slave plantation and the transition out of slavery in the region. Their power and control has survived past abolition and the independence movement in Jamaica and they continue to exert political influence. Reid (1977) finds that 70% of corportate chairmen come from one of these families, and that there is not one corporation controlled by a black Jamaican although they made up 90% of the population in 1976.

The direct link from the plantation to current economic and political control is not just found in the British Caribbean. Numa (2018), finds the same for the French islands of Martinique and Guadeloupe. He shows that two European families, who are descendants of large slave-owners, remain in firm control of all stages of production: from imports to final consumption. The burden of the anti-competive nature of such monopolistic control ultimately falls on the citizens of these territories through higher prices and limited domestic investment. Compensation was essential for the preservation of power, as it helped them to diversify their investments into profitable multinational corpations folowing abolition (Constant, 1998; Kováts-Beaudoux, 2002; Vogt, 2005). Present-day Caribbean continues to be haunted by its past.

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[21]The only exception is Barbados. As we argue, the conflict between ex-slaves and owners were not as large in this territory.

4 Data

First, the West Indian territories of 1834 do not perfectly correspond with the territories today. For example, Guyana in 1834 was two colonies, Demerara-Essequibo and Berbice. St. Kitts and Nevis were also seperated, and Anguilla was an island district of the former. Likewise, Antigua and Barbuda are one territory today, but were split in 1834; so were Trinidad and Tobago. In the cases where territories have joined together, we compute a weight for the share of population in 1834 of the once separated territory to find the weighted average of each variable where it is necessary. This way we could link the past with the present without losing information about the differences between once separated islands.

Since my variable of interest is compensation, I must convert each amount into a common currency. The currency used throughout the paper is U.S. dollars. However, another complication arises due to monetary environment of mid 19th century. First, the classical gold standard was not established until 1873. In the period I analyze (1834-1873), most countries were still tied to gold, but some were tied to silver or both. Therefore, exchange rates were not fixed. Second, there were multiple discoveries of gold during this era, which devalued gold and created inflation. So, I must take into account the increase in prices and depreciation of currencies. The main compensation measure is compensation in 1873 $ ($comp_{i1873}$) constructed using Equation (1)

$$comp_{i1873} = currency_{ia} * \frac{\overline{CPI_{i1873}}}{CPI_{i}a} * xr_{i1873} \tag{1}$$

I take each compensation per slave measure at abolition in their colonizers currency ($currency_{ia}$) and adjust it to 1873 levels using the average increase in prices from each respective abolition (CPI_{ia}) year to 1873 (CPI_{i1873}).[22] Then, I convert each adjusted currency into U.S. dollars using the 1873 exchange rate (xr_{i1873}). A more detailed explanation of the construction of the

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[22]Average increase in prices is the average CPI of USA, UK, France, Sweden, Denmark, Spain, and the Netherlands.

Table 2: Summary Statistics

variable	mean	SD	N	min	max
ln gdp pc in 2019	10.046	0.547	28	8.833	11.287
ln comp (1873 $)	5.028	0.487	28	3.926	6.121
independent	0.464	0.508	28	0	1
hurricane belt	0.536	0.508	28	0	1
ln slave pct (1830)	-0.518	0.527	28	-2.207	-0.123
pop density / 1000 (1830)	.069	.067	28	0	.241
institutions index	0	1.672	25	-3.7	2.008
ln resource	5.153	2.173	20	2.026	9.315
self-governance	0.857	0.356	28	0	1

compensation variable is found in the Appendix (A).

Summary statistics are found in Table (2) and data sources are in the Appendix (A). The French, Dutch, and Spanish only compensated owners of employed slaves. To keep the measurements relative, I use average compensation for employed slaves for the British West Indies. Two caveats are for Bermuda and Anguilla, as only compensation for all slaves are available from House of Commons (1838). However, slave employment status and population for Bermuda was most similar to the Bahamas. Bahamian slave-owners received 1.2 times more compensation for an employed slave compared to the amount for the average of all slaves. I use this same ratio to compute compensation for employed slaves in Bermuda. Anguilla was a district of St. Kitts at the time, so they received the same compensation.

The measure of current economic conditions are the PPP adjusted current GDP per capita of 2019. Most of the data are from the Penn World Tables (Feenstra et. al. (2015)), but other sources were also used where this data was missing. All the territories were slave economies with low levels of income in the 19th century, so income per capita today is a good measure of long-run development. *Independent*, indicates if a country is independent today or not. Roughly, 46% of the countries in the study are independent. *Hurricane belt*, is a dummy variable that states if the territory is within the hypothetical hurricane belt. Territories falling

within this area, have a high likelihood of direct hits from strong hurricanes which can potentially harm development. Figure (2), shows this hypothetical area. Basically, St. Lucia and all territories south of it are outside the hurricane belt. *Slave pct*, is the percentage of

Figure 2: Atlantic Hurricane Belt

slaves in the populaton for 1830. *Pop density*, is the density of the total population in 1830. I divide this variabe by 1000. *Institutions index* is a Principle Component Analysis (PCA) index of 4 institutional variables: rule-of-law, regulatory quality, control of corruption, and government effectiveness. The PCA is constructed by creating an index from the average of each variable from 1996-2019. *Resource* is a variable that captures the presence of valuable natural resources within a territory. It is the per capita amount of exports in metals, gold, and oil on average for 1990-2019. Export data is taken from the Atlas of Economic Complexity (Atlas, 2022) and current populations are from the United Nations (UN, 2024a). Finally, *self − governance*, is an indicator for a territory having their own independent political institutions and decision-making. Some countries who are not independent might be self-governing.

5   OLS Estimation

Figure 3: Relationship between GDP per capita in 2019 and Compensation per slave (1873 $)
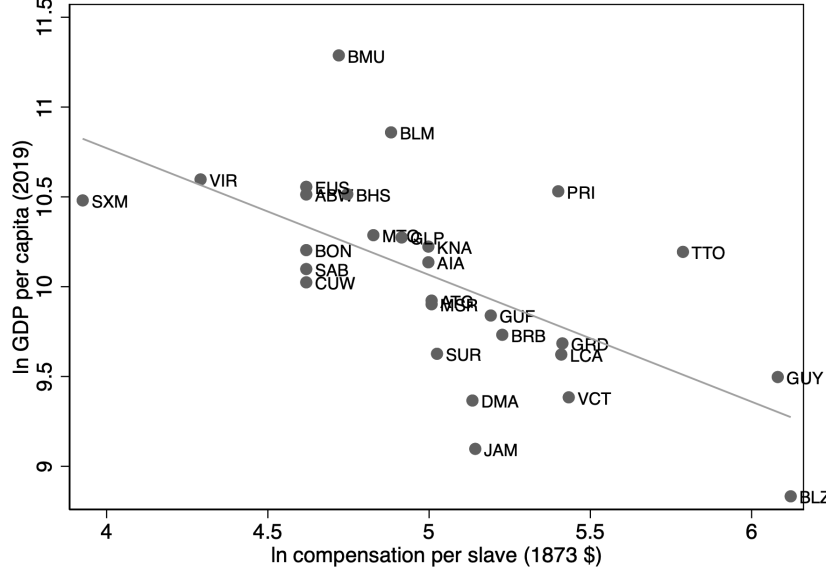

Figure (3) shows a negative relationship between compensation and current incomes. However, the exact formula and amount of compensation varied by colonizer, so colonizer fixed effects must be taken into account. Table (3) reports OLS regressions of log per capita GDP on the amount of compensation. The regressions are for the equation:

$$\ln gdp\,pc_{i2019} = \beta_0 + \beta_1 \ln comp_{i1873} + \mathbf{C}'_i\delta + \mathbf{X}'_i\gamma + \epsilon_i \tag{2}$$

$gdp\,pc_{i2019}$ is GDP per capita in country i for 2019, $comp_{i1873}$ is the compensation measure from Equation (1), $\mathbf{C}_i$ is colonizer fixed effects, $\mathbf{X}_i$ is a vector of covariates, and ϵ_i is the error term. For colonizer fixed effects, the British are used as the base and the rest indicate if its a French, Dutch, or U.S. colony.[23] β_1 is the coefficient of interest and is used to determine the association between incomes and compensation. All regressions have the same independent variable, compensation in 1873 USD, with the exception of column 2. In this column, I regress

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[23]Puerto Rico and the U.S. Virgin Islands are coded as U.S. colonies. St. Barthelemy is coded as a French colony. If we changed the identity to the original colonizers, the results would be unchanged.

GDP per capita on a set of dummy variables for three quantiles of compensation distribution. The purpose is to test if the relationship between incomes and compensation is linear. The base group is the set of territories in the lowest quantiles.

Table 3: OLS, Relationship between Compensation and Income

	(1)	(2)	(3)	(4)	(5)	(6)
			Dependent variable is ln gdp pc in 2019			
ln comp (1873 $)	-0.706***		-0.734***	-0.540**	-0.688***	-0.745***
	(0.171)		(0.215)	(0.226)	(0.220)	(0.254)
Dummy for comp in 2nd quantile		-0.522**				
		(0.210)				
Dummy for comp in 3rd quantile		-0.754***				
		(0.210)				
French colonizer			0.248	-0.0788	-0.0153	-0.0115
			(0.250)	(0.289)	(0.269)	(0.274)
Dutch colonizer			-0.129	-0.313	-0.448*	-0.489*
			(0.247)	(0.251)	(0.241)	(0.260)
USA colonizer			0.418	0.112	-0.178	-0.145
			(0.335)	(0.352)	(0.353)	(0.366)
independent				-0.488*	-0.310	-0.315
				(0.248)	(0.244)	(0.249)
ln slave pct (1830)					-0.374**	-0.360*
					(0.174)	(0.180)
hurricane belt						-0.0880
						(0.186)
Observations	28	28	28	28	28	28
R-squared	0.396	0.355	0.480	0.558	0.637	0.641

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Standard errors are in parentheses. OLS estimates of Equation (2) are reported. The dependent variable is the natural log of current per capita GDP in 2019. The compensation measure, ln comp (1873 $), is the amount of compensation per slave in 1873 US dollars using CPI adjustment according to Equation (1). Dummies for quantiles of compensation are used for estimation in Column (2), where the the 1st quantile is the base. Colonizer fixed effects are reported and the base colonizer is Britain. Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (2).

Column 1 shows there is a strong negative relationship between the compensation measure and current incomes. Figure (1) is a diagram of this regression. The dummy variables for compensation quantiles are shown in Column 2. The dummies are in the expected order and magnitude, which implies the linear specification is appropriate. Comparing the lower and upper third distribution of $comp_{1873}$ yields an average value of $98.29 and $275.89, repectively. Using coefficient from Column 1 suggests that there should be a 107% income difference between these sets of countries. In reality there is a 164% difference in incomes, which suggests that compensation explains a significant portion of income differences if we interepret the es-

timates as causal.

In Columns 3-6, I add colonizer fixed effects and various controls. La Porta et. al. (1999) and Landes (1998) both argue for the importance of colonial identity for development. None of the colonizer dummy variables are significant, which contrasts the previous studies. However, these results are in line with Acemoglu et. al. (2001). A dummy variable indicating current independence is used in Columns 4-6. Areas which are still territories of larger, wealthier nations such as the USA, France, UK, or the Netherlands, might enjoy various resources that would otherwise be more difficult to obtain. Therefore, independence is a relevant control for current development. Nonetheless, this variable is insignificant and does not change the significance of compensation.

The natural log of slave percentage of the population in 1830 is added as a covariate for Columns 5-6. Nunn (2007) and Engerman and Sokoloff (2002) have argued that the intensity of slavery has a major effect on long-run institutional and economic development as it is an extractive institution. However, I find the variable to only have a minimal effect on current incomes. The explanation for this is that the Caribbean is a slave region, just because there might be various percentages of slaves in each territory does not change the fact that indigenous populations were wiped out and the region was used solely for extractive purposes. The final specification is found in Column 6, where I add an indicator for hurricane belt along with the other controls. Territories which are most susceptible to direct hurricane hits might have obstacles to development. However, the variable is insignificant.

In all specifications, compensation is significantly negatively associated with current GDP per capita's. The coefficients suggest roughly a 0.75% decrease in current incomes due to a 1% rise in compensation. Although compensation for abolition happened almost 200 years prior to the measure of incomes, there might be reasons to not intepret the OLS estimation as

causal. The first issue is selection bias as compensation tended to favor the newer territories because they were in the middle of growing plantation production leading up to abolition. It is plausible that the older territories had a longer time to develop and were richer. However, they could not be much richer as they were still predominantly slave territories and older colonies suffered from greater soil exhaustion (Green (1991): Ch. Plantation Economy, 5). Even so, it is true that in the older territories the relationship between slaves and owners were relatively better, which might suggest improved development.

Secondly, our estimation most likely suffers from omitted variable bias because there are limited data availabality for the Caribbean region. However, we are dealing with a region who share a common history, geography, and culture. Therefore, there is less of a need to control for these factors. Nonetheless, these two concerns could be solved with an instrumental variables approach. Importantly, the instrument must account for variation in compensation without having a direct effect on current economic conditions. The instrument used in the next section is total population density in 1830.

6   Instrumental Variables

Data on British West Indian populations are from Higman (1995) and from Engerman and Higman (2003) for the other territories. Higman constructs measures from a variety of colonial documents. Total population density is total population (slaves + non-slaves) of territory i in 1830 divided by land area in kilometers squared and is specified by the equation below:

$$pop\,density_{i1830} = \frac{total\,population_{i1830}}{land\,area_i} \qquad (3)$$

During the debates over abolition, "owners in the more densely populated islands immediately protested" (Butler (1995): 28). It was known that compensation would favor the newer, less dense areas. In fact, dense areas favored a compensation formula based on the number of

slaves, while the sparse areas advocated a scheme based on market slave prices prior to abolition (Engerman (1984): 137). Logically, less dense areas might have a harder time keeping slaves on the plantation after abolition, so higher compensation made sense. The first-stage IV estimation is specified using Equation (4). Population density might not be the only determinant of compensation amounts, but it is proper instrument because it is a source of exogenous variation. The estimates of Equation (4) are then used for the second-stage estimation with Equation (2).

$$\ln comp_{i1873} = \alpha_0 + \alpha_1 (pop\,density/1000)_{i1830} + + \mathbf{C}'_i \eta + \mathbf{X}'_i \phi + \theta_i \qquad (4)$$

The IV results are shown in Table (4). Each column is a regression on the same sample, but with more controls added. In general, the coefficients of compensation are larger than those found in OLS, but the siginificance is the same. Panel B in Table (4) depicts the first stage IV estimates. In all specifications, $(pop\,density/1000)_{1830}$ has a significant negative correlation with compensation. This suggest that our argument that less dense areas had greater compensation is valid. Although not shown, the dummy for Dutch colonizer is negatively significant, which indicates that the Dutch had smaller amounts of compensation compared to the British. The F-stat for the first stage are also in Panel B. Column 2 is most significant with a statistic close to 10, but all specifications have a statistic greater than 5. Results from the Wu-Hausman test are insignificant, which might suggest the IV approach is unneccessary. However, given the potential for biases mentioned above, I think the IV is more appropriate than OLS.

Panel A of Table (4) shows the second stage results. Again, $\ln comp_{1873}$ is significant in all specifications. In Column 4 and 5, I find negative significance for $\ln slave\,pct_{1830}$. This finding is in line with arguments of Nunn (2007) and Engerman and Sokoloff (2002). The predicted values of Column 5 are compared with the actual GDP per capita values in Figure (4). There is almost a one to one relationship between the two which suggests that an increase

Table 4: IV, Relationship between Compensation and Income

	(1)	(2)	(3)	(4)	(5)
Panel A: 2nd Stage, Dependent variable is ln gdp pc in 2019					
ln comp (1873 $)	-1.133***	-1.089***	-0.950**	-1.226**	-1.300**
	(0.418)	(0.380)	(0.442)	(0.478)	(0.512)
independent			-0.291	-0.0133	-0.0865
			(0.300)	(0.336)	(0.299)
ln slave pct (1830)				-0.507**	-0.436**
				(0.201)	(0.180)
hurricane belt					-0.280
					(0.235)
Colonizer fixed effects		X	X	X	X
R-squared	0.252	0.419	0.492	0.534	0.556
Panel B: 1st Stage, Dependent variable is ln comp (1873 $)					
pop density / 1000 (1830)	-3.173**	-3.093***	-2.593**	-2.346**	-2.149**
	(1.276)	(0.997)	(0.997)	(1.011)	(0.909)
independent			0.338*	0.401*	0.284
			(0.192)	(0.198)	(0.184)
ln slave pct (1830)				-0.175	-0.0792
				(0.150)	(0.139)
hurricane belt					-0.319**
					(0.128)
Colonizer fixed effects		X	X	X	X
Adj. R-squared	0.161	0.491	0.534	0.541	0.632
F-stat	6.187	9.619	6.773	5.387	5.594
Observations	28	28	28	28	28

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. IV estimates of Equation (2) are reported in Panel A. First stage estimates from Equation (4) are in Panel B. The compensation measure, ln comp (1873 $), is the amount of compensation per slave in 1873 US dollars using CPI adjustment according to Equation (1). Colonizer fixed effects are used and the base colonizer is Britain. Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (2). The instrument used is the total population density of the territory in 1830 divided by 1000, pop density / 1000 (1830).

in compensation leads to an even greater decrease in current incomes.

Figure 4: Predicted values of GDP pc vs. actual GDP pc
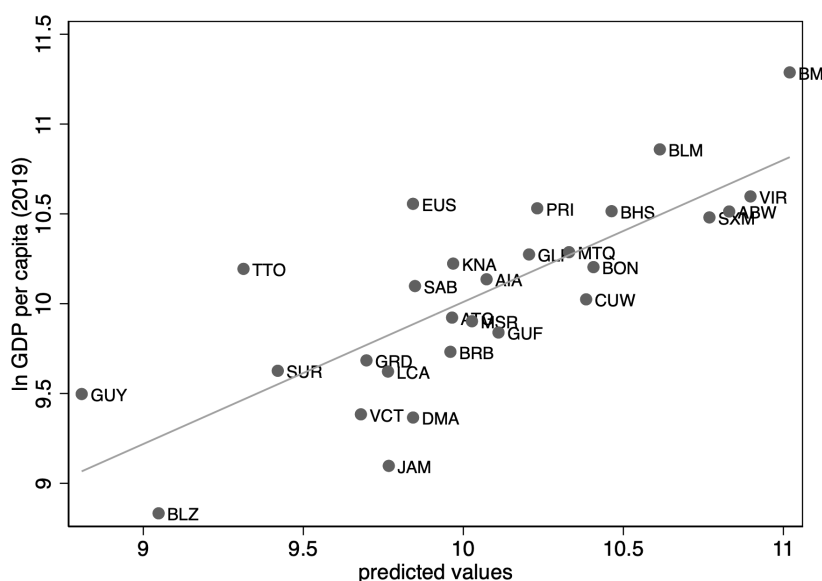
7 The Institutional Channel

Next, I analyze institutions as a potential channel in which compensation affects current incomes. Compensation hindered institutional development for two reasons. For one, slavery ended but the extractive institution of the plantation did not, and the purpose of the West Indian territories continued to be exporting cheap staple crops to the metropole. Internal dynamic of these territories were never given a chance to exist and largely do not exist today. Second, the two dominant classes were at complete odds. On one hand, owners had political and economical power. They did everything they could to maintain the plantation and never lessened their racial prejudices against the freed slaves. The freed slaves tried to reject the plantation for obvious reasons. To make matters worse, the compensation formula favored territories where slaves were treated more brutally. Compensation perpetuated the conflict between the freed slaves and owners. Also, there is a direct link from contemporary economic and political power to the plantation and the transition out of slavery as discussed in Section (3.2).

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Figure 5: Institutions Relationship with Compensation (left) and Income (right)
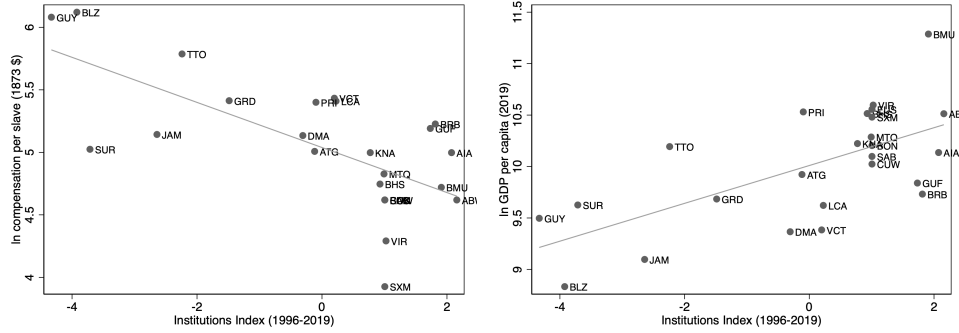

Figure (5), depicts the relationships between compensation and institutions in the left panel and current incomes and institutions in the right panel. Institutions index is created by a PCA with four insitutional variables as described in Section (6). There is a clear negative relationship between compensation per slave and institutions index. Likewise, institutions index and current incomes have a positive correlation. Acemoglu et. al. (2002) argue that institutions have an important causal effect on incomes.

Next, I observe the relationship between compensation, institutions, and current incomes in Table (5). Panel A are basic OLS regressions of institutions on compensation. In all specifications, $\ln comp_{1873}$ has a signicantly negative relationship with institutions index. In column 2 the independent variables of interest are the dummies for compensation quantiles. The quantiles are the expected magnitudes and signs, which suggests a linear relationship between compensation and institutions. Taking the average values of the first and third quantiles, $98.29 and $275.89, and combining it with the coefficient from Column 1, indicates an institutional difference of 2.24 units. The actual institutional difference between these two sets of countries is on average 2.10 units. Notice that countries which are independent have significantly weaker institutions. Also, though the coefficient for colonizer fixed effects are not shown, the Dutch colonies have significantly worse institutions today compared to the British.

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Table 5: Relationship between Compensation and Institutions

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS, Dependent variable is average institutions index from 1996-2019						
ln comp (1873 $)	-2.171***		-2.853***	-2.084***	-2.408***	-2.664***
	(0.503)		(0.618)	(0.562)	(0.588)	(0.672)
Dummy for comp in 2nd quantile		-1.637**				
		(0.764)				
Dummy for comp in 3rd quantile		-1.853**				
		(0.680)				
independent				-2.219***	-1.742**	-1.733**
				(0.687)	(0.742)	(0.749)
ln slave pct (1830)					-0.740	-0.663
					(0.502)	(0.515)
hurricane belt						-0.409
						(0.502)
Colonizer fixed effects			X	X	X	X
R-squared	0.448	0.282	0.562	0.717	0.748	0.757

	Indirect	Direct	Total			
Panel B: Mediation Analysis, Dependent variable is ln gdp pc in 2019						
comp (1873 $) quantile= 3 vs 1	-0.260**	-0.542**	-0.802***			
	(0.129)	(0.225)	(0.243)			
colonizer fixed effects	X	X	X			
Observations	25	25	25	25	25	25

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. Panel A reports OLS estimates using Equation (2), except institutions index is used as the dependent variable. Institutions index is a PCA comprised of the average of rule-of-law, control of corruption, government effectiveness, and regulatory quality from 1996-2019. Dummies for quantiles of compensation are used for estimation in Column (2), where the the 1st quantile is the base. The compensation measure, ln comp (1873 $), is the amount of compensation per slave in 1873 US dollars using CPI adjustment according to Equation (1). Colonizer fixed effects are used and the base colonizer is Britain. Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (2). Panel B reports coefficients from mediation analysis estimation. The dependent variable is the natural log of GDP per capita in 2019. In this analysis, I test the effect on incomes using the third quantile of compensation as the treatment and the first quantile as the control.

In Panel B of Table (5), I implement a mediation analysis to test whether the effect of compensation does work through institutions. Mediation analysis estimates equations for the mediator variable, in this case institutions index, and the outcome, which is current incomes. It then decomposes the causal effects of the treatment vs. control into indirect, direct, and total effects (Nguyen et. al. , 2022). The control group are those in the first quantile of compensation, and the treatment are those in the third quantile. I use the STATA command *mediate* to perform the analysis. As found in Panel A, compensation has a significant correlation with institutions. Likewise, both compensation and institutions have a significant correlation with current incomes, but with different signs, as expected. The decomposition of compensation's effect is found in Panel B. The total effect of a territory being in the third quantile of compensation vs the first, is a drop in current GDP per capita by 123%. 32.4% of this effect, or 39.9% of the drop in incomes is due to compensation's effect on institutions, while the rest is working beyond the effect of institutions. The estimates are comparable to those derived from Table (3).

7.1 Compensation to institutions

Two ways in which compensation connects to institutions are as follows: it kept the plantation alive and it favored areas in which slaves were treated the worst. Proof of the former is through recorded debates among government officials and colonial reports. We know the purpose of compensation was for the survival of the plantation. The latter can be proved through colonial data, birth rates minus death rates per 100 slaves, which I call population growth.[24]

Figure (6) depicts a negative relationship between slave population growth and compensation. Sources for the British colonies are from Higman (1995), Lamur (1981) for the Dutch colonies, and Lamur (1996) for French Guiana.[25]. Areas with lower population growth needed

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[24]Typically called the natural increase of the population, but there is nothing natural about slavery.

[25]There is no data for Belize and Bermuda. For the former I use a conservative estimate estimate of -.2% based on the slave population and import data. Slaves were known to be treated well in Bermuda so I use 1.2% as a conservative estimate (Bellhorn (1992): 12).

Figure 6: Relationship between Compensation and Slave Population Growth
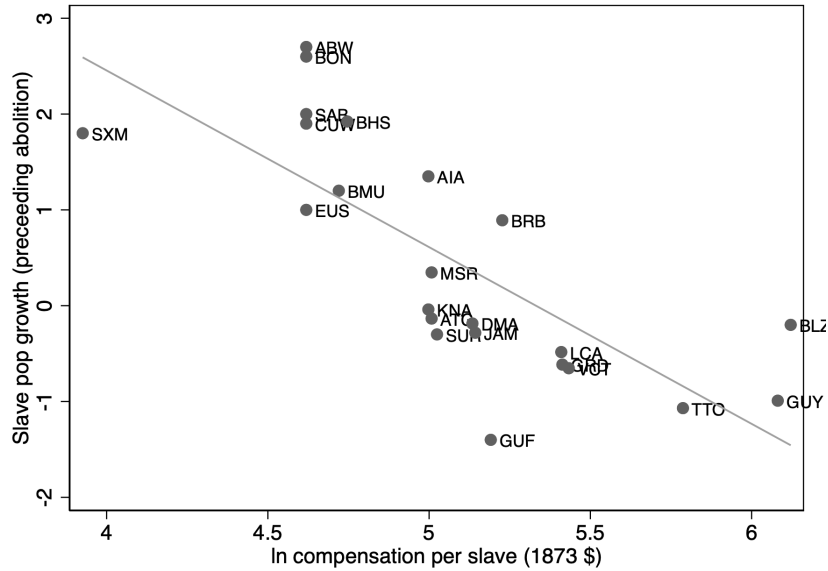
to replace their declining population. It is also likely that areas in which the plantation was growing had lower population growth because they were working their slaves harder and had less care about investing more money to replace them. They also happen to be the colonies which were furthest from slave markets, which adds to their price paid. John Mayers, colonial agent for Barbados argued that slave owners were being penalized for their 'kindness'. He claimed that compensation to Barbados was limited because slaves were well treated and reproduced their population without importation (Butler (1995): 29). OLS regressions estimate the relationship between compensation and population growth in Table (6). Although, there are only 23 territories with available data, I find a strong negative relationship between slave population growth and compensation, so the hypothesis that compensation favored the most brutal areas holds.

8   Robustness

I carry out multiple robustness and sensitivity analyses. First, population density only works as an instrument if it is an exogenous variation to compensation. Table (7) shows that population

Table 6: OLS, Relationship between Compensation and Population Growth

	(1)	(2)	(3)	(4)	(5)
	Dependent variable is ln comp (1873 $)				
slave pop growth	-0.309***	-0.270***	-0.230**	-0.335***	-0.247**
	(0.0586)	(0.0767)	(0.0988)	(0.103)	(0.106)
independent			0.152	0.122	0.0784
			(0.229)	(0.210)	(0.196)
ln slave pct (1830)				-0.424**	-0.155
				(0.196)	(0.229)
hurricane belt					-0.298*
					(0.154)
Colonizer fixed effects		X	X	X	X
Observations	23	23	23	23	23
R-squared	0.570	0.651	0.659	0.733	0.783

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. OLS estimates of Equation (2) are reported, except slave population growth (1830) is the independent variable of interest (replacing comp) and the natural log of compensation in 1873 $ (ln comp (1873 $)) is the dependent variable. Slave pop growth is birth rates minus death rates for the slave population in the period preceeding abolition for each respective territory. The compensation measure, ln comp (1873 $), is the amount of compensation per slave in 1873 US dollars using CPI adjustment according to Equation (1). Colonizer fixed effects are used and the base colonizer is Britain. Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (2).

density is exogenous, and only effects current incomes through compensation. The literature has argued that population density should be a good predictor for development (Acemoglu et. al. (2001)). However, the results here claim otherwise and it can be explained by the uniqueness of the Caribbean. The region was solely slave economies, high population densities does not mean there bustling towns and city-centers. Rather, it means that there were more plantations per area, which is not a symbol of development.

Next, I test the relationship between compensation and current incomes using alternative specifications of the IV estimation in Table (8). Columns 1-4 use the same regression as Column 5 in Table (3), but with different samples. Columns 1 and 2 are for different years, 1990 and 2000, respectfully. The further back in time, the more observations are lost, but the significance still holds. The results are similar across the years, however, it is interesting that the divergence in incomes caused by compensation is getting worse over time. The coefficients in 2019, 2000, and 1990 are -1.300, -1.284, and -0.938, respectively.[26]

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[26]However, with OLS regressions the coefficients are about the same.

Table 7: Test for Exogeneity of Instrument

	(1)	(2)	(3)	(4)	(5)
			Dependent variable is ln gdp pc in 2019		
ln comp (1873 $)	-0.605***	-0.586**	-0.414	-0.550**	-0.589*
	(0.188)	(0.255)	(0.258)	(0.243)	(0.285)
pop density / 1000 (1830)	1.677	1.555	1.388	1.586	1.527
	(1.363)	(1.455)	(1.378)	(1.264)	(1.311)
independent			-0.472*	-0.285	-0.288
			(0.249)	(0.242)	(0.248)
ln slavepct (1830)				-0.389**	-0.380**
				(0.172)	(0.179)
hurricane belt					-0.0532
					(0.187)
Colonizer fixed effects		X	X	X	X
Observations	28	28	28	28	28
R-squared	0.431	0.506	0.578	0.664	0.665

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Standard errors are in parentheses. OLS estimates for testing the exogeneity of my instrument, pop density / 1000 (1830) are reported. The dependent variable is the natural log of current per capita GDP in 2019. The compensation measure, ln comp (1873 $), is the amount of compensation per slave in 1873 US dollars using CPI adjustment according to Equation (1). The exogenous instrument is the total population density of the territory in 1830 divided by 1000, pop density / 1000 (1830). Colonizer fixed effects are used and the base colonizer is Britain. Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (2).

Column 3 limits the sample to areas of at least 50 km squared, to avoid potential biases from tiny territories. Due to the limited sample size of this study, I check for small-sample robustness in Column 4. This is done by dropping all observations with a Cooks distance score greater than 4/N.[27] The coefficient of compensation is significant in both columns. Although the first stage estimation is weak in Column 4. Nonetheless, the IV results in Table (8) are significant under OLS, too.

A new set of controls are introduced in colums 5 and 6. Self-governance indicates if a country has independent political institutions and follows the country list from UN (2024c). Resources signify valuable natural resources within a territory which potentially has a relationship with economic growth. Natural resources are an important export product for the region.

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[27]N refers to total observations, and is 28 in this case. This is the suggested cutoff level (Bollen and Jackman, 1990).

Table 8: IV, Compensation and Income with Alternative Specifications

	(1) 1990	(2) 2000	(3) area $> 50\ km^2$	(4) cook's d $> 4/N$	(5) Alt. control	(6) Alt. control
			Panel A: 2nd Stage, Dependent variable is ln gdp pc			
ln comp (1873 $)	-0.938**	-1.284***	-0.988**	-0.905**	-1.078**	-0.715**
	(0.427)	(0.414)	(0.388)	(0.450)	(0.481)	(0.362)
independent	-0.565**	-0.251	-0.184	-0.0187		
	(0.276)	(0.238)	(0.261)	(0.287)		
ln slave pct (1830)	-0.621**	-0.617***	-0.426**	-0.371**		
	(0.265)	(0.220)	(0.186)	(0.188)		
hurricane belt	-0.0133	-0.289	-0.313			
	(0.283)	(0.240)	(0.219)			
self-governance					-0.0259	-0.164
					(0.367)	(0.287)
ln resource						0.065
						(0.044)
R-squared	0.768	0.778	0.658	0.591	0.423	0.618
			Panel B: 1st Stage, Dependent variable is ln comp (1873 $)			
pop density / 1000 (1830)	-2.149**	-2.149**	-2.999***	-2.307*	-2.524**	-4.568**
	(0.909)	(0.909)	(0.996)	(1.121)	(0.952)	(1.842)
independent	0.284	0.284	0.292	0.395*		
	(0.184)	(0.184)	(0.172)	(0.215)		
ln slave pct (1830)	-0.0792	-0.0792	-0.136	-0.179		
	(0.139)	(0.139)	(0.144)	(0.160)		
hurricane belt	-0.319**	-0.319**	-0.480***			
	(0.128)	(0.128)	(0.133)			
self-governance					0.441**	0.351
					(0.195)	(0.211)
ln resource						0.544
						(0.497)
Adj R-squared	0.694	0.675	0.649	0.529	0.569	0.533
F-stat	12.223	9.270	9.067	4.240	7.020	6.149
colonizer fixed effects	X	X	X	X	X	X
Observations	18	22	24	27	28	20

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. IV estimates using different specifications of Equation (2) are reported in Panel A. The first and second column use the years 1990 and 2000 for the dependent variable of incomes. The third column restricts the sample to territories who are larger than 50 km^2. Column 4, drops all observations with a cook's distance score greater than 4/N. The only territory dropped is Bermuda. Columns 5 and 6 use a different set of controls: self-governance indicates if a country has their own elected government today, and the natural log of resource is the average per capita export value of gold, oil, and valuable metals from 1990-2019. The corresponding first stage estimates are in Panel B. The compensation measure, ln comp (1873 $), is the amount of compensation per slave in 1873 US dollars using CPI adjustment according to Equation (1). Colonizer fixed effects are used and the base colonizer is Britain. Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (2). The instrument used is the total population density of the territory in 1830 divided by 1000, pop density / 1000 (1830).

Bauxite is extracted and exported in Jamaica, oil in Trinidad and St. Vincent, and gold in the Guyanas (Guyana, French Guiana, and Suriname). In both specifications of the additional controls, compensation still significantly affects current incomes.

Table (9), uses different measurements of compensation as the dependent variable and estimates the same regression as Column 5 in Table (4). xr is the exchange rate to USD for each currency at the time of their abolition. PPP is a measure of compensation based on the average price growth from abolition to today and adjusted using 2019 PPP conversions. 1873 is similar to the measure used throughout the paper but instead of average CPI, I use CPI for each respective colonizer and convert to USD using 1873 exchange rates. $1850\,(Sweden)$ uses the historical currency database (Edvinsson, 2016) to convert abolition year compensation amounts to the value of the USD in Sweden in 1850. Finally, $1873\,\$\,new$ uses average total slave compensation for the British West Indies instead of average employed slave compensation. A more detailed explanation of the measurements are in the Appendix (A). For all measurements of compensation, the coefficient is negatively significant and of similar magnitudes.

9 Conclusion

Compensation for abolition has a persistent negative effect on current incomes. Areas which were compensated more had greater demand for slaves during the period leading up to abolition. They were more reliant on the system of slavery that allowed them to view their property as subhuman. Therefore, upon abolition these territories had less compatability between the two classes of the economy: the owners wanted to continue to expand production but freed slaves rejected the plantation. Compensation allowed the legacy of slavery to continue by keeping and even expanding the resources of the planter class. In the areas with more conflict, owners still used methods of coercion to keep freed slaves on the plantation. Also, the wealthiest families of the Caribbean have their origins of fortune in the transition from slavery and

Table 9: IV, Compensation and Income with Different Compensation Measures

	(1)	(2)	(3)	(4)	(5)
compensation measure:	xr	PPP	1873	1850 (Sweden)	1873 $ new

Panel A: 2nd Stage, Dependent variable is ln gdp pc in 2019

ln comp	-1.304**	-1.220**	-1.313**	-1.341**	-1.245**
	(0.545)	(0.473)	(0.524)	(0.531)	(0.495)
independent	-0.0402	-0.114	-0.0733	-0.0781	-0.101
	(0.331)	(0.287)	(0.307)	(0.303)	(0.298)
ln slave pct (1830)	-0.553**	-0.444**	-0.457**	-0.417**	-0.424**
	(0.215)	(0.179)	(0.186)	(0.178)	(0.180)
hurricane belt	-0.244	-0.253	-0.277	-0.298	-0.294
	(0.238)	(0.224)	(0.237)	(0.241)	(0.241)
R-squared	0.500	0.569	0.544	0.551	0.547

Panel B: 1st Stage, Dependent variable is ln comp

pop density / 1000 (1830)	-2.143**	-2.290**	-2.128**	-2.083**	-2.243**
	(1.001)	(0.943)	(0.921)	(0.887)	(0.952)
independent	0.319	0.280	0.291	0.282	0.285
	(0.203)	(0.191)	(0.186)	(0.179)	(0.193)
ln slave pct (1830)	-0.168	-0.0910	-0.0944	-0.0624	-0.0731
	(0.154)	(0.145)	(0.141)	(0.136)	(0.146)
hurricane belt	-0.290*	-0.318**	-0.313**	-0.323**	-0.344**
	(0.141)	(0.133)	(0.130)	(0.125)	(0.134)
Adjusted R-squared	0.385	0.446	0.519	0.698	0.547
F-stat	4.580	5.897	5.337	5.5180	5.556
colonizer fixed effects	X	X	X	X	X
Observations	28	28	28	28	28

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. IV estimates with different compensation per slave measures using Equation (2) are reported in Panel A. The corresponding first stage estimates are in Panel B. In Column 1, compensation is simply in US $ at each abolition year using the respective exchange rates. Column 2, compensation is the PPP adjusted 2019 values using current CPI. Column 3, compensation is similar to my main measure, but rather than take the average 'world' CPI, I take the CPI for each colonizer. Therefore, each territory has a unique price index dependent on their colonizer. In Column 4, compensation is measured as the value in $ in Sweden in 1850. I used the Historical Currency Converter for this calculation (Edvinsson, 2016). Laslty, Column is the same as our main measure, except I used the average per slave compensation for British colonies, rather than the average per employed slave value as used throughout the paper. Colonizer fixed effects are used and the base colonizer is Britain. Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (2). The instrument used is the total population density of the territory in 1830 divided by 1000, pop density / 1000 (1830).

benefitted from the compensation process (Numa, 2018; Reid, 1977, 1980). These families were benficiaries of the plantation system and continue to exert influence in the region.

Still, in low compensation colonies, power and wealth were maintained in the planter class. However, these areas did not have the same degree of antagonism as the high compensation territories. For some islands, like the Bahamas, Bermuda, and St. Barthelemy, slaves did a variety of jobs and were not confined to the plantation. Thus, slaves were treated relatively better than the rest of the West Indies. Since there were limited plantations and some compatibality between slaves and owners, the environment of these territories were not disrupted from abolition. In the old sugar colonies like those of Barbados, St. Kitts, Guadeloupe, and Martinique, plantation production was prominent but slaves were not mistreated to the same level as some of the other areas. Therefore, the plantation was not destroyed by abolition because slaves and owners already had a relatively compatible relationship. Although plantation production is not suitable for long-run growth, the compatibility allowed proper institutions to develop which could foster development in the future. In some colonies, like Trinidad and Tobago, Guyana, and Suriname the class relationship was altered by the immigration from East Indian indentured labor. Although slaves and owners were at odds, the new source of labor helped the plantation thrive. However, conflict still existed that has affected institutional development and current incomes.

There are a few drawbacks to the current study. One is the limited observations, which prevent the use of additional control variables. However, since we are dealing with a similar set of countries, there is less need for a wide set of controls. Another drawback is the data. I rely on 19th century colonial office slave data from various sources, and of course the validity of such reports could be questioned. Also, I have attempted to provide justification for conservative estimates in places where countries are missing data. However, just because these drawbacks exist should not call into question the robustness of the results presented.

A key takeaway from this article is that the transition out of slavery has a persistent effect. Engerman (1984) argues that population density was the key to economic adjustment directly following slavery. I assert that it is also a determinant of compensation, which has persistently adversely affected the territories. In the whole region slavery was dominant, but upon abolition there were different degrees of conflict between slaves and owners. The most incompatible areas received the highest compensation. Therefore, the plantation continued to be forced on people who rejected it. This process represents the power relations of the Caribbean islands, prevents proper institutional development, and still harms current incomes to this day.

Even deeper, the paper raises questions about global development and reparations for descendants of slaves. Abolition freed Africans from slavery, but the process of abolition showed no care for them as humans. Compensation to slave-owners was a deliberate government policy, that has had damaging effects to countries in the Caribbean. Yet, the wrongdoings have never been made right. While true that areas which Europeans settled established better institutions, extractive areas such as plantation economies were *still* European constructed societies as argued by Acemoglu et. al. (2001). The only difference was the purpose for the two types of colonies.

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A   Appendix: Data Sources and Compensation Construction

Each compensation measure is calculated using Table (10). The second column shows compensation per slave in the colonizers currency. Next are exchange rates to US dollars, one is for 1873 and the exchange rate for the abolition year is in parantheses. Column 4 are the CPIs for each colonizer at the abolition, and I treat 1873 as the base year. Column 5 and 6 have the CPI (base year still 1873) and PPP for each colonizer in 2019. The notes in the final column outline any adjustments that need to be made when converting the compensations to 2019 PPP.

The main measure of compensation used in this study, $comp$, is constructed by multiplying three variables. Compensation in each respective currency, exchange rate in 1873, and ratio of 1873 CPI to average abolition year CPI. USA CPI is not shown in the table but it is included in average CPI. $comp\,xr$ is constructed by muliplying compensation by 1873 exchange rates. $comp\,ppp$ takes the ratio of 2019 CPI to abolition year CPI for each colonizer and divides it by the PPP in 2019. This number is multiplied by compensation, which has been adjusted according to the notes in Table (10). $comp\,1850$ is constructed using the History Currency Database (Edvinsson, 2016). Finally, $comp2$ is the same measurement at $comp$, but I used total average slave compensation for the British West Indies, instead of average employed slave compensation.

Table 10: Compensation Construction

Territory	Compensation per slave	Exchange rate 1873 (abolition)	CPI abolition (1873=100)	CPI 2019	PPP 2019	notes
Anguilla	19.8 pounds					
Antigua and Barbuda	20 pounds					
The Bahamas	15.4 pounds					
Barbados	24.9 pounds					
Belize	60.9 pounds					
Bermuda	15 pounds					
Dominica	22.7 pounds					
Grenada	30 pounds	1 pound=5.546 USD (4.64 USD)	92.19	8926.18	0.67	
Guyana	58.5 pounds					
Jamaica	22.9 pounds					
Montserrat	20 pounds					
St. Kitts and Nevis	19.8 pounds					
St. Lucia	29.9pounds					
St. Vincent and the Gren.	30.6 pounds					
Trinidad and Tobago	43.6 pounds					
Aruba	200 guilders					
Bonaire	200 guilders					
Curacao	200 guilders					In 2002, the Netherlands adopted the euro at a rate of 1 euro=2.204 guilders
Saba	200 guilders	1 guilder=0.460 USD (0.599 USD)	87.87	2241.63	0.767	
St. Eustatius	200 guilders					
Sint Maarten	100 guilders					
Suriname	300 guilders					
French Guiana	619.1 francs					In 1960, the new franc was introduced at a conversion of 1 new franc=100 old francs. In 2002, France adopted the euro at 1 euro=6.560 new francs
Guadaloupe	469.6 francs	1 franc=0.217 USD (0.191 USD)	69.91	236938.12	0.706	
Martinique	430.2 francs					
Danish West Indies	180 Danish Kroner	1 kroner=0.303 USD (0.275 USD)	78.34	6118.91	6.538	Owners were paid in West Indian Daleres. 1 West Indian Dalere=3.6 kroner
Puerto Rico	1130 peseta	1 peseta=0.196 USD	100	69350	0.604	In 2002, Spain adopted the euro at 1 euro=166.386 pesetas
Swedish West Indies	358.27 krona	1 krona=0.306 USD (0.266 USD)	75.11	5285.71	8.584	

Table 11: Data Sources

Variable	Description	Source
GDP per capita (PPP)	Current GDP per capita puchasing power parity basis. Used for years 2019, 2000, and 1990	Most territories are Penn World Tables (Feenstra et. al., 2015). Puerto Rico, US Virgin Islands, and Curacao are from World Development Indicators (World Bank, 2024). Saba, St. Eustatius, and Bonaire are from Statistics Netherlands (2024b). French Antilles are from INSEE (2024).
Compensation amount	Amount colonizers paid slave owners per slave in their respective currencies	British West Indies (Higman, 1995), Dutch West Indies (Fatah-Black et. al., 2023) , French Antilles (Ernatus, 2009), Danish West Indies (Virgin Island History, n.d.), Swedish West Indies ((Beauvois, 2016)), Puerto Rico (Beauvois, 2016).
1873 Exchange rates	1 currency to USD in 1873	Exchange rates for Spanish peseta and British pound are from Officer (2024). Exchange rates for Swedish Krona, Danish kroner, Dutch guilder and French Franc are from Edvinsson et. al. (2010).
Historical CPI	CPI for abolition year, 1873,and 2019. Used to construct measures for inflation adjusted compensation.	USA CPI (Officer and Williamson, 2024), Spanish CPI (Prados-de-la-Escosura, 2024), UK CPI (Clark, 2024), French CPI prior to 2011 (Piketty and Zucman, 2014), French CPI after 2010 (World Bank, 2024), Swedish CPI (Statistics Sweden, 2024), Dutch CPI prior to 1914 (Smits et. al., 2000), Dutch CPI after 1913 (Statistics Netherlands, 2024a), Danish CPI prior to 1914 (Grytten, 2003), Danish CPI after 1913 (StatBank Denmark, 2024) .
2019 PPP Conversions	PPP conversions for 2019	ICP (2021)
Slave percentage	Slave population divided by total population in roughly 1830	British West Indies (Higman, 1995) and the rest are from Engerman and Higman (2003)
1830 slave population	Total population in slavery in 1830. Divide by slave pct to get total population.	British West Indies (Higman, 1995) and the rest are from Engerman and Higman (2003)
Land area	Land area of territory in kilometers squared	CIA (2024).
Colonial dummies	0 if British colony, 1 if French, 2 if Dutch, 3 if USA.	UN (2024b)
Independent dummy	0 if still a colony, 1 if independent in 2019	(US State Dpt , 2024)
Hurricane belt dummy	1 if within the hypothetical hurricane belt, Figure (2), and 0 if not	https://www.thetimes.co.uk/travel/advice/when-is-hurricane-season-in-the-caribbean-0h8xfm6qd
Self-governing dummy	1 if there is some form of self-governance 0 if not	UN (2024b)
Resource	Per capita export value of gold, oil, and metals on average from 1990-2019	Exports: Atlas (2022), Current Population: UN (2024a)
Institutions index	Standardized PCA index of four insititutional variables, which are all averages from 1996-2019: Rule-of-law, government effectiveness, control of corruption, and regulatory quality.	Kaufmann and Kraay (2023)
Slave population growth	Birth rates minus death rates for the years preceeding abolition in each territory	British West indies (Higman, 1995), Dutch West Indies (Lamur, 1981), French Guiana (Lamur, 1996).