

DISSERTATION

THREE ESSAYS IN CARIBBEAN POLITICAL ECONOMY

Submitted by

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In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Spring 2025

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ABSTRACT

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Economic literature on regional development is mostly concerned with Asia, Europe, Africa, or Latin America. Few studies have focused on the Caribbean, despite the region having unique characteristics. The distinct history, demographics, geography, and size of the region require specific focus. This dissertation aims to fill this intellectual gap by analyzing various aspects of the region related to development, international trade, and central banking. The objective is to shed light on the position and evolution of Caribbean countries in the international economic order, and to offer insights for the potential of long-run development in the region.

The following dissertation is organized into three chapters. In Chapter 1, I argue that the transition out of slavery is vital for contemporary development in the Caribbean. Specifically, I investigate the long-term economic consequences of compensation payments made to slave owners during the abolition of slavery in the 19th-century Caribbean. These payments, calculated based on slave prices influenced by local market conditions and distances to exporting slave markets, disproportionately benefited plantation economies that relied on extractive practices. While intended to facilitate the transition to free labor, compensation entrenched plantation systems, preserved elite dominance, and hindered structural economic transformation. Using historical data, I exploit the variation in compensation per slave amounts determined by distance to slave markets with an instrumental variables approach. I find that higher compensation per slave payments causes significantly lower GDP per capita in 2019 for 28 Caribbean territories. Mediation analysis reveals that approximately one-third of this negative effect operates through institutional persistence, as compensation perpetuated extractive institutions and conflict between elites and much of the population. The results also carry broader implications for modern debates on reparations and institutional reform, underscoring the enduring economic consequences of historical policies.

Chapter 2 explores Arthur Bloomfield's, an American money-doctor, mission to the Caribbean Islands and is co-authored with Guy Numa. Money-doctors played a crucial role in establishing and advising central banks in underdeveloped countries in the 20th century. However, the Bretton Woods order transformed the doctors' prescriptions after the second world war. Arthur Bloomfield was a part of this "new generation" who attempted to equip central banks with wide-ranging policy tools in contrast to the rigid instruments proposed by the previous generation of experts. Bloomfield's assignment to the British West Indies in 1960-1961 is important because it is an example of the change in vision of US foreign monetary policy. A significant characteristic of the new tradition was to let the environment of the country or region determine the exact approach of central banking. Therefore, the political and economic conditions of the West Indies, and the efforts to achieve regional integration and gain independence, were a principal consideration for Bloomfield and his advice for the region.

In Chapter 3, I develop a North-South growth model that integrates balance-of-payments constrained growth (BPCG) theory with insights from Arthur Lewis and Ragnar Nurkse. While BPCG models emphasize income elasticities of trade as key drivers of uneven development, Lewis and Nurkse highlight the role of domestic sector productivity in shaping long-term growth. I extend the BPCG framework to show that low internal productivity in the South weakens income elasticities and terms-of-trade, which hampers the prospects of convergence with the North. Using empirical estimates from 1985–2019, I demonstrate that elasticity ratios—determined by domestic productivity—are a critical factor in economic divergence. The findings suggest that improving internal productivity is essential for sustained growth and reducing income disparities between the North and South. The model can help explain the shortcomings of mass tourism in driving economic convergence for Caribbean islands.

ACKNOWLEDGEMENTS

I have been fortunate to be surrounded by great people throughout my life. This dissertation would not have been possible without the support, guidance, and encouragement of many people, and I am deeply grateful for their contributions to this journey.

First and foremost, I want to express my deepest gratitude to my parents, Dean and Gina, and my brother, Pat, whose unwavering support and sacrifices have made this achievement possible. I am also thankful for my partner, Alexa, who has dealt with all of my annoyances. Thank you for your patience, love, and steadfast support throughout this process—I could not have done this without you.

I am especially grateful to my advisor and friend, Guy Numa, for his invaluable guidance, mentorship, and encouragement. His insightful feedback and commitment to my growth as a scholar have profoundly shaped my work. Your unwavering support and patience have been instrumental in my success, and I am deeply grateful for every moment we spent together.

To Daniele Tavani, you have inspired and motivated me to improve my scholarly endeavors. I recall coming to you for guidance as a self-doubting first-year student, and you told me to pursue research “*that you care about.*” This advice has shaped the path of my studies. Also, thank you to Elissa Braunstein—I always felt comfortable approaching you with questions or concerns. Your trusting guidance and support has made a lasting impact on my career. To Anthony Roberts, I’m grateful for the time we spent together and the opportunity to work with you. Your comments and suggestions have had greatly improved my dissertation.

I thank all professors that I had the pleasure to learn from during my time at Colorado State. Special thanks to Ray Miller, Ramaa Vasudevan, Alex Bernasek, Anders Fremstad, Ed Barbier, and Sammy Zahran, who have all been inspirations for me as I start my career.

I would also like to thank my colleagues at the Center for the History of Political Economy at Duke University with whom I had the pleasure of spending a year with. Steven Medema, Bruce

Caldwell, Kevin Hoover, Roy Weintraub, Rafaël Lazega, Matilde Ciolli, Juliette Blayac, and others—thank you for your support, constructive feedback, and friendly conversations.

This dissertation, and my PhD degree, would not be possible without the love and support of my fellow graduate students in the econ department. Austin, Satyaki, Sid, Deb, Vinícius, Thomas, Brooke, Kendall, Greg, Paula, Luke, Taís, Saniya, Jeremy, Sean, Arifa, Doubra, and others, thank you! A special shout out to my friend Vinícius, with whom I'm grateful to have shared the PhD process with.

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Chapter 1

The Persistent Effects of Compensation for Abolition: Revisiting the Economic Legacy of Colonial Policies

1.1 Introduction

Economic history is replete with examples of institutions and policies that cast long shadows over modern economies. Few historical processes exemplify this better than the abolition of slavery in the 19th century. Across the West Indies, abolition was accompanied by the payment of financial compensation to slave owners, ostensibly to ease the transition to free labor. However, while compensation facilitated the continuity of plantation production, it also entrenched extractive institutions that would shape the economic and social trajectories of these territories. This paper investigates the long-term economic effects of abolition compensation, finding that it has had a persistent and negative impact on contemporary economic performance in the Caribbean.

Existing literature has established that slavery, as an extractive institution, is associated with poor long-run development outcomes ([Engerman and Sokoloff, 2002](#); [Nunn, 2007](#); [Acemoglu et al., 2012](#); [Althoff and Reichardt, 2024](#)). However, less attention has been paid to the mechanisms through which the transition out of slavery perpetuated inequality and economic stagnation. Compensation—intended to reimburse slave owners for the “loss” of enslaved labor—not only preserved the power and wealth of plantation elites but also reinforced the plantation economy, leaving freed slaves with limited opportunities for mobility. By incentivizing the continuation of plantation systems, compensation delayed structural transformation and exacerbated institutional conflicts between elites and the broader population.

The Caribbean has historically received less scholarly attention in the economic history literature due to significant data limitations. Many territories lack consistent historical records, and

economic studies often focus on broader regional trends or individual case studies, overlooking the nuanced dynamics within and across Caribbean nations. This gap is critical to address, given the region's stark inequalities in income and institutional quality, which persist to this day. Understanding the historical origins of these disparities, particularly the role of transitional policies like abolition compensation, is essential to explaining why some territories have fared better than others in terms of economic development.

To quantify these effects, this paper utilizes a novel empirical strategy. Specifically, I exploit the formula for compensation for an instrumental variables approach. The formula granted compensation per slave based on the price per slave in the period before abolition. I use minimum distance to slave markets as an instrument for compensation because distance increases the cost of acquiring enslaved labor. Using historical data on compensation, slave populations, and colonial institutions, I estimate the causal relationship between abolition-era compensation and current levels of economic development, as measured by GDP per capita in 2019. The findings indicate a significant negative effect: higher compensation per slave payments lead to lower contemporary income levels. Mediation analysis further reveals that a third of this effect operates through the persistence of poor institutions.¹ The argument is outlined in Figure (1.1). My estimates are robust to different years, control variables, samples, instruments, and measurements.

This study contributes to several strands of economic literature. First, it advances our understanding of the persistence of colonial institutions, building on foundational works by [Acemoglu et al. \(2001\)](#) and [Engerman and Sokoloff \(1997\)](#) and more recently by [Nunn \(2008\)](#), [Dell \(2010\)](#), [Iyer \(2010\)](#), and [Bruhn and Gallego \(2012\)](#).² Second, it highlights the importance of transitional policies—such as compensation—in shaping long-run development trajectories, a topic often overshadowed by broader discussions of slavery and colonialism. Lastly, it provides new insights into the economic history of the Caribbean, emphasizing the role of institutional conflict and elite continuity in the region's development. The Plantation Economy School of the Caribbean argues that

¹I define institutions according to the definition of [North \(1990, p. 3\)](#), “Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction.”

²See [Nunn \(2020\)](#) and [Abad and Maurer \(2021\)](#) for an overview of this literature.

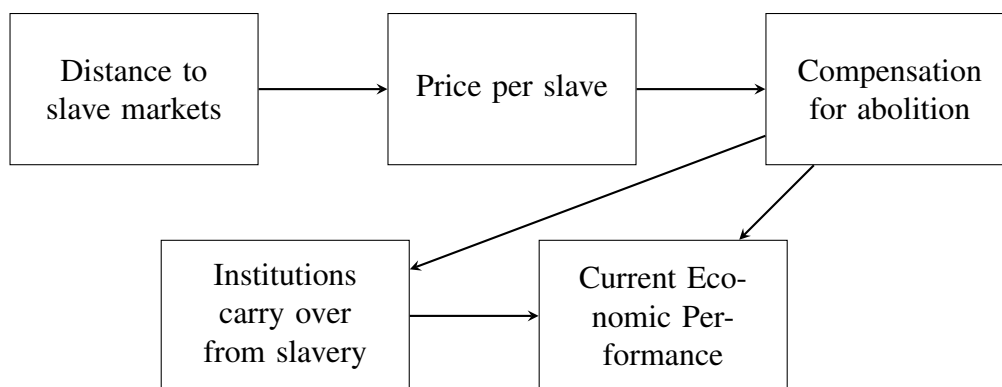


Figure 1.1: Schematic Summary

Notes: The figure depicts the argument of this paper. Minimum distance to slave markets is the instrument which determines the amount of compensation. The intuition behind this connection is that compensation per slave amounts were based on the price paid per slave in the period preceding abolition, which was greater the further one had to travel to purchase slaves. Compensation then causally effects current economic performance, with part of this impact working through its effect on institutional development.

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.

The results have broader implications for contemporary debates on reparations, institutional reform, and the economic legacy of slavery. By shedding light on how historical compensation schemes undermined long-term development, this paper underscores the importance of addressing structural inequalities rooted in colonial-era policies. The lessons of the past offer valuable guidance for fostering inclusive growth in societies still grappling with the legacies of slavery and colonialism.

The following section provides 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 (1.5) addresses the issue of causality by using distance to slave markets as an instrument for compensation. I then analyze analyze potential channels by which compensation affects contemporary economic performance. I perform various robustness checks on the results in Section (1.7) and Appendices (A.5, A.6, A.7). Finally, I conclude with considerations of the novelty and drawbacks of the study in Section (1.8).

1.2 The Great Experiment

Slavery ended after a long process of abolitionist movements by humanitarians, economists, and slaves. Humanitarians viewed it 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, p. 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 necessary corollary to abolition in order to maintain the colonial outposts (Beauvois, 2016, ch. 3). The plantation lived on, and the same institutions which it was built upon continued to survive.

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.³ In total, this analysis comprises 28 territories of the six colonizers mentioned.⁴ The movement out of slavery favored slave-owners by granting compensation and an apprenticeship period. Compensation was a one-time payment to slave owners, and others with financial ties in slavery. Colonizing governments took on large loans to fund the payments, which were repaid through public taxation in the following decades.

I briefly describe the compensation process in Appendix (A.8). The most comprehensive overview 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.

³The 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, p. 2).

⁴Cuba, Haiti, and the Dominican Republic are not part of the main results. Cuban slave owners did not receive compensation, and Haiti/Dominican Republic ended slavery through revolutions. However, I do consider the case of Haiti in Appendix (A.7), as the island was forced to pay slave-owners.

The experience of the transition from slavery was heterogeneous 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, p. 142). 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, p. 592); (Green, 1991, ch. The Apprenticeship).

Another strategy by owners was the rent-wage system. 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 plantation 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, p. 595). Owners also privatized the fertile lands and prevented ex-slaves who left the plantation from gaining access (Bolland, 1981, p. 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 (Bolland, 1981, p. 606).

The political and economic power of the slave-owners was aided by compensation. Low population density created disruptions to the plantation, but owners combated them by making it illegal 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 on slaves through the above mentioned legal measures with varying degrees of success. These great lengths to sustain the plantation were 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.

1.2.1 Country Backgrounds

Table (1.1) gives an overview of the the slave territories analyzed in this study averaged by their colonizer. The full breakdown of the colonies is found in Appendix (A.9).⁵ Column 1 has the name of each colonizer with the date of abolition in parentheses.⁶ 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.

Table 1.1: Territory Backgrounds

Colony	GDP pc (2019)	Slave pop (1830)	Comp. (1873)	Comp. (2019)	Slave %	Apprenticeship
<i>Britain (1834)</i>	22481	663127	216.45	4194.46	81%	1834–1838
<i>The Netherlands (1863)</i>	28546.26	61932	138.05	4109.89	73%	-
<i>France (1848)</i>	25690.80	202890	135.5	3360.55	80%	None
<i>Danish West Indies (1848)</i>	40021.78	26879	73.07	2150.89	65%	1848–1849
<i>Puerto Rico (1873)</i>	37453.79	34240	221.48	7808.4	11%	1873–1876
<i>Swedish West Indies (1847)</i>	52000	1387	131.89	2939.19	35%	None
Total	26556.67	990455	191.13	4086.07	65%	-

Notes: There are a total of 28 territories in this study with 15 coming from British colonies, 7 from Dutch, and 3 from French. 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 (1.3) and Appendix (A.3)). Lastly, apprenticeship period refers to the years following abolition where slaves remained tied to their slave owners.

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

⁵The 28 territories of this study all had the same abolition process, as they used mass compensation. Other territories near the region, such as Mexico, Guatemala, Colombia, and Venezuela are not part of the study because they did not follow the same process.

⁶The 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.

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

Columns 4 and 5 are the amount of compensation per slave in U.S. dollars using 1873 and 2019 as base years, respectively. The construction of these variables are covered in Section 1.3 and more deeply in Appendix (A.3). On average, colonizers granted slave owners between \$2,000 and \$8,000, adjusted to 2019 PPP levels.⁷ Multiplying the total slave population by the average amount of compensation per slave 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. There is no relationship between slave percentage and compensation. Compensation was based on the price paid per slave in the preceding period of abolition for each colonizer, not the demographic makeup. Finally, in the last column we have the apprenticeship period for each colonizer (Beauvois, 2016, p. 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, p. 193).

⁷Part of Puerto Rico's compensation was through land grants, which explains their high compensation amounts.

The Dutch only enforced apprenticeship in their colony of Suriname, which was growing their plantation production at the time of abolition. France and Sweden did not establish apprenticeship.

1.3 Data

First, the West Indian territories of 1834 do not perfectly correspond with the territories today. For example, Guyana, Antigua and Barbuda, Trinidad and Tobago, and St. Kitts and Nevis were split in 1834, but are one territory today. 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 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 (1.1)

$$comp_{i1873} = currency_{ia} * \frac{\overline{CPI}_{i1873}}{CPI_{ia}} * xr_{i1873} \quad (1.1)$$

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 (\overline{CPI}_{i1873}).⁸ 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 compensation variable is found in Appendix (A.3).

⁸Average increase in prices is the average CPI of USA, UK, France, Sweden, Denmark, Spain, and the Netherlands.

Summary statistics are found in Table (1.2) and data sources are in Appendix (A.2) 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.

Table 1.2: Summary Statistics

variable	mean	SD	N	min	max
ln gdp pc (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
ln slavepct (1830)	-0.518	0.527	28	-2.207	-0.123
ln resource	5.153	2.173	20	2.026	9.315
distance	0.301	0.394	28	0	1.242
institutions index	0	1.934	25	-4.331	2.158

Notes: Ln gdp pc (2019) 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 (1.1). Independent indicates if a territory is independent today. Ln slave pct gives the slave percentage of the population in roughly 1830. Ln Resource average per capita value of exports of metals, oil, and gold. Distance is the instrument and is the minimum distance to a slave market in 1000 kilometers. Institutions index is a PCA comprised of the average of rule-of-law, control of corruption, government effectiveness, and regulatory quality from 1996-2019.

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. *Slave pct*, is the percentage of slaves in the population for 1830.

Resource is a variable that captures the presence of valuable natural resources within a territory. It is the per capita value 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). Natural resources are an important export product for the region. Bauxite is extracted and exported in Jamaica, oil in Trinidad and St. Vincent, and gold in the Guyanas (Guyana, French Guiana, and Suriname). *Distance*, is the distance to closest slave market in 1000 kilometers. I further discuss this variable in Section (1.5). *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.

1.4 OLS Estimation

Figure (1.2) 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 (1.3) reports OLS regressions of log per capita GDP on the amount of compensation. The regressions are for the equation:

$$\ln gdp pc_{i2019} = \beta_0 + \beta_1 \ln comp_{i1873} + \mathbf{C}'_i \delta + \mathbf{X}'_i \gamma + \epsilon_i \quad (1.2)$$

$gdp pc_{i2019}$ is GDP per capita in country i for 2019, $comp_{i1873}$ is the compensation measure from Equation (1.1), and \mathbf{C}'_i is colonizer fixed effects. \mathbf{X}'_i is a vector of covariates that include an independence indicator, slave percentage of the population in 1830, and a measure for the value of resources. 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.⁹ 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

⁹Puerto 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.

column, I regress 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.

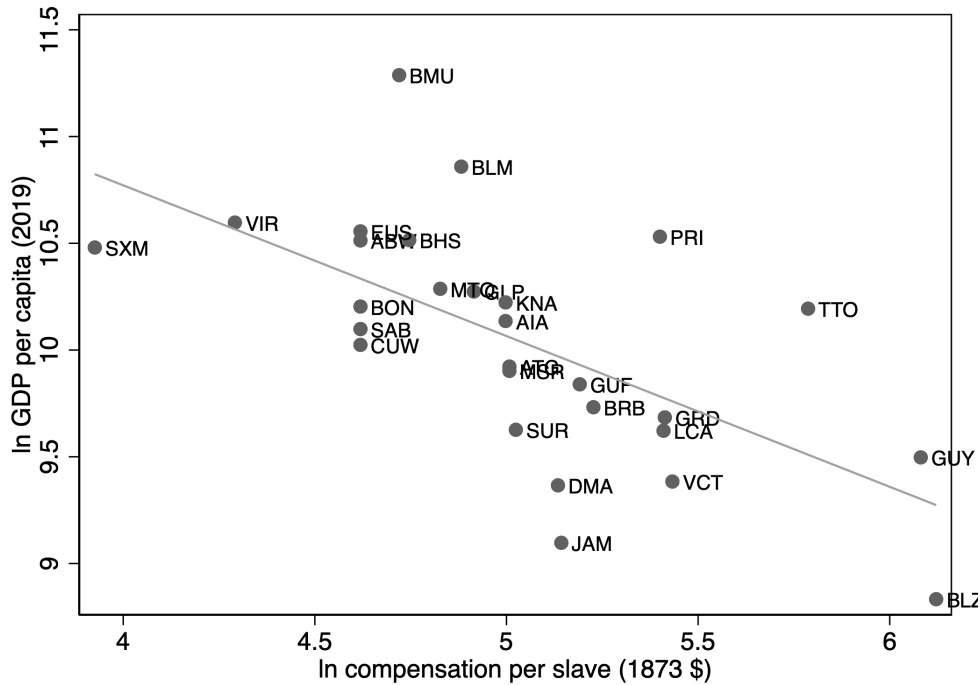


Figure 1.2: Relationship between Incomes in 2019 and Compensation per slave (1873 \$)

Notes: The figure shows the relationship between the natural log of current GDP per capita in 2019 and the natural log of compensation per slave in 1873 USD for the 28 territories in this study. The abbreviations are the three digit territory codes and can be found in Table (1.1) in Appendix (A.9)

Column 1 shows there is a strong negative relationship between the compensation measure and current incomes. Figure (1.2) 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, respectively. 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 interpret the estimates as causal.

Table 1.3: OLS, Relationship between Compensation and Income

	Dependent variable is ln gdp pc in 2019					
	(1)	(2)	(3)	(4)	(5)	(6)
ln comp (1873 \$)	-0.706*** (0.171)		-0.734*** (0.215)	-0.540** (0.226)	-0.688*** (0.220)	-0.571** (0.251)
Dummy for comp in 2nd quantile		-0.522** (0.210)				
Dummy for comp in 3rd quantile		-0.754*** (0.210)				
French colonizer			0.248 (0.250)	-0.0788 (0.289)	-0.0153 (0.269)	0.708 (0.487)
Dutch colonizer			-0.129 (0.247)	-0.313 (0.251)	-0.448* (0.241)	-0.281 (0.326)
USA colonizer			0.418 (0.335)	0.112 (0.352)	-0.178 (0.353)	- -
independent				-0.488* (0.248)	-0.310 (0.244)	-0.280 (0.277)
ln slave pct (1830)					-0.374** (0.174)	-0.0910 (0.246)
ln resource						0.0610 (0.0540)
Observations	28	28	28	28	28	20
R-squared	0.396	0.355	0.480	0.558	0.637	0.650

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. OLS estimates of Equation (1.2) 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 (1.1). 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. Ln Resource average per capita value of exports of metals, oil, and gold.

In Columns 3-6, I add colonizer fixed effects and various controls. [La Porta et. al. \(1999\)](#) argues 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. The estimates show some effect on current incomes. The final specification is found in Column 6, where I add the value of natural resources along with the other controls, as is done in [Nunn \(2008\)](#). In theory, resources like valuable metals, oils, and gold will have a positive impact on development as territories could take advantage of their own resources through trade and consumption. This variable is only available for 20 territories, but it is insignificant while the compensation measure maintains its significance.

In all specifications, compensation is significantly negatively associated with current GDP per capita's. Although compensation for abolition happened almost 200 years prior to the measure of incomes, there might be reasons to not interpret 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, p. 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 availability 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.

1.5 Instrumental Variables

The instrument, *distance*, is the distance in 1000 kilometers to the nearest exporting slave markets. Distance played a key role in the price paid for new slaves as the travel acted as an additional input cost ([Bolland, 1981](#), p. 602). Therefore, according to the formula for compensation, the

areas furthest from markets would receive more compensation. I use the Intra-America Slave trade database ([Slave Voyages, 2024](#)) to find territories that were exporting slaves between the slave trade ban (1807) and full abolition (1873).¹⁰ The data is not perfect as not all territories are included and many of these trades were done illegally, so there might not be evidence of them. However, it does provide enough information which we can use to check with other evidence of the Caribbean slave trade. The first-stage IV estimation is specified using Equation (1.3). *Distance* might not be the only determinant of compensation amounts, but it is proper instrument because it is a source of exogenous variation. The predicted values of Equation (1.3) are then used for the second-stage estimation with Equation (1.2).

$$\ln comp_{i1873} = \alpha_0 + \alpha_1 distance_i + \mathbf{C}'_i \eta + \mathbf{X}'_i \phi + \theta_i \quad (1.3)$$

Table (1.4) shows the export cut off point that I use to determine slave markets. There are a total of 4,854 slaves traded between 1807 and 1873 from eighteen territories documented in the Intra-American Slave Trade Database. 76% of this trade was facilitated by one of the six territories. The next highest exporting market was Cuba (299), however it is not a minimum distance to any of the territories in this study, so it is not included. Guadeloupe, which has the fewest exports of the slave markets, has over double the amount of exports than Curacao. [Williams \(1942\)](#) states that slaves were traded from areas which had an oversupply of slaves to growing islands. The territories mentioned above had an oversupply of slaves, either from a stagnating plantation economy or high population growth. However, Bermuda is a territory not in the Intra-American Slave Trade Database that also fit this characterization. Bermuda banned the importation of new slaves in 1676 ([Jarvis, 2002](#), p. 590), so they were not purchasing new slaves preceding abolition. Also, given its distance to the rest of the Caribbean islands, treating it as a slave importing island would bias the results. Therefore, I include it as a slave market.

¹⁰These are the dates of the earliest slave trade ban by the British and the latest abolition in this study in Puerto Rico.

Table 1.4: Exports Cut-off

Territory	Slave exports	Share
St. Barthelemy	1,122	23%
Danish West Indies	668	14%
Jamaica	605	12%
Barbados	555	11%
The Bahamas	384	8%
Guadeloupe	363	7%
Cuba	299	6%
Place Unspecified	218	5%
Curacao	150	3%
...	490	10%
Total (18)	4854	

Notes: The export cut-off line is indicated by the black line through the center of the table. Data is from the Intra-America Slave trade database ([Slave Voyages, 2024](#)). Cuba is not counted as a slave market because it is not a minimum distance to any of the territories. The three dots below Curacao is the summation of slave exports from the remaining nine territories found in the database.

The seven slave markets are: New Providence in The Bahamas, Barbados, Bermuda, St. Thomas in the Danish West Indies, Guadeloupe, Kingston in Jamaica, and St. Barthelemy.¹¹ A detailed explanation of the construction of the instrument is in Appendix (A.4). Exporting slave markets were chosen due to a variety of factors such as a large slave population, stagnant plantation system, or revenues from selling slaves and not because of its proximity to other territories nor vice-a-versa. In other words, slave markets were not decided because plantations were growing in nearby territories nor were heavy slave importing territories picked because they were close to these markets. Therefore, the distance is quasi-random and not related to the level of development nor the reliance on slavery. I treat the seven slave markets as their own importers and this raises a concern because the choice of a slave market might be related to its own development. However, slave markets were chosen for a variety of factors and it is unclear what its relationship to development was. Nonetheless, I address this concern in Section (1.7).

The IV results are shown in Table (1.5).¹² Each column is a regression on the same sample, but with more controls added. Panel B and C in Table (1.5) test the validity of the instrument.

¹¹I use cities when this information is available from the Trans-American Slave Trade Database. When the city is not included I use the center of each territory.

¹²Results from the Wu-Hausman test are insignificant, which might suggest the IV approach is unnecessary. However, given the potential for biases mentioned above, I think the IV is more appropriate than OLS.

The first-stage estimates are shown in the former and confirm the relevance criteria for minimum distance to slave markets as an instrument for compensation. With exception of the first column, all specifications show that *distance* and compensation are significantly related to each other at the 1% level. Also, the *F-stat* in these specifications are all over 10, which suggests the instrument is strong (Stock and Yogo, 2005). Panel C confirms that the instrument is exogenous to income. The estimates shown are from adding *distance* as an independent variable to Equation (1.2). In each regression, *distance* has no association with income levels.¹³

Panel A of Table (1.5) shows the second stage results. $\ln comp_{1873}$ is significant in all specifications. In comparison to the OLS results, the IV estimation yields larger coefficients. Roughly, a 1% increase in compensation leads to a 1% decrease in 2019 income levels. Also, in Column 4 I find negative significance for $\ln slave pct_{1830}$. This finding is in line with arguments advanced by Nunn (2007) and Engerman and Sokoloff (2002). Column 5 has fewer observations because it includes the variable for valuable resources, which is again insignificant.

1.6 Mechanisms

In this section, I consider potential channels by which compensation harms current economic conditions. The mechanisms considered are the continuation of the plantation, an environment of conflict, and the brutal treatment of slaves. All three mechanisms harm institutional development.

1.6.1 The Plantation Continues

Historians and colonial documents put forth that the purpose of compensation was to help the plantation survive. Compensation helped plantation owners pay wages, import equipment and contract laborers, and pay of their debts. In doing so, freed slaves were stuck in the same place as they were during slavery but now could reject the plantation. In the end, for most colonies sugar production declined dramatically despite the attempts to make it more productive. The issue was they expected the slaves to be ‘grateful’ for their freedom and they assumed they would submit while

¹³Nunn (2008) uses distance to importing slave markets as an instrument for Africa, and also finds no relation with income levels.

Table 1.5: IV, Relationship between Compensation and Income

	(1)	(2)	(3)	(4)	(5)
<i>Panel A: 2nd Stage, Dependent variable is ln gdp pc in 2019</i>					
In comp (1873 \$)	-1.258** (0.566)	-0.973*** (0.291)	-0.846*** (0.318)	-1.115*** (0.334)	-0.736*** (0.249)
independent			-0.341 (0.256)	-0.0744 (0.271)	-0.205 (0.236)
ln slave pct (1830)				-0.480*** (0.176)	-0.114 (0.202)
ln resource					0.0621 (0.0443)
Colonizer fixed effects		X	X	X	X
R-squared	0.154	0.452	0.521	0.572	0.638
<i>Panel B: 1st Stage, Dependent variable is ln comp (1873 \$)</i>					
distance	0.427* (0.214)	0.708*** (0.143)	0.632*** (0.146)	0.594*** (0.151)	1.039*** (0.181)
independent			0.290* (0.166)	0.331* (0.176)	-0.0305 (0.182)
ln slave pct (1830)				-0.106 (0.134)	0.403** (0.183)
ln resource					0.0473 (0.0346)
Colonizer fixed effects		X	X	X	X
Adj. R-squared	0.085	0.621	0.652	0.646	0.794
<i>F-stat</i>	3.504	20.755	16.539	13.162	27.812
<i>Panel C: Exogeneity of Instrument, Dependent variable is ln gdp pc in 2019</i>					
distance	-0.267 (0.223)	-0.322 (0.304)	-0.338 (0.285)	-0.413 (0.259)	-0.540 (0.561)
Observations	28	28	28	28	20

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are in parentheses. IV estimates of Equation (1.2) are reported in Panel A. First stage estimates from Equation (1.3) 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 (1.1). 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. ln Resource average per capita value of exports of metals, oil, and gold. The instrument used is the minimum distance to slave markets in 1000 kilometers. In Panel C, I add distance to slave markets into Equation (1.2) and estimate using OLS. For conciseness, I only show the estimates for minimum distance.

still experiencing callous treatment. To counteract, plantation owners relied on the importation of indentured servants from India and China.

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](#), p. 35)

Next, I analyze institutions as a potential channel in which compensation affects current incomes. Compensation hindered institutional development for two reasons. First, 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, which will be discussed in Section (1.6.3). Therefore, 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 will be discussed in Section (1.6.2).

Figure (1.3) 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 institutional variables as described in Section (1.3). 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. \(2001\)](#) argue that institutions have an important causal effect on incomes.

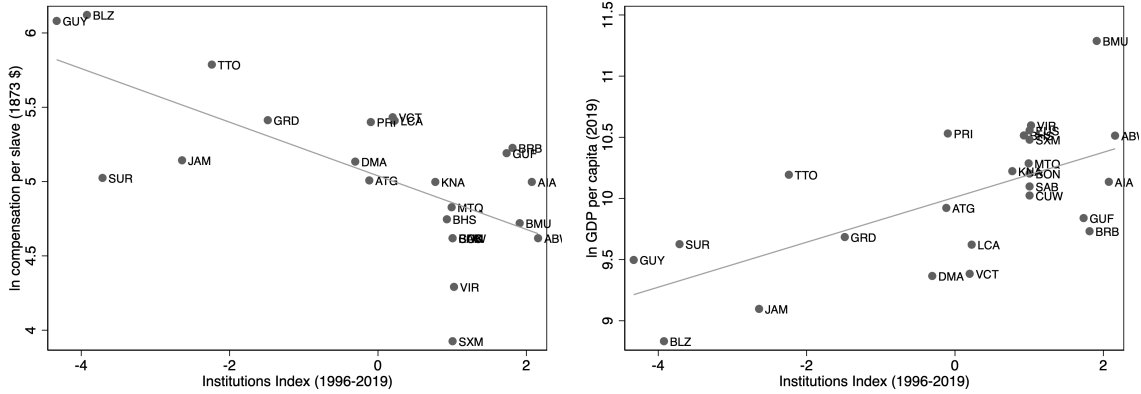


Figure 1.3: Institutions Relationship with Compensation (left) and Income (right)

Notes: The left panel of the figure shows the relationship between institutions index and the natural log of compensation per slave in 1873 USD. The right panel of the figure shows the relationship between institutions index and the natural log of current GDP per capita in 2019. Only 25 observations are available for the institutions index. Institutions index is a PCA comprised of the average of rule-of-law, control of corruption, government effectiveness, and regulatory quality from 1996-2019. The abbreviations are the three digit territory codes and can be found in Table (1.1) in Appendix (A.9).

Next, I observe the relationship between compensation, institutions, and current incomes in Table (1.6). Panel A are basic OLS regressions of institutions on compensation. In all specifications, $\ln comp_{1873}$ has a significantly 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. The difference between being in the first and third quantile of compensation is 2.10 units of the institutions index. 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.

In Panel B of Table (1.6), 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

Table 1.6: Relationship between Compensation and Institutions

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: OLS, Dependent variable is average institutions index from 1996-2019</i>						
ln comp (1873 \$)	-2.540*** (0.576)		-3.240*** (0.720)	-2.437*** (0.690)	-2.826*** (0.723)	-3.023*** (0.719)
Dummy for comp in 2nd quantile		-1.859** (0.890)				
Dummy for comp in 3rd quantile		-2.105** (0.792)				
independent				-2.320** (0.844)	-1.747* (0.912)	-2.261** (0.946)
ln slave pct (1830)					-0.889 (0.617)	-1.139 (0.717)
ln resource						-0.0854 (0.154)
Colonizer fixed effects			X	X	X	X
R-squared	0.458	0.271	0.556	0.682	0.715	0.801
Observations	25	25	25	25	25	18
<i>Panel B: Mediation Analysis, Dependent variable is ln gdp pc in 2019</i>						
	Indirect	Direct	Total			
comp (1873 \$) quantile= 3 vs 1	-0.260** (0.129)	-0.542** (0.225)	-0.802*** (0.243)			
colonizer fixed effects	X	X	X			

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are in parentheses. Panel A reports OLS estimates using Equation (1.2), 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 (1.1). 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. Ln Resource average per capita value of exports of metals, oil, and gold. 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.

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 (1.3) and (1.5).

1.6.2 An Environment of Conflict

Abolition changed the social structure of the Caribbean by transitioning slave labor into free labor. However, the economic structure of the plantation and the same two classes of people,

ex-slaves and ex-slave owners, were maintained. They were clearly separated by race but one group had the majority of the population and no power, and the other group was the minority with concentrated power and wealth. The interests of the two groups did not align as the ex-slaves did what they could to reject the plantation while the ex-slave owners used their power to force the plantation as documented in Section (1.2). The incompatibility created an environment of conflict that continues to shape the West Indian territories. Compensation, in continuing the institution of the plantation to persist, fostered this conflicting social structure. [Acemoglu et. al. \(2005\)](#) declares that those with political power establish economic institutions that serves their own interests, even if it is not maximizing aggregate growth. Slave-owners clearly held power in the Caribbean territories and compensation helped maintain and enhance this power.

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,¹⁴ who remain within the region. The genesis of their power and control is directly linked with the transition to free labor and they benefited 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

¹⁴Jewish, Syrian, and European ancestry

common in the Caribbean. In response to the civil unrest, the white and mixed elites gave up their self-governing powers and officially established themselves as crown colonies of Britain.¹⁵

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 27 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 corporate chairmen come from one of these families, and that there is not one top 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-competitive 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 multi-national corporations following abolition (Constant, 1998; Kováts-Beaudoux, 2002; Vogt, 2005). Present-day Caribbean continues to be haunted by its past.

¹⁵The only exception is Barbados. As we argue, the conflict between ex-slaves and owners were not as large in this territory.

1.6.3 Brutal Areas Favored

Compensation favored areas where slaves were treated most brutally, and it can be proved with colonial data. Specifically, birth rates minus death rates per 100 slaves, which I call population growth.¹⁶

Areas with lower population growth needed to replace their declining population through purchasing slaves. 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, p. 29). OLS regressions estimate the relationship between compensation and population growth in Table (1.7). 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.

1.7 Robustness

I test the relationship between compensation and current incomes using alternative specifications of the base IV estimation in Table (1.8). Columns 1-5 use the same regression as Column 4 in Table (1.5), 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

¹⁶Typically called the natural increase of the population, but there is nothing natural about slavery. I include Belize and Bermuda although the data is not available. For the former I use a conservative estimate estimate of $-.2\%$ based on the slave population and import data, also slave labor in Belize was subject to a cruel mahogany production. Slaves were known to be treated well in Bermuda so I use 1.2% as a conservative estimate. This estimate is comparable to the Bahamas. (Bellhorn, 1992, p. 12).

Table 1.7: OLS, Relationship between Compensation and Population Growth

	(1)	(2)	(3)	(4)	(5)
	Dependent variable is ln comp (1873 \$)				
slave pop growth	-0.309*** (0.0586)	-0.270*** (0.0767)	-0.230** (0.0988)	-0.335*** (0.103)	-0.412*** (0.118)
independent			0.152 (0.229)	0.122 (0.210)	-0.124 (0.260)
ln slave pct (1830)				-0.424** (0.196)	-0.540** (0.225)
ln resource					0.0209 (0.0432)
Colonizer fixed effects		X	X	X	X
Observations	23	23	23	23	19
R-squared	0.570	0.651	0.659	0.733	0.769

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. OLS estimates of Equation (1.2) 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 preceding 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 (1.1). 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. ln Resource average per capita value of exports of metals, oil, and gold.

incomes caused by compensation is getting worse over time. The coefficients in 2019, 2000, and 1990 are -1.115, -0.968, and -0.917, respectively.¹⁷

Unfortunately, income data on these Caribbean territories are sparse prior to 1990. It would be interesting to see how compensation affected the region during the middle of the 20th century. However, accounts on these economies prior to widespread independence movements in the late 1950s and early 1960s indicate that the territories were poor. It was not until civilian air travel became affordable and enhanced global financialization granted opportunities for mass tourism and tax havens that we see a divergence of incomes. Based on these accounts, I suspect that the effect of compensation was latent until the mid to late 20th century. This does not mean that compensation does not have a causal effect. Rather, as argued by the Plantation Economy School (Beckford, 1999; Best and Polanyi-Levitt, 2009), the region lacks internal development. Economic decision making is done by individuals outside these territories. Hence, international companies dominate the mass tourist and tax haven industries. The argument is that low compensation territories,

¹⁷However, with OLS regressions the coefficients are about the same.

Table 1.8: IV, Compensation and Income with Alternative Specifications

	(1) 1990	(2) 2000	(3) area > 50 km ²	(4) No Mkts	(5) cook's d < 4/N	(6) Alt. control	(7) Alt. control
<i>Panel A: 2nd Stage, Dependent variable is ln gdp pc</i>							
ln comp (1873 \$)	-0.917*** (0.275)	-0.968*** (0.266)	-0.933*** (0.299)	-0.963*** (0.314)	-1.089*** (0.323)	-0.949*** (0.328)	-1.654*** (0.620)
independent	-0.570** (0.268)	-0.306 (0.233)	-0.134 (0.261)	0.021 (0.255)	0.0668 (0.259)		
ln slave pct (1830)	-0.625** (0.251)	-0.698*** (0.216)	-0.467** (0.196)	-0.170 (0.196)	-0.422** (0.176)		
self-governance						-0.100 (0.299)	0.204 (0.409)
hurricane belt							-0.496 (0.306)
R-squared	0.768	0.764	0.608	0.543	0.529	0.461	0.286
<i>Panel B: 1st Stage, Dependent variable is ln comp (1873 \$)</i>							
distance	0.594*** (0.164)	0.594*** (0.164)	0.747*** (0.178)	0.690*** (0.182)	0.587*** (0.165)	0.634*** (0.139)	0.535** (0.195)
independent	0.331* (0.176)	0.331* (0.176)	0.366** (0.167)	0.221 (0.181)	0.262 (0.191)		
ln slave pct (1830)	-0.106 (0.134)	-0.106 (0.134)	-0.173 (0.143)	0.136 (0.181)	-0.131 (0.138)		
self-governance						0.440** (0.158)	0.439** (0.159)
hurricane belt							-0.110 (0.150)
Adj R-squared	0.798	0.690	0.648	0.773	0.651	0.707	0.701
F-stat	44.691	24.874	17.520	14.398	12.727	20.746	7.522
colonizer fixed effects	X	X	X	X	X	X	X
Observations	18	22	24	21	27	28	28

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. IV estimates using different specifications of Equation (1.2) 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 km². In Column 4 I drop all observations that are considered slave markets, given the potential correlation with slave market choice to development. Column 5, drops all observations with a cook's distance score greater than 4/N. The only territory dropped is Bermuda. Columns 6 and 7 use a different set of controls: self-governance indicates if a country has their own elected government today, and the hurricane belt. Hurricane belt is a hypothetical area depicting a high potential for direct hurricane hits, shown in Figure (A.1). 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 (1.1). 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. The instrument used is the minimum distance to slave markets in 1000 km.

because of relatively better institutions, were chosen as centers for tax breaks and tourist which have enhanced their contemporary incomes. It is not the case that rich islands of the regions are intrinsically more beautiful or more suitable for finance, rather it is their institutions which have created these opportunities for them.

Columns 3-5 eliminate certain observations which might cause some bias. Column 3 limits the sample to areas of at least 50 km squared, to avoid potential biases from tiny territories. Since I count each slave market as its own importer in the base specification, I address the potential concern of slave markets being related to their own development in Column 4. In Column 4, I drop all observations which are slave markets and the results remain negatively significant. Also, due to the limited sample size of this study, I check for small-sample robustness in Column 5. This is done by dropping all observations with a Cooks distance score greater than $4/N$.¹⁸ The coefficient of compensation is significant in all columns. Also, the IV results in Table (1.8) are significant under OLS, too.

A new set of controls are introduced in columns 6 and 7. *Self – governance* indicates if a country has independent political institutions and follows the country list from UN (2024c). *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. Appendix (A.1) shows this hypothetical area. Basically, St. Lucia and all territories south of it are outside the hurricane belt. In both specifications of the additional controls, compensation still significantly affects current incomes. Also, I check the results using different measurements of compensation in Appendix (A.5), for a different instrument strategy with slave density as the instrument in Appendix (A.6), and with including Haiti to the analysis in Appendix (A.7). In each case, negative significance is maintained.

¹⁸N refers to total observations, and is 28 in this case. This is the suggested cutoff level (Bollen and Jackman, 1990). Bermuda is the only territory which fails, so it is dropped.

1.8 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 sub-human. Therefore, upon abolition these territories had less compatibility 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 so the plantation could survive. Also, the wealthiest families in the Caribbean today have their origins of fortune in the transition from slavery and benefited from the compensation process (Numa, 2018; Reid, 1977, 1980). These families were beneficiaries 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 they were not reliant on the plantation, 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. Although plantation production was not suitable for long-run growth, the compatibility allowed better 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, the colonial reports during the compensation were well kept and verified by government entities. Another point of potential concern is that I have decompressed history. There are no results for the early and mid 20th century. To my knowledge, there is no data on the economic performance of most of these territories in the years between slavery and today. I attempted to provide estimates for different years (1990 and 2000), but there is still a huge gap in the data.

A key takeaway from this article is that the transition out of slavery has a persistent effect. I use distance to slave markets as an instrument for compensation to deliver causal estimations. Distance affected the input price of selling slaves in home markets. According to the formula for compensation, this higher price meant more compensation. These results carry critical implications for modern policy debates on reparations, institutional reform, and development strategies. Targeted reparations programs that invest in education, infrastructure, and local entrepreneurship could help mitigate the inequalities rooted in colonial policies. For example, providing financial support for historically marginalized communities could address disparities in access to resources and opportunities. Additionally, policymakers should incorporate historical contexts into contemporary institutional reforms to ensure that economic policies address systemic issues, rather than just their symptoms.

By bridging historical analysis with present-day policy challenges, this study contributes to a deeper understanding of the enduring impact of slavery and colonialism on economic development. Addressing these legacies is essential for fostering inclusive growth and creating equitable opportunities for all, particularly in regions like the Caribbean, where the echoes of the past still resonate strongly today. 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.

Chapter 2

Arthur Bloomfield and the West Indian Federation

2.1 Introduction

¹⁹Arthur Bloomfield (1914–1998) arrived in the British West Indies in December of 1960, where he stayed for about three weeks on two trips to Trinidad and Jamaica. Though a short stay, this was a definitive period for the countries of the West Indies. Jamaica was on the eve of holding a referendum, where they would vote on whether to secede or remain in the West Indian Federation. The West Indian Federation was a loose political organization of ten British colonies in the Caribbean: Jamaica, Trinidad, and the “eight.”²⁰ The goal was to achieve independence from the Motherland and enhance the region’s development. Constant conflict from the area’s most prominent politicians doomed the Federation, lasting only four years, from 1958 to 1962. These were the Premier of Jamaica, Norman Manley, the Premier of Trinidad, well-known economic historian Eric Williams, and the Prime Minister of the Federation, Sir Grantley Adams.

Sir Arthur Lewis, a St. Lucian national, Economics Nobel Prize Laureate in 1979 for his pioneering work in economic development, and an activist for the Federation, invited Bloomfield on recommendation from Robert Triffin.²¹ Lewis and the rest of the West Indies needed an expert on central banking and Bloomfield’s job was to give advice for the formation of multiple central banks within the West Indian Federation. Lewis outlines the main issue in his invitation letter: “One of the problems of our newly created Federation is the coordination of central banking. Jamaica is establishing a central bank, and so is Trinidad, and so also is the Federal Government;

¹⁹Co-authored with Guy Numa

²⁰Antigua, Barbados, Dominica, Grenada, Montserrat, St. Kitts-Nevis-Anguilla, St. Lucia, and St. Vincent.

²¹Triffin stated he was busy with “Congolese negotiations, and more recently by [his] involvement in our own gold and dollar problems”, but Bloomfield was his first choice. Robert Triffin to Arthur Bloomfield, 9 December 1960, box 1 (incoming correspondence), folder 1960, Arthur Bloomfield Papers, David M. Rubenstein Rare Book & Manuscript Library, Duke University.

so we are threatened with three central banks in this small area which some people believe does not even need one central bank."²²

The major conflict of the West Indian Federation was the competing view on political power between the two biggest territories: Jamaica and Trinidad & Tobago. Jamaica wanted a weak federation with most of the power maintained in the individual units. Trinidad, on the other hand, favored a centralized federation where resources would be redistributed from the stronger to the weaker territories. Rather than assisting to bridge the gap between the territories, Prime Minister Adams tended to add fuel to the flames by upsetting Williams and Manley. The vision for central banking arrangements followed the same dichotomy as the view for political power. Jamaica was for autonomous regional central banks, while Trinidad wanted the regional banks to be operating arms of the West Indian Federation Central Bank. At the time of Bloomfield's arrival, the Jamaican outlook of political and central banking arrangements had 'won', and the constitution was being finalized.

Bloomfield's advice for the region is found in *Central Banking Arrangements for the West Indian Federation* (1961). An analysis of his contributions to the West Indies unveils the continuity and flexibility of Bloomfield's methods throughout his career. As a money-doctor since the late 1940s, Bloomfield thought central banks in underdeveloped countries should be equipped with wide-ranging tools, but they were restrained in terms of policy making by their historical and institutional conditions. In this respect, Bloomfield approached the West Indies in the same way as his previous missions and studies of central banking. However, every mission was unique which required distinctive considerations. This approach is a significant break from the previous generation of money doctors in the Kemmerer era,²³ who preached the same message for all countries.

To understand Bloomfield's *modus operandi* and his significance, we begin with an outline of his biography and experiences while emphasizing his role in post-WWII money-doctoring. Given

²²Arthur Lewis to Arthur Bloomfield, 29 November 1960, box 1 (incoming correspondence), folder 1960, Arthur Bloomfield Papers, David M. Rubenstein Rare Book & Manuscript Library, Duke University.

²³Kemmerer is most known for his involvement in Latin America during the inter-war years, but his first mission was to the Philippines in 1904 ([Gomez-Betancourt, 2022](#)).

his attentiveness to specific conditions, we describe the environment of The West Indian Federation and the banking system of the area at the time of his visit in the following section. In Section (2.5), we analyze Bloomfield's report for the Federation. The final section concludes the study. Our objective is to provide an example of the continuity and flexibility of US monetary foreign policy in the post-war period and the role of economists under this framework. The West Indies in the early 1960s were small island colonies seeking to unify and establish independence. The distinctiveness of this environment is a perfect setting to analyze the stated objective. In addition to published sources, the study draws upon a comprehensive review of the Bloomfield's archives held at The David M. Rubenstein Rare Book and Manuscript Library at Duke University and the Arthur Lewis's archives located at Princeton University's Department of Special Collections Library.

2.2 Arthur Bloomfield's Background

2.2.1 Context and Influences

After graduating from McGill University in 1936, Bloomfield pursued a PhD in Economics at the University of Chicago, where he was exposed to various personalities and perspectives ([Asso and Fiorito, 2013](#)). At Chicago, he was a student of Frank Knight and Jacob Viner. Another influence outside the university was Robert Triffin ([Alacevich and Asso, 2009](#), p. 250-252). Among these three economists, Viner was "undoubtedly the dominant intellectual influence in [his] life" ([Bloomfield, 1994](#), p. 5). It therefore is reasonable to hypothesize that Viner's views on central banking and monetary matters greatly influenced Bloomfield. They were both Canadian-born economists trained at McGill University and the University of Chicago, and had interests in the history of economic thought and international monetary economics. Further, like Bloomfield, Viner was "an economic adviser actively engaged in public service" particularly in the international monetary field ([Nerozzi, 2011](#), p. 56).

Viner supervised Bloomfield's doctoral dissertation on capital movements, which blended international economics and the history of economic thought. Bloomfield ([1994](#), p. 6) adds that it was from "Viner that I learned the importance of knowing the real world and real-world problems

before attempting to apply abstract economic theory to reality, especially when offering policy recommendations." This statement offers the key to understanding Bloomfield's role as an economic advisor to the West Indies and the type of recommendations he offered, one that is distinct from the top-down model of money-doctoring practiced by Edwin Kemmerer ([Alacevich and Asso, 2009](#)). It also helps to understand Bloomfield's pragmatic stance when he posits that "central banking in [developing] countries should not necessarily be evaluated in terms of the standards and criteria applied in the more developed ones" ([Bloomfield, 1957](#), p. 197).

Like Viner, Bloomfield favored a discretionary approach of monetary policy ([Bloomfield, 1992](#), p. 2076); ([Alacevich and Asso, 2009](#), p. 250). [Viner \(1962, p. 252-259\)](#) firmly held that monetary authorities should have the latitude to use a wide range of discretionary power and flexibility to conduct their policies, thus rejecting Milton Friedman's rule regarding a constant rate of increase in the money stock ([Irwin, 2016](#)). [Viner \(1962, p. 245\)](#) argued that the rule "can be an instrument of tyranny," predicting future price levels was impossible, and that central banking should promote employment and growth along with price stability. Therefore, central banking should be done in a discretionary manner.

Under the Kemmerer-type central banking, all countries received the same suggestions and policies. "The central recommendations of the Kemmerer missions remained remarkably constant over time" ([Eichengreen, 1994](#), p. 113). It was thought that applying the gold standard would automatically solve monetary issues ([Gomez-Betancourt, 2022](#), p. 484). This automatism is what Bloomfield labeled the 'myth' of the gold standard. Kemmerer and his followers implemented a strict code for underdeveloped countries to stabilize prices and exchange rates and raise international investment. The program promoted external stability through automatic monetary adjustments, however the passive monetary policy left countries vulnerable to external shocks which reinforced inflationary tendencies ([Helleiner, 2003](#), p. 251). [Triffin \(1946, p. 64\)](#) noted, "The main result of 'orthodox' gold standard policies, under such circumstances, was to propagate to the world at large any cyclical disturbance arising in major industrialised nations."

From 1941 to 1958, Bloomfield joined the Federal Reserve Bank of New York as a research economist and eventually became an officer. After, he joined the faculty of the University of Pennsylvania where he remained until his retirement in 1985. During his time with the Federal Reserve, he began visiting several developing countries to advise on central-banking related issues. Bloomfield's foreign assignments and visits "helped to improve [his] ability to adjust economic and monetary theories to the facts of differing real-world backgrounds and situations; and they increased [his] knowledge of, and interest in, the economics of growth in the special framework of developing countries" (Bloomfield, 1994, p. 17).

The Keynesian economics revolution sparked a new approach to central banking which broke with Kemmerer's principles. It was pioneered by Robert Triffin in his missions to Paraguay in 1943-1945 who oversaw Latin America in the International Section of the Federal Reserve in Washington (Maes and Pasotti, 2021, p. 43-44). Bloomfield and others soon followed,²⁴ and they provided central banks the power to foster economic development through influencing financial and foreign exchange markets (Helleiner, 2003, p. 250-257). Well-designed central banking should enhance internal stability, "insulate the national economy from international disruptions" (Helleiner, 2003, p. 252), and be flexible with a wide range of powers. The shift in the international order from the gold standard to Bretton Woods set the seeds for the new style of central banking by granting more power for discretionary central banking. It also corresponded with the cold war and increased US involvement in the international sphere, which meant extending its relations with developing and developed countries alike with strategic missions of American foreign financial advisors (Helleiner, 2003).

2.2.2 Bloomfield's Vision for Central Banks

In *Some Problems of Central Banking in Underdeveloped Countries* (1957), Bloomfield laid out his vision for central banking in developed countries which was consistent with Triffin's agenda. For Bloomfield (1957, p. 195), "the basic objectives of monetary policy, and indeed

²⁴Bray Hammond, John Exter, Henry Wallich, David Grove, John Jensen, and John Williams (Urquidi, 1991).

of fiscal policy, do not differ greatly in underdeveloped countries from those in the more developed ones, despite the widely differing economic and social frameworks. . . . But there is likely to be a substantial difference in emphasis on these goals in the two sets of countries. In developed countries, the avoidance of inflation and deflation is usually the primary objective. In underdeveloped countries, on the other hand, the promotion of economic growth tends to overshadow all other goals of national economic policy." Although he was critical of monetary policies that place economic growth over financial stability, Bloomfield thought central banks could still assist in development through influencing the direction of resources. This could be done through various tools such as loan ceilings, exchange controls, and local asset requirements.

According to Bloomfield, there are three major distinctions in the conditions of underdeveloped countries relevant to central banking. First, they are constrained by a primitive financial system. "Money does not play the same pervasive role that it does in developed countries" (Bloomfield, 1957, p. 192). In underdeveloped countries, a good portion of the economy is in the informal sector, which may be dominated by barter transactions. It is necessary to increase the number of commercial bank branches in the informal sectors and to establish a market for government and financial securities, which will set the groundwork for effective monetary policy and the attraction of investments.

Second, underdeveloped countries have a smaller domestic sector and a concentration of exports in a few industries, which makes them more susceptible to externally generated fluctuations. The passive monetary policies in the Kemmerer era made this situation worse. In extreme cases, like the West Indies, the growth path of these economies is almost completely determined by the movement in demand for their exports. "Such money supply changes are not easily subject to the control of the central bank" (Bloomfield, 1957, p. 194). For example, a contraction in export demand will create a balance of payments deficit. Monetary policy consistent with expanding credit to commercial banks could help cushion the deficit and prevent more drastic contractions, but this will not reverse the external demand so the problem will still need to be solved. To counteract, Bloomfield proposed a combination of counter-cyclical monetary and fiscal policies. During

export booms, central banks should refrain from expanding credit, and the government should increase taxes and lower government expenditure. This will prevent incomes and imports from rising significantly and lead to a balance-of-payments surplus in exchange reserves. The authorities can build up a surplus during positive foreign demand shocks for use in adverse foreign demand shocks, thereby creating a smoother business cycle.

Lastly, central banks in underdeveloped countries tend to exacerbate financial instability by succumbing to development urges and expanding credit. [Bloomfield \(1957, p. 193\)](#) states that the lack of resources in these economies “contribute to strong political pressures upon the central bank to extend credit unduly.” However, he understood that central banks and monetary policy are not the only contributors to financial stability. Fiscal, wages, and other policies are equally important. Therefore, coordination between the central bank and the government is essential. However, it was necessary that central banks could use their own discretion in policy-making:

Although the government and the central bank must of necessity be in close and continuous consultation on a wide range of matters, effective monetary policy also requires that the central bank should exercise, and be encouraged by the government to exercise, a wide measure of freedom in policy-making, in operations, and in independently developing and expounding its own point of view on the basis of its objective appraisal of the situation at hand, freed from short-run political pressures which may often conflict with the long-run welfare of the economy. ([Bloomfield, 1956, p. 270](#))

Bloomfield modernized central banking in Indo-China and South Korea. His South Korean missions in the late 1940’s to early 1950’s primarily dealt with the problem of political interference in central bank policies, which drove credit expansions and inflationary tendencies in the economy ([Alacevich and Asso, 2009; Bloomfield and Jensen, 1951](#)). Amid the Korean War (1950-1951), Bloomfield “was put in military uniform and given the rank of assimilated colonel” ([Bloomfield, 1994, p. 11](#)). Bloomfield and his colleague, John P. Jensen, created the constitution for the Bank of Korea and equipped it with the functions of a modern central bank. The most important innovation of the new constitution was the monetary board, a representation of economic interests across the

country, who could enact policies under the Bank's constitutional rules. The board would create the necessary independence from political interference. The constitution from the Bloomfield mission has lasted till this day.

[Alacevich and Asso \(2009\)](#) observe that "the Bloomfield mission showed great sensitivity for the historical and institutional features of the South Korean banking and financial system" (p. 267). However, Bloomfield's mission was a significant departure from Triffin's in Latin America. For Bloomfield, central banking should work to "solving Korea's immediate problem, namely, that of bringing the present inflationary spiral under control" ([Bloomfield and Jensen, 1951](#), p. 161). Conversely, Triffin placed a higher priority in monetary policy geared toward development with much less concern for inflation ([Triffin, 1946](#); [Alacevich and Asso, 2009](#), p. 267). This difference was not a disagreement between the two economists, but rather the result of different institutional settings from the two regions and highlights the flexibility of the post-WWII money doctors. Bloomfield's mission to the West Indies is noteworthy because the environment of the region caused his approach to be back in line with Triffin's. That is, placing priority toward development.

As part of the Wilbur Foreign Policy Commission in the mid-1950s, Bloomfield's job was to oversee the creation of three separate central banks for the three Indo-China countries: Cambodia, Laos, and South Vietnam. Previously, these countries were linked by a currency board controlled by their colonizer, France. These missions were during a tense period between South and North Vietnam. By the time Bloomfield returned for his second trip in 1954, "the French had been defeated by the Viet-Minh" ([Bloomfield, 1994](#), p. 12). The central banks were limited during their establishment because of social disruptions from the Vietnam War and a lack of experienced personnel. Bloomfield advocated for flexible constitutions for each central bank to account for the significant changes occurring in the area during that time.

Overall, [Bloomfield \(1957, p. 204\)](#) thought it was necessary and desirable to move toward "a theory of central banking policy appropriate to the economically [underdeveloped] countries," a conviction he acquired based on his several years of experience visiting and advising foreign countries and institutions. There is some continuity in Bloomfield's diagnoses of central banking

across his work. Most importantly, the goal was the same: to equip central banks with a wide range of tools and to foster an environment conducive to long-term development while maintaining financial stability. In all his work, he saw protection against externally generated shocks, the need for a government securities market, and channeling resources for development as essential central bank functions. For the West Indies, he placed less emphasis on political interference, inflationary expansions, and increasing the role of money, not because he changed his mind but because West Indian authorities had a grasp on these issues. Rather, the West Indies' priority was promoting development and cooperation across the region.

2.3 The West Indian Federation

Trinidad and Jamaica were well beyond the “eight” in size, development, and population. Six out of the eight were reliant economically and politically on their colonizer.²⁵ At the Montego Bay Conference in 1947, Alexander Bustamante, the Premier of Jamaica, who played a pivotal role in the Federation's demise, charged the British government with dumping their responsibilities on Trinidad and Jamaica and setting up “The Federation of Paupers.”²⁶ Leaders agreed with Bustamante to delay the beginning of the Federation to 1958 to give the smaller islands time to develop on their own. Dudley Seers, the British economist, pointed out “the coming of federation will tend, if anything, to cause the gap between rich and poor islands to widen, rather than close” (Seers, 1957, p. 204).

The Federal Government had no real powers. The only source of revenue would be a mandatory levy from the islands,²⁷ the capital would be in Trinidad, and the constitution would remain unaltered for a grace period of five years. The primary politicians of the Federation were: Williams of Trinidad, Manley of Jamaica, and Federal Prime Minister Adams, three friends, members of the

²⁵For a detailed account of The West Indian Federation, see [Mordecai \(1968\)](#). See also [Archibald \(1962\)](#); [Killingray \(2000\)](#); [Padmore \(1999\)](#); [Wallace \(1961\)](#).

²⁶Proceedings of Montego Bay Conference, Colonial No. 218, HMSO 1948 pp. 20–27.

²⁷The levy was used to grow the University of West Indies: a campus opened in Trinidad in 1960, and the campus in Jamaica was improved. It was also used for the incomes and facilities of the Federal administration ([Mordecai, 1968](#), p. 78).

same party, graduates of Oxford University, and firm advocates of federating. It was apparent prior to 1956 that Jamaica and Trinidad had opposing approaches toward the Federation. However, [Mordecai \(1968, p. 158\)](#) claims, "This Federation was destroyed more by such failings among its leaders, than the issues that divided them."

For the West Indies, federating was the quickest way toward independence, especially for the smaller islands. It would also combine the territories into a larger nation, giving them more power in international negotiations. The Federation would integrate the economies through the increased movement of people, goods, capital, and ideas, which could foster development and make the West Indies less "export-propelled."²⁸ Another essential reason to federate was that it could help with exposure to recessions. Recessions faced in one country or area could be partially offset with help from another country or area. Lastly, corruption was widespread, and accountability is difficult to enforce on small, poor islands often dominated by one political party. Arthur [Lewis \(1965, p. 20\)](#) insisted, "The fundamental reason for federating these islands is that it is the only way that good government can be assured to their peoples."

The three most significant conflicts were a product of the differing visions of the Federation between Jamaica and Trinidad and dealt with economic issues: 1) Customs Union, 2) Freedom of movement, and 3) Federal finance ([Wallace, 1961](#)). Jamaica had a development program which could be interrupted by a strong federation. Therefore, the Jamaican leaders wanted a weak federation with limited financial resources of the federal government, delayed implementation of the customs union, and had no strong opinion on freedom of movement since this did not affect her.²⁹ Trinidad wanted the opposite: full implementation of a customs union, significant financial powers of the federal government funded by taxes, and a strong opinion on freedom of movement. Trinidadian officials feared that immigration into Trinidad from the smaller, less-developed islands

²⁸The Plantation School Economists of the Caribbean use this term to describe the centrality of foreign demand for incomes in the Caribbean. For reference, see [Best and Polanyi-Levitt \(2009\)](#).

²⁹The Jamaican proposal for a loose West Indian Federation is detailed in the Government Ministry Papers no. 3 (1959) and no. 18 (1960). Williams detailed the Trinidadian proposal for the federation in *The Economics of Nationhood* (1959).

could potentially reach extreme levels with the coming federation and create social disruptions.³⁰ Nonetheless, Williams felt the role of the Federation was “to bridge the gap between the relatively ‘better-off’ territories and their less fortunate brethren” (Williams, 1959, p. 10).

On May 31, 1960, Bustamante and his political party, the Jamaica Labour Party, announced their campaign against the Federation. Manley immediately responded that Jamaica would hold a referendum to decide its future in the Federation. Manley thought the Federation needed to be permanent in the people’s minds, and he never expected to lose. Time was not on Manley’s side. He wanted to work out the constitution of the Federation before the referendum took place. If not, the uncertainty could work against him at the polls. Despite Manley’s effort to speed the process up, it would take sixteen months for the referendum to take place. This lengthy period allowed Bustamante to unleash a campaign against the Federation.

The Inter-Governmental Conference in May and the London Conference in May-June 1961 finalized the proposed constitution. These two conferences confirmed the Jamaican ‘victory’ but were considered failures.³¹ The new constitution set the date of independence for the West Indian Federation as May 31, 1962. Revenue for the federal government would total only \$28.3 million a year and be exclusively derived from customs duties on items from List I.³² Income tax and industrial development could be shifted to federal control with approval from the units. The approval formula granted Jamaica permanent veto power as it was based on population. Freedom of movement and customs union would be adopted incrementally, and full adoption would occur in nine years (Mordecai, 1968, p. 374-376).

³⁰For Trinidad, customs union and freedom of movement were inseparable because a strong federation meant the poorer islands would converge with the more developed islands, like Trinidad. Therefore, there would be less reason to migrate for economic opportunities.

³¹Though, Manley reported them as ‘successes’ to increase the chance of winning the referendum (Mordecai, 1968, p. 394). They were failures because nobody left happy; the delegates refused to sign the final report (Padmore, 1999, p. 56). Even though he got what he wanted, Manley left on bad terms with the Trinidadian delegation and the smaller islands.

³²Federal negotiations established lists of goods based on their importance to development for the islands. 418 items were on List I and they were those that were deemed not important for development such as food, clothing, etc. (Mordecai, 1968, p. 316, 347).

2.4 Money and Banking System

Bloomfield was in the West Indies for two and a half weeks from December 1960 to January 1961 and then again in July 1961. At the time the West Indies was part of the sterling exchange area. There were two systems in place, the Jamaican and the Eastern Caribbean system, which oversaw Trinidad, the “eight,” and British Guiana. The Jamaican Currency Board issued the Jamaican pound, but the opening of a central bank, the Bank of Jamaica, in May of 1961 replaced the currency board. The Eastern Caribbean had the British Eastern Caribbean Currency Board that issued the British West Indian dollar.³³ The currency in each system was also legal tender in the other starting in 1955, but there was only a limited amount of inter-system circulation. Under the sterling exchange area, the exchange rates were fixed and both currencies were pegged against the sterling, which was pegged to the gold-backed US dollar. This would not change with the formation of central banks.

However, Bloomfield (1961, p. 7) states, “Banking plays a relatively more important role in the West Indies than in many other underdeveloped countries.” Compared to other countries in the “South,” the West Indies had large demand deposits held by the public, savings, and more cash in circulation. However, the commercial banks were largely foreign-owned and operated by their head offices in London. The West Indies lacked a market for government and financial securities, and the banking system was unintegrated. The Eastern Caribbean and Jamaica banks were less related to each other than with London. Creating a relationship will be a significant step for the formation of the West Indian Federal Central Bank and the integration of the area. As export-propelled economies, foreign demand determined the growth path of the West Indies. The susceptibility of these economies to external movements could be reduced through expanding domestic sectors, shifting export production to non-volatile areas, holding more local assets, and strategic counter-cyclical monetary-fiscal policy to smooth out the business cycle.

³³The currency boards were simply money changers. They issued currency to commercial banks, which were obligated to deposit an equivalent amount of sterling to the currency board’s credit in London. They redeemed currency from commercial banks by issuing out an equivalent amount of sterling.

The views on central banking arrangements reflected the differences in vision for the Federation. Trinidad favored a unified central bank of the Federation with regional banks operating as arms of the center. Jamaica favored autonomous regional banks that would cooperate through a central Federal Board but would be free to conduct their own policies. The Jamaican view, just as with the other political arrangements, won. However, Bloomfield states that Jamaican officials were open to a more centralized central banking structure once economic and political integration of the area proceeded, even if the Federation was still a loose organization overall (Bloomfield, 1961, p. 14).

The establishment of central banks would give power and responsibility to the West Indies to foster their development. Bloomfield's analysis occurred after the London Conference in June of 1961, though most was written before. The information he had was that a loose Federation would continue to exist alongside a loose central banking arrangement with regional autonomy. Jamaica had just opened its Central Bank, and the Eastern Caribbean was still under the Eastern Caribbean Currency Board, with a central bank being prepared in Trinidad.³⁴ It was unclear at the time if the rest of the Eastern Caribbean would join Trinidad or if they would create their own central bank. However, Bloomfield hoped for the former and assumed so throughout his analysis.

2.5 Bloomfield's report for the Federation

Bloomfield recognized three challenges for central banking that were specific to the West Indies: *regional cooperation, arrangement change, and local enhancement*.

In 1961, Bloomfield was a perfect candidate for Arthur Lewis and the rest of the Federation to give advice on the design of central banks. He was already an accomplished economist with experience advising central banking in developing countries during periods of conflict. In the West Indies, tensions were tight as Jamaica was threatening to leave the Federation, agreements were made behind closed doors, and politicians accused each other of personal sabotage.

³⁴Bloomfield predicted this would take at least a year to open. It took three years.

He also aimed to offer a flexible agenda applicable to various political associations and never opined on what association was best. Bloomfield's analysis would not ruffle the constitutional negotiations; however, it does leave a lot of unanswered questions, which could have helped the Federation survive. For example, Bloomfield never outlined the benefits of a federation from a monetary standpoint, which could have been vital for the Jamaican people to hear with the referendum looming. Importantly, Bloomfield was not British. At the time, British foreign monetary policy was geared toward protecting the sterling area so the unorthodox proposals of Triffin and Bloomfield that placed discretion in the hands of West Indian officials would not be the strategy of British officials (Helleiner, 2003, p. 257-263). Regarding the organization of the West Indies Federation, Bloomfield (1961, p. 14) states, "If the issue were to be decided on purely economic grounds alone, it would be difficult to reach a firm conclusion. But the issue is in large part a political one, on which an outsider may be pardoned for reserving judgement."

Unlike Bloomfield's previous missions, he was not setting up a central bank as a Federal Reserve employee but giving advice about potential central banking arrangements for a group of islands coming together in a federation. Observing the central bank statute of the Bank of Jamaica, Bloomfield was pleased with its execution and advised Trinidad to follow a similar structure. The Caribbean had plenty of professionals in this aspect. Many West Indians were trained and taught at top schools worldwide, and Bloomfield had faith they would conduct sound monetary policy in accordance with his and Triffin's approach to central banking.

Central banking in the West Indies posed challenges unique to underdeveloped countries gaining independence globally. First, *regional cooperation* was an obstacle as the Federation would be joining islands that were historically separated, especially in the case of Jamaica and the rest. There would effectively be three central banks that were free to act as they pleased for the time being.³⁵ Bloomfield (1961, p. 21) asserts, "A key requirement of the West Indian federal central banking arrangements currently envisaged, will be that of providing appropriate machinery for

³⁵Bank of Jamaica, Central Bank of Trinidad, and Central Bank of the West Indian Federation. There is also the possibility of a fourth in the Eastern Caribbean Central Bank.

some measure of co-operation and policy co-ordination between the regional central banks and the Federal Government."

In January of 1960, the British government specified that a minimum requirement for independence of the West Indian Federation was centralized control over the currency. For this reason, the subjects of "*central banking and of currency coinage and legal tender*" were placed on the exclusive list of federal powers. The wording of centralized control over currency is vague and could mean many things. It was interpreted to mean that central banks in the region must be 'centrally incorporated' but not need a common currency. Thus, a Federal central bank, under the guidance of the Federal Board, was a requirement for independence. Bloomfield mentions that a benefit to this form of organization, rather than just separate central banks, is that the West Indian central bank can more likely get membership approval from the International Monetary Fund (IMF) and the World Bank. The Federal Board's exact powers were unclear, but it would at least be a representation for the region in international organizations.

No matter the exact powers of the Board, there were situations when cooperation with it and between the two regional banks was required. An example by Bloomfield is when foreign reserve depletion is happening in one or both regions. The Board should care for the reserve position of the whole area just like the monetary board Bloomfield established in South Korea, and the regions, at least for the time being, will probably care for themselves. Without automatic currency boards, the commercial bank head offices in London will be less accommodating in extending credit to the West Indies. The Federal Board should act, but their actions will depend on whether the deficits are caused internally or externally. Internally induced deficits are usually the result of unnecessary credit expansions, so the Board should implement anti-inflationary measures.

With external deficits the situation would be trickier, and as we have documented in Section 2, a combination of counter-cyclical monetary and fiscal policies which would raise reserves during booms for use during busts could smooth out the external shocks. Also, the Federal Government, acting on approval from the Board, could potentially go to the International Monetary Fund (IMF) for loan assistance. Another option was for one or both regions to implement measures of exchange

controls or import restrictions, especially for countries in the Sterling area.³⁶ These restrictions would help keep resources within the country and therefore reduce the constraints on the balance of payments created by the deficit.

Bloomfield also mentions exchange-rate devaluations to raise exports and inter-region reserve loans if one region suffers from a drain as different examples of policies needing cooperation with the Federal Board during a negative shock. Bloomfield suggested that the final power should be given to the center during conflicts of opinion. One could forecast this being more difficult than Bloomfield imagined. There have been very few instances where Jamaica, Trinidad, and the Center have agreed.

Another challenge for the West Indies is that the central banking structure should be prepared for *arrangement change* and could look completely different in a few years. There was the potential for various alternatives, including a highly centralized arrangement. Jamaica already said they were willing to concede regional autonomy in central banking if that was the best move (Bloomfield, 1961, p. 14). Cooperation between the three Banks would also set up an easier transition to a centralized banking system in the future. Bloomfield predicted this to be the most likely path. Officials of the Federation pointed to the US Federal Reserve and the German Bundesbank as examples for central banking in the West Indies. Bloomfield disagreed, for both systems were envisioned as having regional autonomy, but they functioned as centralized systems. Bloomfield predicted this to happen, though more slowly, in the West Indies in four stages: 1) a Jamaican Central Bank and an Eastern Caribbean Currency Board; 2) a Jamaican Central Bank, a Trinidadian Central Bank, and an Eastern Caribbean Currency Board; 3) Jamaican Central bank and Eastern Caribbean Central Bank, and; 4) One centralized central bank with a common currency and regional arms in the East and Jamaica (Bloomfield, 1961, p. 17).

Bloomfield speculated increased centralization of the central banking system because of the history of other central banks. It would also be natural to pursue joint policies between the two regions because of shared care for the position of the Federation as a whole. Bloomfield (1961,

³⁶This would have to be applied to the whole area upon establishing the Customs Union.

p. 29) states, "... there will be growing pressures for increasingly centralized monetary policy formation, for broadly uniform credit policies throughout the area, and for increased assumption of powers by the federal central banking board, even if the process of centralization does not grow at the same rate on other fronts."

Finally, *local enhancement* of commercial banks and assets was another hurdle for the West Indian monetary authorities and was Bloomfield's primary policy recommendation for the nascent central bank. Banks already played an essential role but were foreign-owned, and the assets of these banks were also foreign holdings. Various monetary tools such as discount rates and reserve requirement policies might be ineffective if foreign commercial banks could go to their head offices for loans instead of the West Indian central banks. Bloomfield consulted with banking officials in the West Indies and concluded the commercial banks do not necessarily care for the sterling position of the individual West Indian territories but rather the total of all their overseas branches together.³⁷ He found that banks had the freedom to borrow without the worry of draining sterling reserves because the head offices shifted sterling from areas of surplus to deficits. Due to the ease of borrowing by the commercial banks, the ratio of assets to deposits was volatile. The volatility "has depended upon the actions of private profit-seeking banks and may not always be best suited to the needs of the individual territories or the West Indies as a whole" (Bloomfield, 1961, p. 9).

The West Indies needed to develop local commercial banks. However, the formation of central banks would change the behavior of foreign-owned commercial banks. According to Bloomfield, the monetary system would no longer be automatic, and foreign-owned commercial banks would be more cautious with their dealings in the area (Bloomfield, 1961, p. 23). Local commercial banks would more likely deposit reserves in central banks in the West Indies. The central bank will then "be in a position to exert some influence upon the lending policies of the commercial banks and thus on the amount of deposits that they could create" (Bloomfield, 1961, p. 32).

³⁷Bloomfield did state that some branches might care about the West Indies as a whole, but not the individual territories (Bloomfield, 1961, p. 8).

For development purposes, increasing local assets would be beneficial. This could help with their exposure to outside shocks and increase the production of domestic sectors. Powerful tools that could be used to help raise local assets are loan ceilings to specific categories of investments and a minimum ratio of local assets to deposit liabilities for commercial banks. However, the central banks would need to work closely with the overall economic agenda of the region because such a policy, “in the absence of suitable local outlets, could merely result in the accumulation of excess reserves by the banks” (Bloomfield, 1961, p. 33). This means that these tools should only be used if they are in line with the overall development agenda of an island or the region. This is an example of Bloomfield’s view on the complementarity between monetary and fiscal policies. Also, it highlights Bloomfield’s vision of discretionary central banking, one where the monetary authorities have room to implement policies as they see fit.

Another important aspect of local assets were markets for government and financial securities. This is central for development purposes and the area’s overall economic integration as it attracts domestic and foreign investment. Also, Bloomfield recognized the need for such markets for effective monetary policy, “open-market operations can be virtually ruled out as an anti-inflationary credit control instrument in view of the absence of a money and government securities market” (Bloomfield, 1961, p. 32). The Bank could direct resources to specific channels in line with development needs through various credit control tools, such as import restrictions, exchange restrictions, loan ceilings, and local asset requirement ratios. Bloomfield proposed curbing credit expansions during periods of balance-of-payments deficits if the cause was excessive lending from the central bank or commercial banks. During reserve surpluses, they should only expand credit sparingly. Refraining from such expansion will allow them to increase the reserve pool for use during downswings (Bloomfield, 1961, p. 19-20). It will also avoid inflationary tendencies.

For the West Indies, Bloomfield was most concerned with central banking as a means for development, which is more in line with the Triffin missions in Latin America. The reason is that West Indian officials were already “conservative” in their monetary policies, meaning they recognized the dangers of an inflationary agenda. Even when Bloomfield mentions limiting credit

expansions, it is in the context of development and only secondarily dealing with inflation. For the West Indies, avoiding credit expansion was a means to raise the reserve pool for inevitable emergency recessionary funds. Comparing Bloomfield's priority in the West Indies vs. South Korea and Indo-China illustrates the flexibility of his agenda. He did not approach central banking in a dogmatic fashion, rather he let the specific environment determine his stance.

A common theme from his previous work is that the Central bank must establish trust within the financial community internationally and domestically. During the first years, it would be difficult for a new central bank to operate fully and utilize all monetary policy tools. Instead, moral suasion could be effective in establishing local respect and building a sense of West Indian unity. "In time, however, it is to be expected that the scope of the Banks activities will grow" (Bloomfield, 1961, p. 35). Not mentioned by Bloomfield is the difficulty of pursuing moral suasion given the inexperienced Federal Central Bank and the foreign dominated commercial banks. This is even more troublesome considering the West Indian unity he relied on only existed in the Eastern Caribbean, to an extent, and not with over half the population of the region that resided in Jamaica.

Lewis claimed Bloomfield's report "was exactly what we had hoped to have."³⁸ Unfortunately, evidence of correspondence between Lewis and Bloomfield is limited to the invitation letter and a brief thank you letter. However, the reception was not all praise. Prominent Caribbean economists, Lloyd Best and Alister McIntyre, published an article related to federal central banking after reading Bloomfield's unpublished draft (Best and McIntyre, 1961). Although Best and McIntyre (1961) do share some commonalities with Bloomfield (1961), they challenged Bloomfield's stance on multiple fronts. In common, they both saw that the purpose of central banks in the area was to insulate the economy from external demand shocks. Also, there was agreement that central banks should be equipped with wide-ranging tools including foreign exchange controls.

However, for Bloomfield, the promotion of development was important, but if it led to internal instability, it should be abandoned. Best and McIntyre (1961, p. 353) put forth the opposite: "In

³⁸Arthur Lewis to Arthur Bloomfield, 9 June 1961, box 1 (incoming correspondence), folder 1961, Arthur Bloomfield Papers, David M. Rubenstein Rare Book & Manuscript Library, Duke University.

respect of policy objectives we take it that top priority in Jamaica should be given to the fostering of economic growth, which so far as it involves monetary policy, requires the Authorities within the limits of their competence, to encourage the provision of maximum credit at minimum cost in support of productive investment." The West Indian economists felt that some inflation was necessary for economic development.

They also had competing views about the effectiveness of moral suasion. For [Bloomfield \(1961\)](#), moral suasion was a powerful tool because of the ineffectiveness of monetary policy and the small number of commercial banks. [Best and McIntyre \(1961\)](#) were more skeptical that commercial banks would respond accordingly to moral suasion.³⁹ They state, "commercial banks are profit-oriented and owe allegiance to an outside system, there is no warrant for presuming that they will respect 'the nod from local headquarters' except under very special conditions" (p. 358). [Best and McIntyre \(1961\)](#) recognized the limitations of a new, weak central bank who had no real control over the actions of the commercial banks.

Although Bloomfield was made aware of the publication by Best and McIntyre, he did not address it. The instance is vital because it shows the differences in opinion between an outsider and those on the inside. The domestic economy and institutional framework of the West Indies was harmed by years of slavery, colonialism, extraction, racism, inequality, etc. For [Best and McIntyre \(1961\)](#), the establishment of central banks granted the opportunity to break ties with the relations that has made the West Indies dependent on their colonizer and other advanced nations. They saw the need for drastic change which necessitates large credit expansions by the central bank, "We see it as one of making a break with the past by undertaking a total reorganization of the local economy and of the institutions which service it" ([Best and McIntyre, 1961](#), p. 363). Bloomfield agreed that the local economy needed to be transformed but preferred gradual measures without large credit expansions. Regardless of who was right, Bloomfield did not share the same sentiments as those who have been raised and are living in the region.

³⁹In this passage, [Best and McIntyre \(1961, p. 358\)](#) cite Bloomfield directly.

Bloomfield conducted his analysis of central banking arrangements carefully. He avoided taking political sides, and no matter the type of arrangement the West Indies decided on or evolved to, his suggestions could still be applicable. The priority for the early years of the Central Bank was to increase their local assets to assist with development in the future: commercial banks, investments, and securities markets. Unlike his mission to South Korea, his concern over inflation was secondary. Bloomfield advocated for discretionary central banking to decide what is the best course of action. It was clear to Bloomfield that the Federation would start loosely on all fronts; the challenge for the West Indies would be integrating the economies. The Central Banks could assist in this operation naturally through cooperation, but more is needed. "It need hardly be said that this larger problem [that of economic integration and development] will pose a major challenge to students of West Indian affairs, to say nothing of the authorities themselves, for many years to come" (Bloomfield, 1961, p. 36).

2.6 Despite Disintegration

Bloomfield had to confront a new institutional framework during his trip to the West Indies. He recognized three unique complications of central banking for the Federation: *regional cooperation, arrangement change, and local enhancement*. Regarding Bloomfield's report, Lewis stated "It will be of enduring use to those who have to set up and work a system over the next few years."⁴⁰ Unfortunately, Jamaica left the Federation before the report was released.⁴¹ "But when the page proofs were in my hands, the Federation of the West Indies was dissolved and my report was thus no longer directly relevant" (Bloomfield, 1994, p. 15).

After the referendum, the editor attached a note to the publication, "Though much of the analysis and conclusions may now appear no longer directly relevant, the report is being published because of its contribution to the problem of central banking in a federal area" (Bloomfield, 1961,

⁴⁰Arthur Lewis to Arthur Bloomfield, 9 June 1961, box 1 (incoming correspondence), folder 1961, Arthur Bloomfield

⁴¹The referendum was held on September 19, 1961. 54.1% of the votes were in favor of leaving the Federation (Faber, 1964, p. 303).

p. 1). This statement could be taken a step further in that its contribution is vital for the West Indies, regardless of whether it is a federal area. His report touches on problems still relevant, such as being export-propelled and increasing local ownership, and the integration process has not died in the West Indies. Lewis (1965, p. 37) claimed, "But it is the inescapable destiny of Trinidad, British Guiana, and the other British islands to link their fortunes together. It will undoubtedly begin with confederation, rather than Federation, a common nationality, a common currency, and common representation abroad. Once established, the links will grow like ivy."

Despite Lewis' efforts to salvage the Federation, the islands went their separate ways.⁴² Prime Minister Adams wrote to Lewis in November of 1961, "If, as we all hope, the situation created by the Referendum in Jamaica can be used to make a new and more constructive start, this will in large measure be due to your personal efforts."⁴³ The Trinidadian delegation was not having it, and Williams famously stated, "Ten minus one equals zero" (Mordecai, 1968, p. 426-427). Williams announced Trinidad was going at independence alone and that the other islands could join them in a unitary state if desired, and the Federation dissolved.⁴⁴

Regardless of going their separate ways, the desire for integration and cooperation remains, and several organizations have been developed for this purpose. The Caribbean Community and Common Market (CARICOM) is a customs union representing fifteen Caribbean nations of all backgrounds, including all those in the Federation, was established in 1973. The "eight," except Barbados, joined together in the Organization of Eastern Caribbean States (OECS) in 1981, which acts as a confederation with harmonized policies. The CARICOM Single Market Economy

⁴²Lewis' attempts from 1961-1965 are documented in a personal outcry, *The Agony of the Eight* (1965). Lewis' travel logs also indicate that he traveled to every island in the Federation at least once, plus British Guiana, in one month in October 1961. Travel itinerary, (no date), box 19, folder 4. W. Arthur Lewis Papers; Public Policy Papers, Department of Special Collections, Princeton University Library.

⁴³Grantley Adams to Arthur Lewis, 9 November 1961, box 2, folder 3. W. Arthur Lewis Papers; Public Policy Papers, Department of Special Collections, Princeton University Library.

⁴⁴Grenada was next to leave and later accepted Trinidad's invitation to join a union but was denied by Trinidad due to the financial burden (Lewis, 1965, p. 11). The next four years were marked by conflict, just as the previous four. The Federation's plans never happened, and Barbados got its independence in 1966 which unofficially marked the end for the Federation. Throughout the 1970s and 1980s, Grenada, Dominica, St. Lucia, St. Vincent and the Grenadines, Antigua and Barbuda, and St. Kitts and Nevis also received their independence. Anguilla and Montserrat remain British Overseas Territories to this day.

(CSME) was established in 2001 to create a single economic space. The CSME includes most members of CARICOM; effectively, they are a common market with hopes of becoming a complete economic union with free movement of people across the region.⁴⁵ This might not be the “ivy” Lewis predicted, but seeds have been planted and show some life. On this point, Bloomfield (1961, p. 30) stated, “The problem of achieving genuine economic integration of the area would, however, still remain for some time to come.”

Today, four central banks exist in the area which once was the West Indian Federation: those of Jamaica, Trinidad, Barbados, and the OECS has a central bank known as the Eastern Caribbean Central Bank (ECCB). Assessing the degree of cooperation between the four central banks is difficult, but it is certainly not what Arthur Bloomfield envisioned. For example, Jamaica and Trinidad operate under a floating exchange regime, while Barbados and the OECS peg their currency to the dollar. However, with the further development of the CSME, cooperation and integration will rise.

Bloomfield’s episode in the West Indies was short, but considering the rest of his career it provides a useful illustration of money doctoring in the post WWII period. Bloomfield was not ideologically tied to one set of policies. In South Korea and Indo-China, he went against the typical strategies of Triffin in Latin America as his primary focus was not internal development. However, analyzing his efforts in the West Indies shows that his approach was much closer to Triffin’s and different than his previous missions. Money doctors of Bloomfield’s era allowed their strategies to be determined by the environment in which they were in, and Bloomfield did just that.

⁴⁵In a meeting in 2023, they agreed to the free movement of persons for skilled labor in the region.

Chapter 3

Uneven Development with an Unlimited Supply of Labor

3.1 Introduction

Uneven economic development between the Global North and South remains a central issue in international economics. While balance-of-payments constrained growth (BPCG) models, such as Thirlwall's Law (Thirlwall, 1979), emphasize the role of income elasticities in shaping long-run growth differentials, earlier contributions from Arthur Lewis and Ragnar Nurkse suggest that domestic productivity plays a crucial role. Specifically, Lewis (1954, 1978, 1980) argued that low internal productivity in the South suppresses wages and weakens terms of trade, limiting the potential for economic convergence. Similarly, Nurkse (1971) contended that underdeveloped domestic markets constrain industrial growth and reinforce external dependency.

The internal economy refers to production for domestic consumption. The reason why it is lower for countries in the South is related to Lewis' concept of the informal sector.⁴⁶ This sector produces essential products for domestic consumption, such as food, clothing, homes, furnishings, etc., in underdeveloped countries (Lewis, 1954). The informal economy has low marginal productivity and is not covered by formal arrangements. If a large proportion of workers are within this sector, which is inherently less productive than a modern sector with higher levels of technology and better organization, then this will limit the overall productivity of the economy. The argument is therefore not *what* the South produces, but *how* they produce it. Lewis (1978, p. 37) summarizes:

“The terms of trade are bad only for tropical products, whether agricultural or industrial, and are bad because the market pays tropical unskilled labor, whatever it may

⁴⁶The informal sector is “the farmers, the casuals, the petty traders, the retainers (domestic and commercial), women in the household, and population growth” (Lewis, 1954, p. 4) with a low marginal productivity. The International Labour Organization (ILO, 2024) defines it as “all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements.”

be producing, a wage that is based on an unlimited reservoir of low-productivity food producers."

Raising productivity of the informal economy does not mean they need to produce modern manufactures, be owned by large capitalist firms, or have their workers migrate to urban areas. Instead, it is the informal economy's production that needs to be transformed, as they produce essential products for domestic consumption. Exporting sectors in underdeveloped countries often have no relationship with the domestic economy. The production is not consumed internally, and foreign-owned multinational corporations siphon profits. These sectors can have high productivity, ample capital intensity, and have all the signs of being 'modern,' but this does not spill over to the internal economy. A rise in the productivity of the internal sector will assist in connecting the exporting and domestic economy. The extra purchasing power can be used to consume the export product domestically and for entry into new industries. In turn, this will boost the production of the exporting sectors and create a cumulative cycle of growth.

This paper integrates these perspectives by extending the BPCG framework of [Dutt \(2002\)](#) to incorporate domestic sector productivity as a key determinant of trade elasticities. I propose that low productivity in the informal sector weakens the South's elasticity ratios, export elasticity divided by import elasticity, while increasing import dependence, leading to persistent trade imbalances and slower growth. In contrast, improving internal productivity expands the domestic market, enhances terms of trade, and facilitates North-South convergence. This occurs because food, clothing, and other essentials will be more readily available domestically so that extra income is generated for the consumption of other products. Reminiscent of Say's Law, this extra supply creates demand, causing new industries to form, or old ones to grow. The growth will alleviate the country's dependence on imports and also increase the range of exports, thus improving elasticity ratios. In the BPCG framework, terms of trade leads to long-run growth. Instead, if the country

increased productivity of the modern exporting sectors, the benefits accrue to the importing country due to lower prices, thus possibly lowering the relative incomes of the economy and forcing workers into informality.⁴⁷

To test these predictions, I estimate elasticity ratios for a panel of countries from 1985 to 2019, analyzing their relationship with internal productivity, informal sector growth, and export composition. The results indicate that countries with declining informal sectors and rising domestic productivity exhibit higher elasticity ratios and stronger long-term growth. These findings suggest that strategies focused solely on export diversification may be insufficient—raising internal productivity is critical for sustained economic development.

The paper is structured as follows: Section (3.2) reviews the literature on BPCG and North-South divergence. Section (3.3) presents the theoretical model, extending Dutt (2002) to include the role of internal productivity. Section (3.4) and (3.5) provides empirical evidence on the relationship between internal productivity, trade elasticities, and growth, and Section (3.6) concludes.

3.2 Literature Review

Balance-of-payments constrained growth (BPCG) models argue that long-run economic growth is limited by external trade constraints rather than domestic supply factors. Thirlwall (1979) formalized this idea, showing that a country's growth rate depends on the ratio of export to import elasticities, a relationship known as Thirlwall's Law. In this framework, countries with low export elasticity relative to import elasticity experience slower growth due to persistent trade imbalances.⁴⁸

⁴⁷“The main reason why tropical commercial produce is so cheap, in terms of the standard of living it affords, is the inefficiency of tropical food production per man. Practically all the benefit of increasing efficiency in export industries goes to the foreign consumer; whereas raising efficiency in subsistence food production would automatically make commercial produce dearer” ((Lewis, 1954, p. 30).

⁴⁸For a historical overview of BPCG, see Thirlwall (2012), and for a review of the recent extensions, see Blecker (2022).

Dutt (2002) extended BPCG models to analyze North-South divergence, arguing that the South's structural trade disadvantages stem from the nature of its trade elasticities. In the long run, terms-of-trade must adjust so the BP equilibrium holds. If the import elasticity of demand of the South is greater than that of the North, terms-of-trade will move unfavorably for the former and result in uneven development. Subsequent studies, including Vera (2006), Sasaki (2008-09, 2021), and Spinola (2020) incorporated financial flows, trade imbalances, technological change, and productivity gaps highlighting additional mechanisms of divergence.

According to the Prebisch-Singer hypothesis (Prebisch, 1962; Singer, 1950), the price of primary commodities declines relative to manufacturing goods. Assuming that the South exports mainly primary products, while the North exports manufactured, terms-of-trade will move unfavorably for the South. Although due to different assumptions, Thirlwall's Law and the Prebisch-Singer hypothesis argue that the type of exports are the main cause of uneven development.

However, development economists, particularly Lewis (1954, 1978, 1980); Nurkse (1971), emphasized an alternative explanation: the South's growth constraints stem from low internal productivity rather than the composition of exports alone. Lewis argued that surplus labor in a low-productivity traditional sector depresses wages across all sectors, making Southern exports structurally cheaper regardless of their type. Nurkse extended this argument, asserting that underdeveloped domestic markets limit industrial expansion, reinforcing external dependence.

Studies have examined the role of elasticity ratios in shaping growth dynamics. Krugman (1989) challenged Thirlwall's causal mechanism, arguing that growth rates determine elasticity ratios, rather than the reverse. Recent empirical work (Bölükbaşı and Cıvırcı, 2024; Gregori and Giansoldati, 2020) finds that elasticity ratios are influenced by factors beyond export composition, including productivity and domestic market size. For a full review of the theoretical and empirical history of North-South divergence, see Darity (2005), which overviews various explanations of divergence, not only elasticity ratios.

This paper contributes to the literature by explicitly linking domestic productivity to elasticity ratios within a BPCG framework. While previous models (Darity, 1982; Krugman, 1994; Spinola,

2020) have explored aspects of Lewis-Nurkse dynamics, they have not fully integrated these ideas into a formal BPCG model. I argue that improving internal productivity reduces import dependence, strengthens terms of trade, and facilitates long-run convergence between the North and South. The current model, combines the endogenous elasticity ratios of [Krugman \(1989\)](#) with the exogenous ratios of [Thirlwall \(1979\)](#) and [Dutt \(2002\)](#).

3.3 Model

The model follows [Dutt \(2002\)](#), except the North and South have the same production function and are supply constrained.⁴⁹ We also make three unique assumptions. First, the two regions, North and South, export the same differentiated product, but the elasticity of demand for imports/exports are determined by growth of domestic productivity. Second, the South has workers in the informal sector, whereas the North does not. This is a simplified assumption as informal employment exists in all countries, but there is more in the South. The North operates on the frontier of domestic productivity, while domestic productivity of the South is kept low due to informal employment. Therefore, under these assumptions the Northern elasticity ratio is greater than the Southern, $\frac{\epsilon_N}{\epsilon_S} < 1$, where ϵ_N is the income elasticity of Northern imports (Southern exports) and ϵ_S is the income elasticity of Southern imports (Northern exports).

Third, we introduce a dynamic equation to explain the evolution of the elasticity ratio. Local consumption can be produced by the modern or the informal sector.⁵⁰ The key to raising formality and combating uneven development is improving internal productivity through government policy, as explained by [Nurkse \(1971\)](#) and [Lewis \(1978, 1980\)](#). Unlike [Spinola \(2020\)](#), there is a need for balanced growth between the modern and internal producing informal sectors. The former growing without the latter is equivalent to growth only in the exporting sector, which does not improve elasticity ratios. The model developed simultaneously determines elasticity ratios, terms of trade, and growth.

⁴⁹Nominal wages vary in the South, but distribution is held constant so prices rise equally with wages.

⁵⁰For the North, there is just the modern sector.

There are no intermediate goods, and both regions produce with fixed proportions of capital and labor. The two production functions, Y_S and Y_N , are the output of differentiated goods the modern sector produces in the two regions. We assume the informal economy does not trade and does not contribute to growth. The production functions are:

$$Y_i = K_i/a_i \quad (3.1)$$

$i \in (S, N)$, S represents the South and N represents the North. Where K_i and a_i are the capital stock and fixed capital-output ratio for the specific region, i . Producers set prices, P_i according to a markup formula:

$$P_i = (1 + z_i)W_i b_i \quad (3.2)$$

z_i is the given markup rate, W_i is the wage of each respective region, and b_i is the unit labor requirement. We assume these three variables are fixed. Each region has capitalists and workers. Capitalist's share of income, or profit share, is σ_i . Using Equation (3.2), this takes a value of $z_i/(1 + z_i)$. Likewise, the wage share will be $1/(1 + z_i)$.

Northern capitalists and workers spend a portion α of their consumption on the Southern good and the rest in the North. For the South, workers and capitalists spend a portion β of their consumption on the Northern good.⁵¹ In both regions, Capitalists can save s_i , but workers do not.

$$\alpha = \alpha_0 Y_N^{\epsilon_N - 1} P^{1 - \mu_N} \quad (3.3)$$

$$\beta = \beta_0 Y_S^{\epsilon_S - 1} (1/P)^{1 - \mu_S} \quad (3.4)$$

Equations (3.3) and (3.4) give the share of Northern and Southern spending, respectively, going to the other region. ϵ_i is the income elasticity of imports for each region, $P = \frac{P_S}{P_N}$ is the terms of trade⁵², and μ_i is the price elasticity of imports for each region. Since the South has workers in

⁵¹This is different from Dutt (2002), who assumes only capitalists spend money on the Northern good.

⁵²I assume nominal exchange rate is fixed at 1

informality with low domestic productivity, $\epsilon_S > \epsilon_N$.⁵³ Informality keeps internal productivity low and limits the domestic market. As the South grows, it will purchase a greater share of products from the North because it is constrained domestically. As incomes in the North grow, the South will not be able to respond as well to increased demand from the North if there are sections of the workforce in the informal economy. Without the ability to upgrade to new products or increase industry scale, the North will have to look elsewhere as their demand changes.

Equation (3.5) below gives the investment function for Northern firms. I_N is investment in the North, which is assumed to come solely from the northern good. Equation (3.6) shows value of investment for the South, where $\zeta < 1$. Investment can be from the northern or southern good.⁵⁴ However, this is not the same as outsourcing. Southern capitalist must purchase the northern good for investment. For simplicity, we assume no outsourcing in the model, but we consider its potential effects in a later section. In both regions, capitalist savings is automatically channeled into investment.

$$\frac{I_N}{K_N} = \frac{s_N \sigma_N}{a_N} \quad (3.5)$$

$$\frac{I_S}{K_S} = \frac{P^\zeta S_s}{K_S} \quad (3.6)$$

We can yield equations for the value of southern (3.7) and northern exports (3.8):

$$P_S X_S = \alpha[(1 + (1 - s_N)z_N)/(1 + z_N)]P_N Y_N \quad (3.7)$$

$$P_N X_N = \beta P_S Y_S \quad (3.8)$$

Then, by plugging Equation (3.3) into (3.7), (3.4), and (3.8) we get the following:

$$X_S = \theta_S P^{-\mu_N} Y_N^{\epsilon_N} \quad (3.9)$$

⁵³This is the same as Dutt (2002), but the reasons are different.

⁵⁴Since investment is a composite of northern and southern goods, the investment price index is $P_S^I = P_N^\zeta P_S^{1-\zeta}$. Where ζ is the share of northern good in investment and is exogenously given. We could use β for this variable, but it would complicate the model. The value of investment in the South is equal to the value of savings: $P_N^\zeta P_S^{1-\zeta} I_S = P_S S_S$. So, $I_S = P^\zeta S_S$.

$$X_N = \theta_N(1/P)^{-\mu_S} Y_S^{\epsilon_S} \quad (3.10)$$

$\theta_S = \alpha_0[1 + (1 - s_N)z]/(1 + z)$ and $\theta_N = \beta_0$ are distribution coefficients which I assume to be positive constants. Equations (3.9) and (3.10) show the quantity of exports from the South and the North. Next, the excess demand function for South is: $ED_S = C_{SS} + C_{ST} + I_{SS} + X_S - Y_S - Y_{ST}$. C_{SS} denotes consumption in the Southern modern good, Y_S . I_{SS} is investment in in the Southern good and C_{ST} is consumption in the informal sector output, Y_{ST} . Since $Y_S = C_{SS} + I_{SS} + M_S$, $Y_{ST} = C_{ST}$, and $M_S = \frac{X_N}{P}$, the excess demand function becomes $ED_S = X_S - (1/P)X_N$. We can combine this with Equations (3.1), (3.9), and (3.10) to get:⁵⁵

$$P = \left[\left(\frac{\theta_S}{\theta_N} \right) \left(\frac{K_N}{a_N} \right)^{\epsilon_N} \left(\frac{a_S}{K_S} \right)^{\epsilon_S} \right]^{1/(\mu_N + \mu_S - 1)} \quad (3.11)$$

In the long run, the accumulation rate $g_i = I_i/K_i$ determines growth rates in the North and South. Northern growth rate is found in Equation (3.5). Savings in terms of the southern good is $S_S = s_s \sigma Y_S$. Combining this with Equation (3.6), we get the southern growth rate:

$$g_S = \frac{s_s P^\zeta \sigma_S}{a_S} \quad (3.12)$$

Through differentiation of Equation (3.11), we get the following term for the evolution of the terms of trade, which is the same as Dutt (2002):

$$\hat{P} = \left[\frac{1}{(\mu_N + \mu_S - 1)} \right] \epsilon_S \left(\frac{\epsilon_N}{\epsilon_S} g_N - g_S \right) \quad (3.13)$$

Equations (3.5) and (3.12) tell us that P does not affect northern growth rates but does alter growth for the South. For now lets assume $\frac{\epsilon_N}{\epsilon_S}$ is fixed at some level less than one so that we can directly compare with Dutt (2002). In the long-run $\hat{P} = 0$ so it must be the case that $\frac{\epsilon_N}{\epsilon_S} g_N = g_S$. Since we assumed the elasticity ratio to be less than 1, then at the steady-state of P , $g_N > g_S$. In

⁵⁵Marshall-Lerner condition holds so $\mu_N + \mu_S > 1$

other words, the North will grow faster than the South, and uneven development will occur due to low domestic productivity harming elasticity ratios. Figure (3.1) depicts the argument.

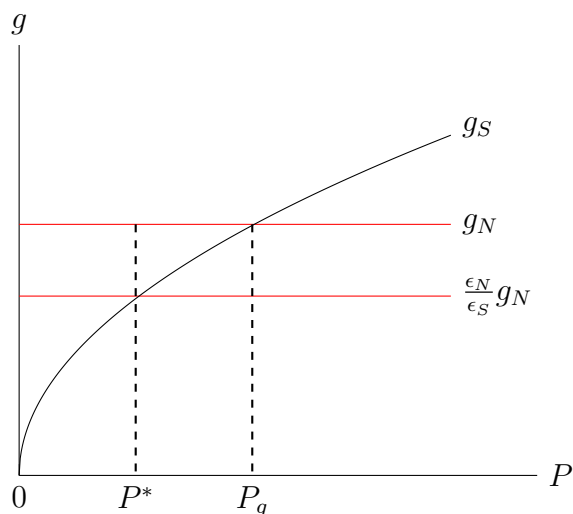


Figure 3.1: Long-run Dynamics of P and g_i

In the long run, prices will settle at P^* because this is where $\frac{\epsilon_N}{\epsilon_S}g_N = g_S$. At this point, $g_S < g_N$. The $\frac{\epsilon_N}{\epsilon_S}g_N$ line lies below the g_N because of relatively lower domestic productivity in the South. If the world started at a position of P_g , the two growth rates will be the same, but $\frac{\epsilon_N}{\epsilon_S}g_N < g_S$ so prices will have to fall according to Equation (3.13). As prices fall, g_S will also fall because of Equation (3.12). Eventually, the world will settle at the steady-state P^* . Regardless of the starting point, P^* will be reached, and uneven development is inescapable.

3.3.1 Subsistence Productivity

Elasticity ratios are determined by the ratio of formal employment f to total employment N . Where $f = A/Y_S^\phi$ and N is total population so that there is zero unemployment. A is internal productivity, and $\phi < 1$ is a positive constant. The formal employment function highlights the importance of balanced growth across all sectors of the economy.

$$\frac{\epsilon_N}{\epsilon_S} = f/N \tag{3.14}$$

For a given A , a higher output of the formal sector, Y_S , requires more employment in the informal sector. However, because we assumed fixed proportions of capital and labor in formal production, Y_S can only rise if A rises proportionally with labor released from informality. Balanced growth is a relevant assumption because workers and capitalists rely on the internal product for some essential goods. Low domestic productivity limits purchasing power and weakens demand for other products. Nurkse (1971, p. 126), states “The rate at which any one industry can grow is inevitably conditioned by the rate at which other industries grow.” Raising internal productivity releases workers into other sectors of the economy and improves the purchasing power of the country. The evolution of the elasticity ratio takes the following form, with the assumption that there is zero population growth:

$$\frac{\hat{\epsilon}_N}{\epsilon_S} = \dot{A} - \phi g_S \quad (3.15)$$

\dot{A} signifies the growth in internal productivity. Balanced growth requires internal productivity to grow proportionately to output growth in the long run. Next, I allow the government to tax income (Y_S) at a rate of τ and use the tax revenue as investment for raising internal productivity. Therefore, internal productivity rises as a Southern incomes grow and at higher tax rates. let $\dot{A} = (\tau g_S)^\psi$ and $\psi < 1$, to signify diminishing returns from government investment. Now, I attain the dynamic equations by plugging Equation (3.12) into (3.13) and (3.15), and implementing the tax:

$$\hat{P} = \left[\frac{1}{(\mu_N + \mu_S - 1)} \right] \epsilon_S \left(\frac{\epsilon_N}{\epsilon_S} g_N - \frac{(1 - \tau) s_s P^\zeta \sigma_S}{a_S} \right) \quad (3.16)$$

$$\frac{\hat{\epsilon}_N}{\epsilon_S} = \left(\frac{\tau s_s P^\zeta \sigma_S}{a_s} \right)^\psi - \phi \frac{(1 - \tau) s_s P^\zeta \sigma_S}{a_S} \quad (3.17)$$

We can solve these two equations for steady-state values of P and $\frac{\epsilon_N}{\epsilon_S}$. As the Mashall-Lerner condition holds, the steady-state will be asymptotically stable.⁵⁶ The steady-states, Equations

⁵⁶The trace of the Jacobian is negative, and its determinant is positive, as shown in the Appendix.

(3.18) and (3.19), and corresponding phase-diagram, Figure (3.2), are shown below.

$$P_{ss} = \left[\frac{\tau^{\frac{\psi}{1-\psi}}}{[\phi(1-\tau)]^{\frac{1}{1-\psi}}} \left(\frac{a_S}{a_S \sigma_S} \right) \right]^{\frac{1}{\zeta}} \quad (3.18)$$

$$\frac{\epsilon_N}{\epsilon_S}_{ss} = \left(\frac{\tau}{1-\tau} \right)^{\frac{\psi}{1-\psi}} \frac{1}{g_N \phi^{\frac{1}{1-\psi}}} \quad (3.19)$$

Now, $g_{ss} = \left(\frac{\tau}{1-\tau} \right)^{\frac{\psi}{1-\psi}} \phi^{\frac{1}{\psi-1}}$. Equilibrium is reached regardless of the original values of $\frac{\epsilon_N}{\epsilon_S}$ and P . At the steady-state, $g_N > g_S$ just as before because $\frac{\epsilon_N}{\epsilon_S}_{ss} < 1$. In this model, informal employment harms domestic productivity which decreases the elasticity ratio and leads to unfavorable terms-of-trade. The terms-of-trade are then directly responsible for the uneven development of the North and South. Also, It must hold that $\dot{A} < \phi g_N$ if there is informal employment. The key to escaping uneven development is clearly through internal productivity growth, \dot{A} , by way of government taxes.

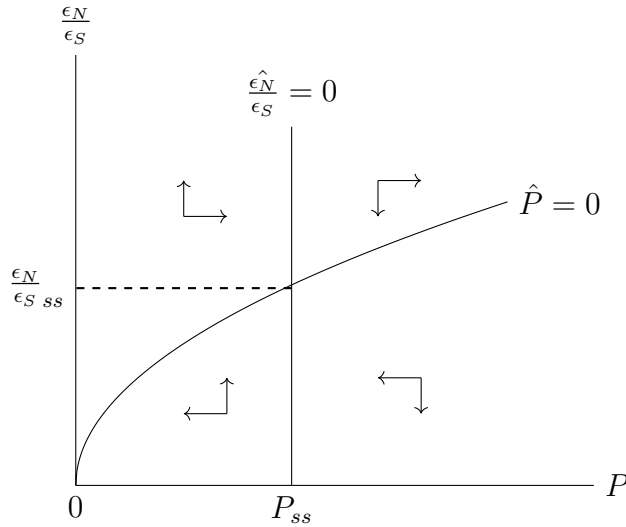


Figure 3.2: Phase diagram of P and $\frac{\epsilon_N}{\epsilon_S}$

The phase diagram of Figure (3.2) depicts dampened clockwise oscillations until it reaches the steady-state in the long run. There will be periods of favorable terms-of-trade to the right of the $\frac{\epsilon_N}{\epsilon_S}$ nullcline, bringing the southern growth rate closer to that of the North. For example, starting at

a position in the lower left quadrant with low levels of P and $\frac{\epsilon_N}{\epsilon_S}$ means the formal economy will grow because $\dot{A} > \phi g_S$. However, with a higher $\frac{\epsilon_N}{\epsilon_S}$, P will begin to grow, and now we are in the upper left quadrant. Over time, as P grows, $\frac{\epsilon_N}{\epsilon_S}$ will fall (upper-right), and eventually, both will fall (lower-right). The oscillation will restart but at a value closer to the steady-state point.

In Equation (3.17), an increase in taxes τ , all else equal, will raise \dot{A} and cause $\frac{\hat{\epsilon}_N}{\epsilon_S}$ to be positive. In the long run, g_S will have to adjust to this new level of \dot{A} . The adjustment will happen through P according to Equation (3.16) because $\frac{\epsilon_N}{\epsilon_S}$ will be higher, so $\hat{P} > 0$. P and $\frac{\epsilon_N}{\epsilon_S}$ will rise, but the oscillations will begin and, eventually, reach the new steady-state at a point corresponding to a higher value of τ , \dot{A} , P_{ss} and $\frac{\epsilon_N}{\epsilon_S}_{ss}$. Using Equation (3.12), the rise in P will increase the growth rates of the South.

The situation is illustrated in Figure(3.3). The higher taxes increase $\frac{\hat{\epsilon}_N}{\epsilon_S}$ nullcline to $\frac{\hat{\epsilon}_N}{\epsilon_S}_1$ with a new steady-state that has a higher P and $\frac{\epsilon_N}{\epsilon_S}$ as shown in the left panel of the figure. At the same time, there will be an upward shift in $\frac{\epsilon_N}{\epsilon_S}g_N$ to $\frac{\epsilon_N}{\epsilon_S}_1g_N$ and a new equilibrium price at P_1 . At the new price, g_S will be greater than g_N . It is not rare for Southern countries to go through periods of catching up to the North, the key is to sustain the growth of domestic productivity to overcome uneven development.

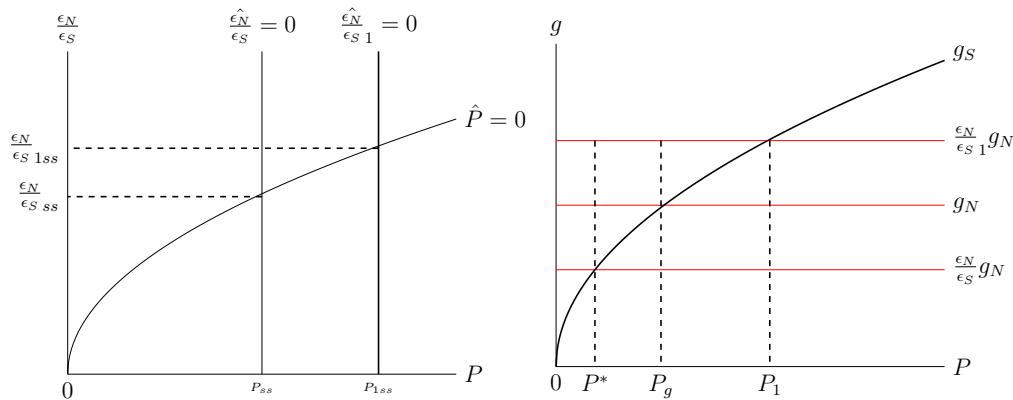


Figure 3.3: An Increase in Tax Rates

3.3.2 Outsourcing and Tourism

I do not formally include outsourcing in the model. However, if the North outsourced part of its production to the South due to cheaper costs, it would not solve uneven development under the assumptions of the model. The reason is that outsourcing primarily benefits exporting sectors rather than the internal economy, and a necessary condition for convergence is raising internal productivity. While it has the potential to increase labor productivity a_S in the South, it ultimately fuels Northern growth by raising its savings rate.

The model is particularly relevant to countries with large informal sectors and disconnected domestic and exporting industries—such as those in the Caribbean. In these nations, exporting sectors are heavily reliant on tourism. In theory, tourism should stimulate the domestic economy, as visitors spend money on food, hospitality, and entertainment—all of which are produced locally. However, tourism in this region is largely dominated by resorts and cruise lines that facilitate mass tourism. The issue with this industry structure is that most visitors pay for their vacations through all-inclusive packages, covering food, drinks, and entertainment. As a result, spending that could have circulated within the local economy is instead captured by large travel companies. These companies, often foreign-owned, import most of their products from outside the region, further limiting economic benefits for the host countries.

From the perspective of a tourist-dependent country, tourism exhibits an extremely high elasticity of demand as an industry. However, this demand does not spill over into other sectors, leaving the economy with disconnected domestic and trade sectors. Consequently, domestic productivity remains low, economy-wide elasticities remain poor, and the terms of trade stay unfavorable for Caribbean nations.

3.4 North vs. South

In this section, I present some stylized facts related to uneven development that suggests the model presented has traction. The importance of manufacturing exports has been well documented.

However, it is not clear that the movement from agricultural to manufacturing exports is the solution to uneven development for the South. The data suggests that although the south is increasing its manufacturing share of exports, uneven development is still occurring, potentially due to the persistent gap in internal productivity.

Figure (3.4) shows the change in income over time for the North and the South, split into three regions: Africa, Asia, and Latin America and the Caribbean (LAC)⁵⁷. From 1980 to 2021, the income gap between the North and South increased. Asia has the highest income of the South and an average annual per capita growth rate of 2.5% from 1980-2021. As a region, Asia is the only one closing the gap on the North. Of course, this is an average and there are many countries within Asia that are not closing the gap. For comparison, the average annual per capita growth rate for African nations was 1.00%, LAC 1.36%, and the North 2.03% across 1980-2021, respectively.

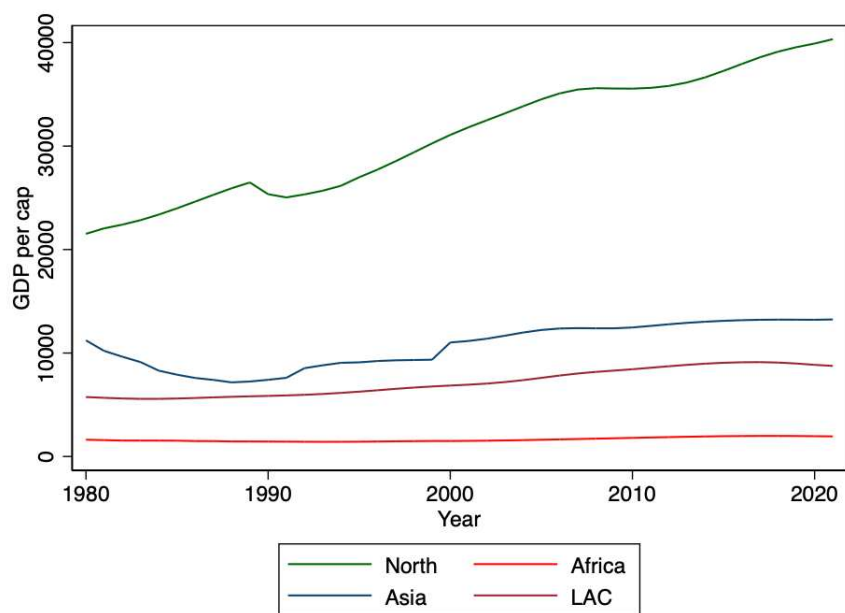


Figure 3.4: Incomes over time

Notes: Data on GDP is from the World Bank World Development Indicators (World Bank, 2023). The data were filtered using Hodrik-Prescott. GDP per capita over time of each respective region

⁵⁷The regions are classified according to UNCTAD. We have a total of 121 countries. For a complete list of the breakdown, see Table (B.1) in the Appendix

The evolution of the dependence on primary product exports is in Figures (3.5) and (3.6)⁵⁸. The former shows the share of primary products in total exports for the four country groups. The North has the lowest share of primary exports, which has been relatively constant over time. On the other hand, the regions of the South have seen a decline in the share of primary exports. Therefore, the South has been diversifying its exports away from primary products.

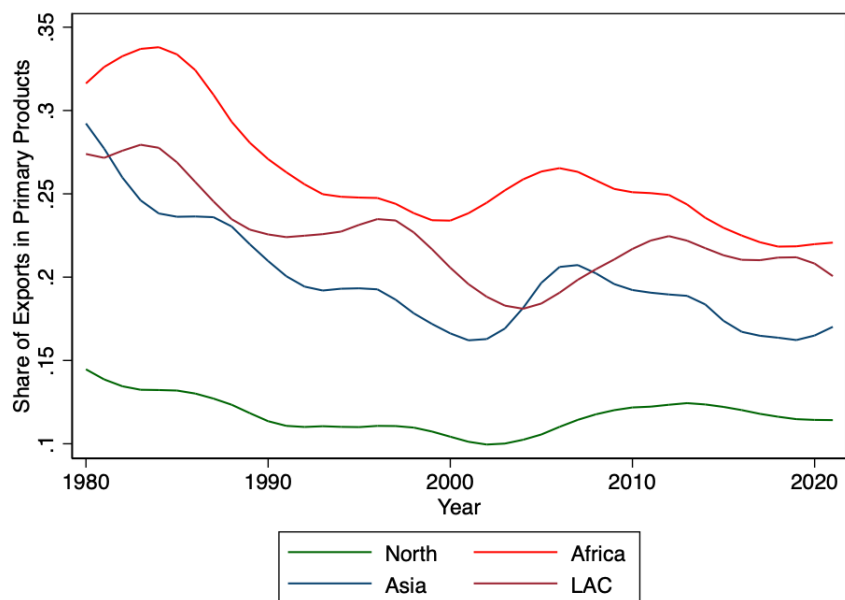


Figure 3.5: Primary Export Shares

Notes: Trade data is from the Atlas of Economic Complexity (Atlas, 2022). The data was filtered using Hodrik-Prescott. Figure shows the evolution in the share of primary exports from each specific region.

Figure (3.6) depicts net primary exports by direction. For Southern countries, it is trade with the North and vice-versa for the Northern countries. The measurement of net exports is exports divided by imports. The horizontal line is where net exports are equal to zero. Historically, the North has been an average net importer of primary products, but they are showing signs of reversing this trend. In 2021, they are right on the verge of becoming net exporters. The Southern regions have been decreasing their net exports of primary products. If the trend continues, they will soon become

⁵⁸Exports are classified according to UNCTAD. Primary products are the following SITC product categories: Food and live animals, beverages and tobacco, crude materials, animal and vegetable oils, mineral fuels, and non-ferrous metals

net importers. The world economy's production structure has been undergoing significant changes as the North and South alter their trade relationships. Figures (3.5) and (3.6) signify that the uneven development found in Figure (3.4) can not be fully explained by the South exporting primary products. If it were, the gap in income between the South and North would fall in accordance with the share of primary exports.

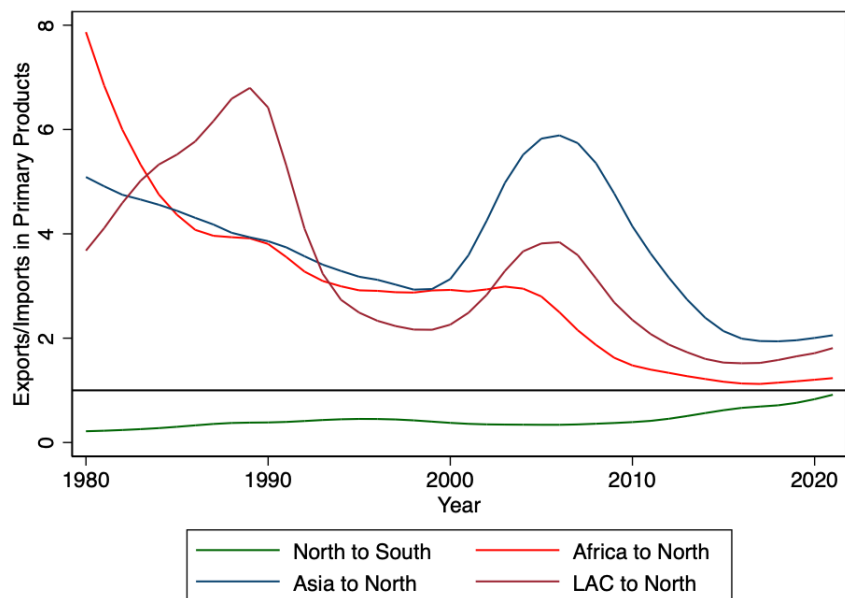


Figure 3.6: Net primary Export by Direction

Notes: Trade data is from the Atlas of Economic Complexity (Atlas, 2022). The data was filtered using Hodrik-Prescott. Figure shows the evolution in the share of primary exports from each specific region going from the South to the North and vice-a-versa.

Next, we illustrate the transformation of the informal economy in Figure (3.7) for 1990-2019. The informal economy is measured using the estimated share of informal output to total output. To no surprise, the North has the most minor informal sector. LAC and Africa had an informal sector share of around 35% in 2019. They have seen some decline since 1990 but have yet to make significant strides to close their difference with the North. However, on average, Asia has had a notable decline in the informal sector, and its share is only 3% greater than the North in 2019.

In all the figures, Asia has been the best-performing region of the South. They have the highest average incomes, most export diversification, and the smallest informal sector. In terms of export

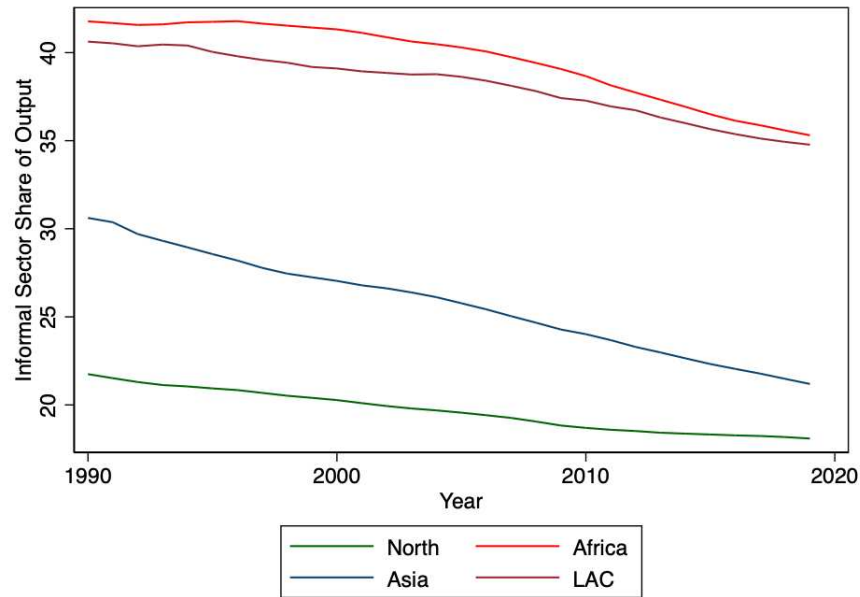


Figure 3.7: Size of the Informal Economy

Notes: Informal economy is from the World Bank Informal Economy Database (Elgin et. al., 2021). We use the dynamic general equilibrium model-based estimates of informal output. Figure shows the evolution of the informal economy share of output for each respective region.

diversification, the South as a whole has been improving and catching up to the level of diversification of the North. However, except for Asia, we have yet to observe a close in the gaps of income and the informal economy's size. If we only look at 1990-2021, Asia's growth rates are nearly 1% higher than the North. All the variables, exports, income, and informal sector, are undoubtedly endogenous, so reaching firm conclusions is challenging. The purpose of this section was to establish some stylized facts regarding the North and the South. The South has decreased its primary exports over time, but this has yet to translate into convergence. Asia, the only southern region with a significant decrease in the informal sector, has also been converging in incomes with the North since 1980.

3.5 Elasticity Ratios

I test the relationship between the informal economy and elasticity ratios to further explore the veracity of the model. I analyze the relationship between income growth, the informal economy, composition of exports, and elasticity ratios for 34 countries from 1985-2019. The estimation is

modeled following Equations (3.20-3.22), where X_{it} and M_{it} are the total value exports and imports for each country, i , in year t . $worldGDP_t$ and GDP_{it} are constant GDPs in year t , where the former is the average of the world and the latter is the GDP of country i . RER is the real exchange rate, estimated using the Penn World Tables.⁵⁹ I then compute elasticity ratios by dividing income elasticity of demand for exports by imports, $ratio = \beta_1/\alpha_1$. This variable is used as the dependent variable in Equation (3.22), where I estimate determinants of elasticity ratios. *Avg. inf growth* is the average growth in the share of total output produced by the informal sector for 1990-2019. *Avg. primary X growth* is the average growth in the share of primary exports for 1985-2019. These two variables highlight the difference between Thirlwall's Law and Lewis' explanation of uneven development. Thirlwall's Law explains that primary products have a lower export elasticity of demand, while Lewis argues that a larger informal sector is detrimental to development. I also include a set of controls, \mathbf{X}' , which are average agricultural productivity growth for 1985-2019, avg growth in gross capital formation for 1985-2019, and average employment rate for 1985-2019.⁶⁰

$$\ln X_{it} = \beta_0 + \beta_1 \ln worldGDP_t + \beta_2 \ln RER_{it} + \epsilon_{it} \quad (3.20)$$

$$\ln M_{it} = \alpha_0 + \alpha_1 \ln GDP_{it} + \alpha_2 \ln RER_{it} + \epsilon_{it} \quad (3.21)$$

$$\frac{\beta_1}{\alpha_1} = \lambda_0 + \lambda_1 avg. inf growth_i + \lambda_2 avg. primary X growth_i + \mathbf{X}'_i \phi + \epsilon_i \quad (3.22)$$

However, the models of Equations (3.20) and (3.21) are inappropriate for estimating long-run and short-run elasticities because of stationarity concerns. So, I estimate elasticity ratios for the 34

⁵⁹ $RER = xr(\text{export price}/\text{import price})$

⁶⁰ Trade data is from the Atlas of Economic Complexity (Atlas, 2022). Data on GDP is from the World Bank World Development Indicators (World Bank, 2023). Informal economy is from the World Bank Informal Economy Database (Elgin et. al., 2021). Agricultural productivity data is from the World Bank Development Indicators. Gross capital formation and employment data are from the Penn World Tables.

countries using an error-corrected autoregressive distributed dynamic panel specification (ARDL-ECM) (Pesaran and Smith, 1995; Pesaran, Shin, and Smith, 2001; Pesaran and Shin, 1999; Kripfganz, 2023).⁶¹ ARDL is a common model specification used by economists to estimate elasticity ratios.⁶² I convert the ARDL into an error correction model. The advantage of this approach is it allows me to estimate short-run and long-run effects of the variables in question. It is well-specified as long as variables follow an I(0) or I(1) process. The models are shown in Equations (3.23) and (3.24).

$$\begin{aligned} \Delta \ln X_{ist} = & \phi_0 + \sum_{j=1}^P \phi_{1j} \Delta \ln X_{ist-j} + \sum_{j=1}^P \phi_{2j} \Delta \ln worldGDP_{ist-j} + \sum_{j=1}^P \phi_{3j} \Delta \ln RER_{ist-j} \\ & + \phi_4 \ln X_{ist-1} + \phi_5 \ln worldGDP_{ist-1} + \phi_6 \ln RER_{ist-1} + \epsilon_{it} \end{aligned} \quad (3.23)$$

$$\begin{aligned} \Delta \ln M_{ist} = & \lambda_0 + \sum_{j=1}^P \lambda_{1j} \Delta \ln M_{ist-j} + \sum_{j=1}^P \lambda_{2j} \Delta \ln GDP_{ist-j} + \sum_{j=1}^P \lambda_{3j} \Delta \ln RER_{ist-j} \\ & + \lambda_4 \ln M_{ist-1} + \lambda_5 \ln GDP_{ist-1} + \lambda_6 \ln RER_{ist-1} + \epsilon_{it} \end{aligned} \quad (3.24)$$

To examine the validity of the ARDL ECM, I first assess the stationarity properties of the variables with the Augmented Dickey-Fuller (ADF) unit root tests. The results are shown in Table (B.2) of the appendix and confirms the validity of our model since all variables follow an I(0) or I(1) process.⁶³ The results for Equations (3.23) and (3.24) are also in the appendix in Table (B.3).

⁶¹Countries from the North: Australia, Cyprus, Japan, the Netherlands, New Zealand, Portugal, Sweden, Switzerland. From the South: the Bahamas, Bangladesh, Cameroon, Chad, China, Comoros, Congo, Ecuador, Jordan, Madagascar, Morocco, Mozambique, Nicaragua, Peru, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Suriname, Tunisia, Uganda, Uruguay, Vietnam, Zambia.

⁶²For example, Bölükbaşı and Civrir (2024); Gregori and Giansoldati (2020).

⁶³Also in the appendix are the summary statistics for Equations (3.23) and (3.24) in Table (B.4) and for the second estimation where I find determinants for the elasticity ratio in Table (B.5).

First I assess the relationship between elasticity ratios and various variables of interest. The top-left panel of Figure (3.8) shows that average income growth rates from 1985-2019 are positively correlated with the estimated elasticity ratio for this same period.

The top-right panel of Figure (3.8) shows that elasticity ratios are negatively associated with a growth in the share of informal sector output. Countries in the South that are growing are likely to experience a fall in their share of informal output, so this result is not surprising. However, the important point from Figure (3.8) is that elasticity ratios are related to growth, and not levels of income, as many low-income countries in the South have high elasticity ratios. Therefore, it is vital variable for growth as argued by [Krugman \(1989\)](#) and [Thirlwall \(1979\)](#). Finally, the bottom panel of Figure (3.8) shows that there is not an association with elasticity ratios and average primary exports, in neither growth nor levels.

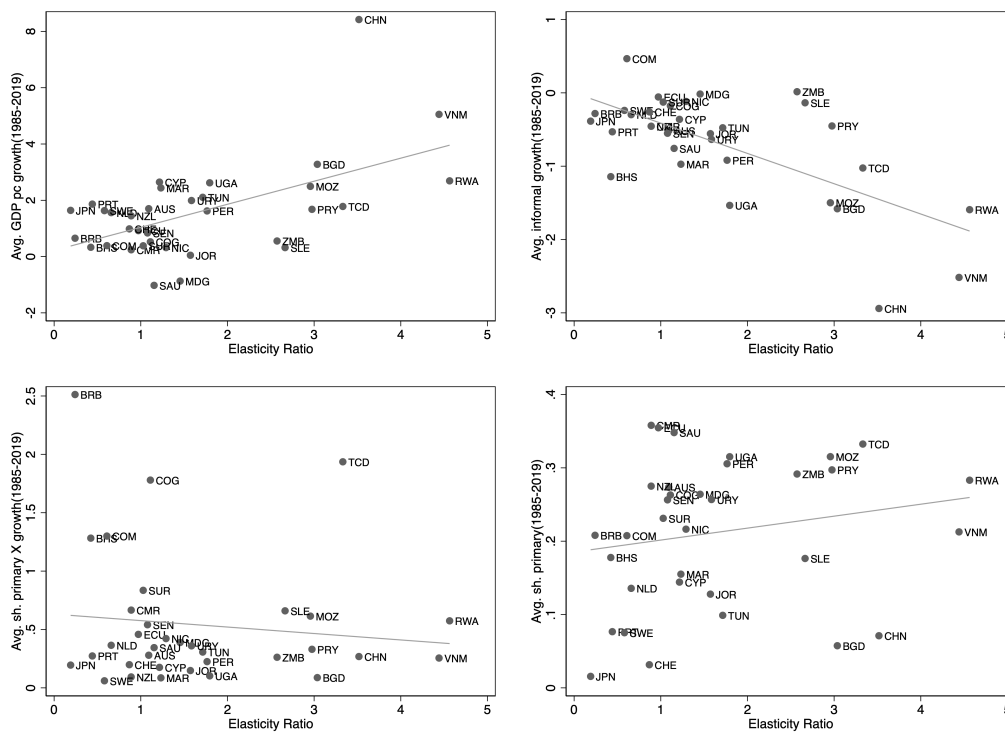


Figure 3.8: Elasticity Ratio Correlations

Notes: For each panel the x-axis is elasticity ratios for 1985-2019. The y axis for top-left is the average GDP growth for the period, top-right is average growth in the share of informal sector output, bottom left is average growth in the share of primary exports, and the bottom right is the average share of primary exports. Trade data is from the Atlas of Economic Complexity ([Atlas, 2022](#)). Data on GDP is from the World Bank World Development Indicators ([World Bank, 2023](#)). Informal economy is from the World Bank Informal Economy Database ([Elgin et. al., 2021](#)).

Table (3.1) shows the results of Equation (3.22). The relationship between elasticity ratios and the informal sector is statistically significant and negative in all four specifications. This estimation does not control for the variety of factors that might affect elasticity ratios, so the results are imperfect. However, the argument for the importance of raising internal productivity to reduce the informal sector, can not be ruled out. Low internal productivity is related to the elasticity ratio because it decreases the range of outputs and increases dependency on imports. The amount of production of the country will be limited because of low productivity workers in the informal sector. These workers are ‘trapped’ in the sense that labor can not be mobilized appropriately when foreign demand picks up. Therefore, the limited domestic market also hinders the growth of exporting sectors. It harms the ability of the country to respond to foreign demand, especially if there are new tastes and preferences from trading partners, because labor is stuck in informality.

Also, the lack of domestic demand means the exporting sectors are solely reliant on demand from elsewhere which causes volatility in the business cycles of these countries and prevents expansion. Lewis (1980, p. 562) states, “If a sufficient number of LDCs [Less Developed Countries] reach self-sustaining growth, we are into a new world. For this will mean that instead of trade determining the rate of growth of LDC production, it will be the growth of LDC production that determines LDC trade, and internal forces that will determine the rate of growth of production.” For these reasons, low internal productivity decreases income elasticity of exports.

Next, low internal productivity increases the income elasticity of imports because it causes import dependency. The range of domestic production will be less than the range of domestic demand due to a limited local market. To fill this shortage, individuals will look to consume products from other countries. If incomes grow without internal productivity growing, than the import share of consumption will rise. The two effects on elasticities make low internal productivity harmful for the elasticity ratio.

This situation highlights the issue of disconnected export and domestic sectors. A rise in export demand should loosen constraints to the balance-of-payments, but if not accompanied by an increase in domestic productivity it might do the opposite. For example, in this case it would be

Table 3.1: Regressions of elasticity ratios

	Dependent variable is elasticity ratio (1985-2019)			
	(1)	(2)	(3)	(4)
avg. informal sector growth	-1.085*** (0.206)	-1.083*** (0.313)	-0.888*** (0.247)	-0.770** (0.286)
avg. sh primary export growth			-0.251 (0.211)	-0.403** (0.188)
avg. ag productivity growth			0.223** (0.105)	0.255** (0.0945)
avg. gross capital formation growth			13.49** (4.997)	8.184 (4.778)
avg employment rate			-0.00127 (0.000884)	-0.00145 (0.00109)
regional fixed effects		X		X
Constant	0.908*** (0.188)	0.464*** (0.162)	0.733*** (0.206)	0.435* (0.236)
Observations	34	34	34	34
R-squared	0.448	0.584	0.671	0.750

Notes: Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1. The table reports OLS results for Equation (3.22). The Dependent variable, elasticity ratio is income elasticity of exports divided income elasticity of imports. The elasticities are estimated for 1985-2019 with Equations (3.23) and (3.24). All of the independent variables are averages from this time period.

expected that income elasticity of exports rise, but will be limited because of the workers ‘trapped’ in informality. Also, the improvement will likely be temporary as the increase in demand will eventually reverse. Modern workers in the South will use their extra income to demand more products from the North. The problem is only made worse if export production is concentrated in a few industries. Then, a probable result is a rise in income elasticity of imports. An integrated domestic and export sectors is when each are purchased locally for either consumption or as intermediate goods for the other sector. Under these circumstances, then a rise in export demand can help the domestic sector through spillover effects and not lead to deterioration of elasticity ratios. [Nurkse \(1971, p. 126\)](#) states: “Balanced growth, as a means of enlarging the market and stimulating the incentives for higher productivity through capital investment, is an essential basis for expanding trade.”

3.6 Conclusion

In the *Janeway Lectures* (Lewis, 1978), Arthur Lewis predicted the South would become net importers of primary products over time and continuously increase their exports of manufactured goods. The reason is the shortage of unskilled manufactured laborers in the North. To combat this, the North will invest capital in poorer nations to produce low-wage manufacturers for import. We have shown in Section (3.4) that Lewis's prediction is trending to be correct, but this has not solved the problem of uneven development. Once divided among primary and manufactured exporters, the world order will be transformed. "The ending of this division exposes the fallacy of the belief that the division [between North and South] was based on unfavorable terms of trade for agriculture as against industry. If 60 percent of the tropical labor force is in low-productivity food, the rest of the labor force will get low prices whether it exports agricultural or industrial products" (Lewis, 1978, p. 36).

The model developed in this article assumes no differences in the products exported between the North and South. Even so, uneven development is the long-term outcome. The North attains higher growth since their internal production is done in modernity. Furthermore, a large informal sector harms the South. They become dependent on imports from the North and are not equipped to respond to increased foreign demand for their products. Elasticity ratios move unfavorably for the South and terms-of-trade deteriorate in the long run. These factors force BP equilibrium to become constrained and uneven development to occur.

The South needs to raise domestic productivity to close the income gap between the two regions. In doing so, wages and prices for exported products will rise, and workers will be released from the informal sector so that the domestic market will grow, leading to less import dependency. Thus, the constraint due to BP equilibrium will be looser, and catching up to the North will be possible. Increasing internal productivity involves strategic action by economic agents and the state. The first step is to target the areas of concern. That is, the location of the informal economy and internal production. A large portion will likely be in the rural areas, but there will also be street vendors and such in urban regions. The next step involves implementing extension and learning

programs in these areas of concern. For example, upgrading tools and techniques of production, and updating transportation routes and methods so the products can more easily reach the consumer. The line between informality and formality is blurred, and for our purposes, it is irrelevant. What matters is increasing the productivity of the domestic economy, regardless of whether that means transforming the informal sector into a modern one or not.

The expansion of Northern investment to the South has not solved uneven development as it does not enhance the internal economy of the South. In some instances, it might worsen uneven development by diverting attention away from the internal economy. Many of the exporting sectors of Southern countries are set up through these investments and become enclaves with no ties to the domestic economy, such as the Caribbean tourism industry. They make products solely for foreign consumption, and much of the money spent by foreigners does not find its way back into the economy. Integrating the domestic and export sectors is another step to overcoming uneven development for the South. More empirical work is needed to confirm the arguments outlined in this article. Also, I have not analyzed the distributional effects from elasticity ratio movements. An useful extension could do just that and connect the distributional changes with different demand-led regimes. Lastly, an interesting extension to the current model is to formally include the effects of outsourcing and tourism.

Bibliography

- Abad, L. A., & Maurer, N. 2021. "History never really says goodbye: a critical review of the persistence literature." *Journal of Historical Political Economy*, 1(1), 31-68.
- Acemoglu, D., Johnson, S., & Robinson, J. A. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American economic review*, 91 (5), 1369-1401.
- Acemoglu, D., Johnson, S., & Robinson, J. A. 2002. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution." *The Quarterly journal of economics*, 117 (4), 1231-1294.
- Acemoglu, D., Johnson, S., Robinson, J. A. 2005. "Institutions as a Fundamental Cause of Long-Run Growth." In *Handbook of Economic Growth*, Volume 1a, ed. Philippe Aghion and Steven N. Durlauf, 385–472. Amsterdam and San Diego: Elsevier, North-Holland
- Acemoglu, D., García-Jimeno, C., & Robinson, J. A. 2012. "Finding Eldorado: Slavery and long-run development in Colombia." *Journal of Comparative Economics*, 40(4), 534-564.
- Alacevich, M., & Asso, P.F. 2009. "Money Doctoring after World War II: Arthur I. Bloomfield and the Federal Reserve Missions to South Korea." *History of Political Economy*, 41 (2): 249-270.
- Althoff, L., & Reichardt, H. 2024. "Jim Crow and Black economic progress after slavery." *The Quarterly Journal of Economics*, 139(4), 2279-2330.
- Archibald, C. 1962. "The Failure of the West Indies Federation." *The World Today*, 18 (6): 233–42.
- Asso, P.F. & Fiorito, L. 2013. "Studying Institutional Economics at Chicago in the 1930s: The case of Arthur Bloomfield." In *Documents related to John Maynard Keynes, institutionalism at Chicago & Frank H. Knight*, 57-77. Emerald Group Publishing Limited.
- Atlas for Economic Complexity. 2022. *Growth Lab, Center for International Development at Harvard University*.
- Beauvois, F. 2016. *Between blood and gold: the debates over compensation for slavery in the Americas (Vol. 10)*. Berghahn Books.

- Beckford, G. L. 1999. *Persistent Poverty: Underdevelopment in Plantation Economies of the Third World*. University of the West Indies Press.
- Best, L. & McIntyre, A. 1961. "A First Appraisal of Monetary Management in Jamaica." *Social and Economic Studies*, 10 (3): 353-363.
- Best, L., & Polanyi-Levitt, K. 2009. *Essays on the Theory of Plantation Economy: A Historical and Institutional Approach to Caribbean Economic Development*. Kingston: University of the West Indies Press.
- Bellhorn, M. M. 1992. "A Comparative Approach to Slave Life on Bermuda, 1780-1834." *Dissertations, Theses, and Masters Projects. William & Mary. Paper 1539625720*.
- Blecker, R. A. 2022. "New advances and controversies in the framework of balance-of-payments-constrained growth." *Journal of Economic Surveys*, 36 (2), 429-467.
- Blériot, L. 2000. "The law of compensation for settlers of April 30, 1849: legal aspects." *Historical review of the Mascarenes* , (02), 147-161.
- Bloomfield, A.I. 1950. "Capital Imports and the American Balance of Payments, 1934– 1939." Chicago: University of Chicago Press.
- Bloomfield, A.I. 1956. "Monetary Policy in Underdeveloped Countries." In *Public Policy. A Yearbook of the Graduate School of Public Administration*, edited by Carl J. Friedrich and Seymour E. Harris, vol. 7, 232–74. Cambridge: Harvard University Press.
- Bloomfield, A.I. 1957. "Some Problems of Central Banking in Underdeveloped Countries." *Journal of Finance*, 12 (2):190–204.
- Bloomfield, A.I. 1961. "Central Banking Arrangements for the West Indian Federation." *Federal Studies*, No. 2., box 6, folder "Assignments in the British West Indies and Colonial Monetary Systems, 1960-1961," Arthur Bloomfield Papers, David M. Rubenstein Rare Book & Manuscript Library, Duke University.
- Bloomfield, A.I. 1992. "On the Centenary of Jacob Viner's Birth. A Retrospective View of the Man and his Work." *Journal of Economic Literature*, 30 (4): 2052–85.

- Bloomfield, A.I. 1994. "Essays in the history of international trade theory." Cheltenham, UK: Edward Elgar.
- Bloomfield, A.I. & Jensen, J.P. 1951. "Banking Reform in South Korea." New York: Federal Reserve Bank of New York.
- Bolland, O. N. 1981. "Systems of Domination after Slavery: the Control of Land and Labor in the British West Indies after 1838." *Comparative Studies in Society and History*, 23 (4), 591-619.
- Bollen, K. A., and R. W. Jackman. 1990. "Regression diagnostics: An expository treatment of outliers and influential cases." In *Modern Methods of Data Analysis*, ed. J. Fox and J. S. Long, 257–291. Newbury Park, CA: Sage.
- Boyd, Robert, and Peter J. Richerson. 1985. *Culture and the Evolutionary Process*. Chicago: University of Chicago Press.
- Boyd, Robert, and Peter J. Richerson. 2005. *The Origin and Evolution of Cultures*. New York: Oxford University Press.
- Bölükbaşı, H., & Civcir, I. 2024. "Imported Inputs, Balance of Payments and Economic Growth: a model and a test on the case of Turkey." *Structural Change and Economic Dynamics*, 70, 319-332.
- Bruhn, M. and F. A. Gallego. 2012. "Good, Bad, and ugly Colonial Activities: Do They Matter for Economic Development?" *Review of Economics and Statistics* 94(2): 433–61.
- Butler, K. M. 1995. *The economics of emancipation: Jamaica & Barbados, 1823-1843*. UNC Press Books.
- Carvalho, J. P., & Dippel, C. 2020. "Elite identity and political accountability: A tale of ten islands." *The Economic Journal*, 130(631), 1995-2029.
- Chichilnisky, G. 1993. "North-South trade and the dynamics of renewable resources." *Structural Change and Economic Dynamics*, 4 (2), 219-248.
- CIA Government. 2024. "Country Comparisons- Area." *World Factbook*.
- Clark, G. 2024. "What were the British Earnings and Prices Then?" *MeasuringWorth*.

- Constant, F. 1998. "French republicanism under challenge: white minority (béké) power in Martinique and Guadeloupe." in *The White Minority in the Caribbean*, editors H. Johnson and K. Watson, pp. 168-79. Princeton, NJ: Wiener Publishers/Kingston: Ian Randle Publishers.
- Craig, A. K. 1969. "Logwood as a Factor in the Settlement of British Honduras." *Caribbean Studies*, 9 (1), 53-62.
- Darity Jr, W. 1982. "On the long-run outcome of the Lewis-Nurkse international growth process." *Journal of Development Economics*, 10 (3), 271-278.
- Darity Jr, W., & Davis, L. S. 2005. "Growth, trade and uneven development." *Cambridge Journal of Economics*, 29 (1), 141-170.
- Dasgupta, P., & Stiglitz, J. 1988. "Learning-by-doing, market structure and industrial and trade policies." *Oxford Economic Papers*, 40 (2), 246-268.
- Dell, M. 2010. "The Persistent Effects of Peru's Mining Mita. *Econometrica*, 78(6), 1863-1903.
- Draper, N. 2010. *The Price of Emancipation: Slave-Ownership, Compensation, and British Society at the End of Slavery*. Cambridge: Cambridge University Press.
- Dutt, A. K. 2002. "Thirlwall's law and uneven development." *Journal of Post Keynesian Economics*, 24 (3), 367-390.
- Edvinsson, R. 2016. Historical Currency Converter.
- Edvinsson, R., Jacobson, T., & Waldenström, D. 2010. *Exchange rates, prices, and wages, 1277-2008*. Ekerlids förlag.
- Eichengreen, B.J. 1994. "House Calls of the Money Doctor: The Kemmerer Missions to Latin America, 1917–1931." In *Money Doctors, Foreign Debts, and Economic Reforms in Latin America from the 1980s to the Present*, edited by P. W. Drake. Wilmington, Del.: Scholarly Resources.
- Elgin, C., M. A. Kose, F. Ohnsorge, and S. Yu. 2021. "Understanding Informality." CERP Discussion Paper 16497, *Centre for Economic Policy Research*, London.
- Engerman, S. L. 1982. "Economic Adjustments to Emancipation in the United States and British West Indies." *The Journal of Interdisciplinary History*, 13 (2), 191-220.

- Engerman, S. L. 1984. "Economic Change and Contract Labour in the British Caribbean: The End of Slavery and the Adjustment to Emancipation." *Explorations in Economic History*, 21, 133-150.
- Engerman, S. L., & Higman, B. W. 2003. "The demographic structure of the Caribbean slave societies in the eighteenth and nineteenth centuries." In *General History of the Caribbean*, 3, 45-104. Palgrave Macmillan US.
- Engerman, S. L., & Sokoloff, K. L. 1997. "Factor Endowments: Institutions, and Differential Paths of Growth Among New World Economies: a View from Economic Historians of the United States." in Stephen Harber, ed., *How Latin America Fell Behind* (Stanford University Press, Stanford), 260–304.
- Engerman, S. L., & Sokoloff, K. L. 2002. "Factor Endowments, Inequality, and Paths of Development Among New World Economies." Working Paper 9259, *National Bureau of Economic Research*.
- Ernatus, C. 2009. "L'indemnité coloniale de 1849, logique de solidarité ou logique coloniale?". *Bulletin de la Société d'Histoire de la Guadeloupe*, (152), 61-77.
- Faber, M. 1964. "A "Swing" Analysis of the Jamaican Election of 1962: A Note." *Social and Economic Studies*, 13 (2): 302–10.
- Feenstra, Robert C., Robert Inklaar & Marcel P. Timmer. 2015. "The Next Generation of the Penn World Table" *American Economic Review*, 105(10), 3150-3182,
- Fatah-Black, K., Lauret, L., & van den Tol, J. 2023. "Serving the chain?: De Nederlandsche Bank and the last decades of slavery, 1814-1863." Leiden University Press.
- Findlay, R. 1980. "The Terms of Trade and Equilibrium Growth in the World Economy." *The American Economic Review*, 70 (3), 291-299.
- French Republic. 1849. Bulletin des lois de la République française. <https://gallica.bnf.fr/ark:/12148/bpt6k486123h/f428.item> and <https://gallica.bnf.fr/ark:/12148/bpt6k5512591n/f409.item>

- Gomez-Betancourt, R. 2022. "The Political Economy of a Modern Missionary: E. W. Kemmerer in the Philippines." *History of Political Economy*, 54 (3): 483–505.
- Green, W. A. 1991. *British Slave Emancipation: The Sugar Colonies and the Great Experiment, 1830-1865*. Oxford University Press.
- Gregori, T., & Giansoldati, M. 2020. "Import demand in heterogeneous panel data with cross-sectional dependence." *Applied Economics*, 52(5), 443-458.
- Grytten, O. H. 2003. "Consumer price indices for the Scandinavian countries 1815-1913." *Norwegian Open Research Archives*.
- Helleiner, E. 2003. "The Southern Side of 'Embedded Liberalism': America's Unorthodox Money Doctoring during the Early Post-1945 Years." In *Money Doctors: The Experience of International Financial Advising, 1850–2000*, edited by Marc Flandreau, 249–75. London: Routledge.
- Higman, B. W. 1995. *Slave Populations of the British Caribbean, 1807-1834*. University of the West Indies Press.
- House of Commons 1838. *Accounts of Slave Compensation Claims*.
- International Comparison Program. 2021. Washington, D.C. : The World Bank.
- International Labour Organization. 2024. *Informal Economy and Atypical Forms of Employment*.
- Irwin, D. 2016. "Friedman and Viner." In *Milton Friedman: Contributions to Economics and Public Policy*, edited by Robert A. Cord and J. Daniel Hammond, 757–73. Oxford: Oxford University Press.
- Iyer, L. 2010. "Direct versus Indirect Colonial Rule in India: Long-term Consequences." *The Review of Economics and Statistics*, 92 (4), 693-713.
- Jarvis, M. J. 2002. "Maritime Masters and Seafaring Slaves in Bermuda, 1680-1783." *The William and Mary Quarterly*, 59 (3), 585-622.
- Kaldor, N. 1978. *Further essays on economic theory*. (No Title).
- Kaufmann, D. & Kraay, A. 2023. *Worldwide Governance Indicators*.
- Killingray, D. 2000. "The West Indian Federation and Decolonization in the British Caribbean." *The Journal of Caribbean History*, 34 (1): 71.

- Kováts Beaudoux, É. 2002. *Les blancs créoles de la Martinique: une minorité dominante*. Paris: L'Harmattan.
- Knight, F. W. 2003. *The disintegration of the Caribbean slave systems, 1772–1886*. Palgrave Macmillan US.
- Kripfganz, S., & Schneider, D. C. 2023. "ardl: Estimating autoregressive distributed lag and equilibrium correction models." *The Stata Journal*, 23(4), 983-1019.
- Krugman, P. 1981. "Trade, accumulation, and uneven development." *Journal of Development Economics*, 8 (2), 149-161.
- Krugman, P. 1989. "Differences in income elasticities and trends in real exchange rates." *European Economic Review*, 33 (5), 1031-1046.
- Krugman, P. 1994. "Does third world growth hurt first world prosperity?." *Harvard Business Review*, 72 (4), 113-121.
- Lamur, H. E. 1981. "Demographic Performance of Two Populations of the Dutch Speaking Caribbean." *Boletín de Estudios Latinoamericanos y Del Caribe*, 30, 87–102.
- Lamur, H. E. 1996. "The Natural Decrease of the Coastal Guiana Slave Societies in the Nineteenth Century." *Journal of Social Sciences-University of Suriname*, 3.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. 1999. "The Quality of Government. Journal of Law," *Economics, and organization*, 15(1), 222-279.
- Lewis, W. A. 1954. "Economic Development with Unlimited Supplies of Labour." *The Manchester School*, 22 (2), 139-191.
- Lewis, W. A. 1965. *The Agony of the Eight*. Advocate Commercial Printery.
- Lewis, W. A. 1978. *The Evolution of the International Economic Order*. Princeton, NJ: Princeton U. Press.
- Lewis, W. A. 1980. "The Slowing Down of the Engine of Growth." *The American Economic Review*, 70 (4), 555-564.
- Maes, I. & Pasotti, I. 2021. *Robert Triffin: A Life*. Oxford: Oxford University Press.

- Matsuyama, K. 1992. "Agricultural Productivity, Comparative Advantage, and Economic Growth." *Journal of economic theory*, 58(2), 317-334.
- Mordecai, J. 1968. *The West Indies: The Federal Negotiations*. London: George Allen and Unwin.
- The National Institute of Statistics and Economic Studies. 2024. "Gross domestic products."
- Nerozzi, S. 2011. "From the Great Depression to Bretton Woods: Jacob Viner and International Monetary Stabilization (1930–1945)." *European Journal of the History of Economic Thought* 18 (1): 55–84.
- Nguyen, T. Q., I. Schmid, E. L. Ogburn, and E. A. Stuart. 2022. "Clarifying causal mediation analysis: Effect identification via three assumptions and five potential outcomes." *Journal of Causal Inference* 10: 246–279.
- North, D.C. 1990. *Institutions, Institutional change, and Economic Performance*, Cambridge University Press, New York.
- Numa, G. 2018. Colonial heritages and continuities in Guadeloupe and Martinique. in S. Chauvin, P. Clegg, & B. Cousin, *Euro-Caribbean Societies in the 21st Century. Offshore finance, local élites and contentious politics*. pp. 101-113. Oxon, New York: Routledge.
- Nunn, N. 2007. "Slavery, Inequality, and Economic Development in the Americas: An Examination of the Engerman-Sokoloff Hypothesis," in *E. Helpman, Institutions and Economic Performance*. Cambridge: Harvard University Press; 2008. pp. 148-180.
- Nunn, N. 2008. "The Long-term Effects of Africa's Slave Trades." *The Quarterly Journal of Economics*, 123 (1), 139-176.
- Nunn, N. 2020. "The Historical Roots of Economic Development." *Science*, 367(6485).
- Nunn, N., & Wantchekon, L. 2011. "The Slave Trade and the Origins of Mistrust in Africa." *American economic review*, 101 (7), 3221-3252.
- Nurkse, R. 1971. "The Theory of Development and the Idea of Balanced Growth." In *Developing the underdeveloped countries* (pp. 115-128). London: Palgrave Macmillan UK.
- Officer, L. 2024. "Exchange Rates Between the United States Dollar and Forty-one Currencies." *MeasuringWorth*.

- Officer, L. & Williamson, S. 2024. "The Annual Consumer Price Index for the United States, 1774-Present." *MeasuringWorth*.
- "Federation: The Demise of an Idea." *Social and Economic Studies*, 48 (4): 21–63.
- Pesaran, M. H., and Y. Shin. 1999. "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis." In *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*, edited by S. Strom and P Diamond, 371-413. Cambridge: Cambridge University Press.
- Pesaran, M. H., Shin, Y., & Smith, R. J. 2001. "Bounds testing approaches to the analysis of level relationships." *Journal of applied econometrics*, 16(3), 289-326.
- Pesaran, M. H., and R. P. Smith. 1995. "Estimating Long-run Relationships from Dynamic Heterogeneous Panels." *Journal of Econometrics* 68 (1): 79–113.
- Piketty, T., & Zucman, G. 2014. "Capital is back: Wealth-income ratios in rich countries 1700–2010." *The Quarterly journal of economics*, 129(3), 1255-1310.
- Porter, C., Meheut, C., Gebrekidan, H., and Apuzzo, M. 2022. "Haiti's Lost Billions." *New York Times*.
- Porter, C., Meheut, C., Gebrekidan, H., and Apuzzo, M. 2022. "The Ransom: A Look Under the Hood." *New York Times*.
- Prados-de-la-Escosura, L. 2024. "What was Spain's GDP then?" *MeasuringWorth*.
- Prebisch, R. 1962. "The economic development of Latin America and its principal problems." *Economic Bulletin for Latin America*.
- Reid, S. 1977. "An introductory approach to the concentration of power in the Jamaican corporate economy and notes on its origin." in *Essays on power and change in Jamaica* pp. 15-44, editors C. Stone and K. Brown. Jamaica Publishing House.
- Reid, S. 1980. "Economic Elites in Jamaica: A Study of Monistic Relationship." *Anthropologica*, 25-44.
- Sasaki, H. 2008-9. "North-South Ricardian Trade and Growth Under the Balance of Payments Constraint," *Journal of Post Keynesian Economics*, Winter.

- Sasaki, H. 2021. "Thirlwall's Law, Uneven Development, and Income Distribution." *Metroeconomica*, 72 (3), 592-611.
- Seers, D. 1957. "Federation of the British West Indies: The Economic and Financial Aspects." *Social and Economic Studies*, 6 (2): 197–214.
- Singer, H. W. 1950. "The Distribution of Gains Between Investing and Borrowing Countries." In *Milestones and Turning Points in Development Thinking* (pp. 265-277). London: Palgrave Macmillan UK.
- Slave Voyages. 2024. Intra-American Slave Trade Database. Retrieved December 24, 2024, from <https://www.slavevoyages.org/american/database>
- Smits, J. P., Horlings, E., & Van Zanden, J. L. 2000. *Dutch GNP and its components, 1800-1913*. Groningen Growth and Development Centre.
- Spinola, D. 2020. "Uneven development and the Balance of Payments Constrained Model: Terms of Trade, Economic Cycles, and Productivity Catching-up." *Structural change and economic dynamics*, 54, 220-232.
- StatBank Denmark. 2024. *Consumer price index, annual average (1900=100)*.
- Statistics Netherlands. 2024. "Consumer prices; price index" *Official Statistics of the Netherlands*.
- Statistics Netherlands. 2024. "Caribbean Netherlands; gross domestic product (GDP) per capita" *Official Statistics of the Netherlands*.
- Statistics Sweden. 2024. "CPI, Historical numbers, 1830–" *Official Statistics of Sweden*.
- Stock, J. H., & Yogo, M. 2005. "Testing for weak instruments in linear IV regression." In D. W. K. Andrews & J. H. Stock (Eds.), *Identification and inference for econometric models: Essays in honor of Thomas Rothenberg*, pp. 80–108. Cambridge University Press.
- Taylor, L. 1981. "South-North Trade and Southern Growth : Bleak Prospects from a Structuralist Point of View." *Journal of International Economics*, November.
- Thirlwall, A. P. 1979. "The Balance of Payments Constraint as an Explanation of International Growth Rate Differences." *BNL Quarterly Review*, 32 (128), 45-53.

- Thirlwall, A. P. 2012. "Balance of Payments Constrained Growth Models: History and Overview." *Models of balance of payments constrained growth: History, theory and empirical evidence*, 11-49.
- Triffin, R. 1946. "National Central banking and the International Economy." *Review of Economic Studies* 14 (2): 53–75.
- United Nations, Department of Economic and Social Affairs, Population Division. 2024. *World Population Prospects 2024*, Online Edition.
- United Nations. 2024. "List of Former Trusts and Non-Self-Governing Territories". *The United Nations and Decolonization*.
- United Nations. 2024. "Non-Self-Governing Territories". *The United Nations and Decolonization*.
- Urquidi, V.L. 1991. "Monetary Management in Latin America." In *Evolution of the International and Regional Monetary Systems*, edited by A. Steinherr and D. Weiserbs, 160–169. London: Macmillan.
- U.S. State Department. 2024. *Independent States and Dependencies*
- U.S. State Department. 2024. *Independent States and Dependencies*
- Vincenty, T. 1975. "Direct and inverse solutions of geodesics on the ellipsoid with application of nested equations." *Survey review*, 23(176), 88-93.
- Viner, J. 1962. "The Necessary and the Desirable Range of Discretion to Be Allowed to a Monetary Authority." In *In Search of a Monetary Constitution*, edited by Leland B. Yeager, 244–274. Cambridge: Harvard University Press
- Virgin Island History. n.d. "The end of slavery – Compensation to the slave owners." <https://www.virgin-islands-history.org/en/history/ownership-history/the-end-of-slavery-compensation-to-the-slave-owners/>
- Vera, L.A. 2006. "The Balance of Payments Constrained Growth Model : A North-South Approach." *Journal of Post Keynesian Economics*, Fall.
- Vogt, E. A. 2005. *Ghosts of the plantation: Historical representations and cultural difference among Martinique's white elite*. PhD dissertation, Anthropology Department, University of

Chicago.

Wallace, E. 1961. "The West Indies: Improbable Federation?" *Canadian Journal of Economics and Political Science* 27 (4): 444–459.

Ward, J. R. 1988. "Emancipation and the Planters." *The Journal of Caribbean History*, 22 (1), 116.

Williams, E. 1942. "The British West Indian slave trade after its abolition in 1807." *The Journal of Negro History*, 27(2), 175-191.

Williams, E. 1959. *The Economics of Nationhood*. Port of Spain: PNM Publishing Co.

World Bank. 2023. *World Development Indicators*.

World Bank. 2024. World Development Indicators DataBank, Accessed 8 July 2024.

Appendix A: Chapter 1

A.1 Hurricane Belt



Figure A.1: Atlantic Hurricane Belt

Notes: The figure shows the hurricane belt across the Caribbean and Atlantic Oceans. With the exception of Bermuda, every territory north of St. Lucia is considered within the Hurricane Belt. Figure is from <https://www.thetimes.co.uk/travel/advice/when-is-hurricane-season-in-the-caribbean-0h8xfm6qd>

A.2 Data Sources

Table A.1: Data Sources

Variable	Description	Source
GDP per capita (PPP)	Current GDP per capita purchasing 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 (A.1), 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 insitutional 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 preceding abolition in each territory	British West indies (Higman, 1995), Dutch West Indies (Lamur, 1981), French Guiana (Lamur, 1996).

A.3 Compensation Measures

Each compensation measure is calculated using Table (A.2). 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 parentheses. 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, $comp_{1873i}$, is constructed by multiplying three variables. Compensation in each respective currency, exchange rate in 1873, and ratio of the average 1873 CPI (100) to average abolition year CPI. USA CPI is not shown in the table but it is included in average CPI. $comp_{xri}$ is constructed by multiplying compensation by 1873 exchange rates. $comp_{PPP_i}$ takes the ratio of 2019 CPI (100) 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 (A.2). $comp_{1850i}$ is constructed using the History Currency Database (Edvinsson, 2016). Finally, $comp_{1873newi}$ is the same measurement as $comp_{1873i}$, but I used total average slave compensation for the British West Indies, instead of average employed slave compensation.

A.4 Distance measure

The distance instrument measures the distance in 1000 km to the nearest slave market. The seven slave markets are: New Providence in The Bahamas, Barbados, Bermuda, St. Thomas in the Danish West Indies, Guadeloupe, Kingston in Jamaica, and St. Barthelemy. With the exception of Bermuda, these territories represent the highest proportion of slave exports according to the Intra-Americas Slave Trade Database (Slave Voyages, 2024). Bermuda did not import slaves and since it is far from the nearest market, I include it as a slave market. I use the built-in STATA command *geodist* to calculate distances between two decimal coordinates of latitude and longitude. *geodist* measures the length of the shortest path between two points of a model of earth using Vincenty

Table A.2: Compensation Construction

Territory	Comp per slave	Exchange rate 1873 (abolition)	Avg CPI abolition (1873=100)	CPI abolition (2019=100)	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)	74.17	1.03	0.67	
Guyana	58.5 pounds					
Jamaica	22.9 pounds					
Montserrat	20 pounds					
St. Kitts and Nevis	19.8 pounds					
St. Lucia	29.9 pounds					
St. Vincent and the Gren.	30.6 pounds					
Trinidad and Tobago	43.6 pounds					
Aruba	200 guilders					
Bonaire	200 guilders					
Curacao	200 guilders					
Saba	200 guilders	1 guilder=0.460 USD (0.599 USD)	90.77	3.92	0.767	In 2002, the Netherlands adopted the euro at a rate of 1 euro=2.204 guilders
St. Eustatius	200 guilders					
Sint Maarten	100 guilders					
Suriname	300 guilders					
French Guiana	619.1 francs					
Guadeloupe	469.6 francs	1 franc=0.217 USD (0.191 USD)	74.67	0.03	0.706	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
Martinique	430.2 francs					
Danish West Indies	180 Danish Kroner	1 kroner=0.303 USD (0.275 USD)	74.67	1.28	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	0.144	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)	83.12	1.42	8.584	

Notes: The table shows the construction of the compensation measures used. For example to get the base compensation ($comp_{1873}$) you take Column 2 (comp per slave), which shows the amount of compensation in each respective currency, multiply by 100 over Column 4 (CPI at abolition), and then multiply by the Column 3 (1873 exchange rate for US dollars).

(1975) formula. This formula uses an iterative method and is more accurate than the great-circle distance formula.

Figure (A.2) geographically illustrates the construction of the distance measure. The seven slave markets are the filled in shapes, while the importing territories are the hollow shapes. For most the importing territories, I use the centroid of its area, the exception are for Guyana, Suriname, and French Guiana. The coordinates for these are near the sea, as this is where the populations are concentrated. For Guyana it is Georgetown, Suriname it is Paramaribo, and French Guiana it is Cayenne. Each shape corresponds to trading partners. For example, Kingston in Jamaica is slave market that is marked by a filled in triangle. Belize imported slaves from this market so it is marked by a hollow triangle. Furthermore, I treat slave market territories as their own importers. So, the centroid of Jamaica imports slaves from Kingston (where the filled-in triangle is). Due to its distance to other territories, Bermuda (plus symbol) and New Providence, Bahamas (cross symbol) are treated as their own markets.



Figure A.2: Slave Markets

Notes: Each shape represents one of the 28 territories in this study. The filled-in shapes are the slave markets, and its corresponding hollow shapes are where these respective markets sent their slaves. Kingston, Jamaica (filled-in triangle) sent slaves to Belize (hollow triangle). St. Thomas, The Danish West Indies (filled-in upside down triangle) sent slaves to Puerto Rico, Aruba, Curacao, and Bonaire (hollow upside down triangles). Saint Barthelemew (filled-in square) sent slaves to Sint Maarten, Saba, St. Kitt's and Nevis, St. Eustatius, and Anguilla (hollow squares). Guadeloupe (filled-in diamond) sent slaves to Martinique, Montserrat, Antigua and Barbuda, and Dominica (hollow diamonds). Barbados (filled-in circle) sent slaves to St. Vincent and the Grenadines, Trinidad and Tobago, Paramaribo in Suriname, St. Lucia, Georgetown in Guyana, Cayenne in French Guiana, and Grenada (hollow circles). Each slave market is also treated as its own importer. Thus New Providence, Bahamas (cross symbol) and Bermuda (plus symbol) only traded within their own territory.

A.5 Alternative Compensation Measures

Figure (A.3), uses different measurements of compensation as the dependent variable and estimates the same regression as Column 4 in Table (1.5). xr is the exchange rate to USD for each currency at the time of their abolition. 2019 *PPP* is a measure of compensation based on the average price growth from abolition to today and adjusted using 2019 PPP conversions. 1873 \$ (*own CPI*) 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. *Sweden* (1850) 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 Appendix (A.3). The dot corresponds to the point estimate, the thick line is the 95% confidence interval, and the thin line is the 99% confidence interval. For all measurements of compensation, the coefficient is negatively significant and of similar magnitudes.

A.6 Alternative Instrument

I carry out the estimation with an alternative instrument, slave population density. Recall, that areas which were growing their plantation production, had a higher demand for new slaves, and paid a higher price for purchase. Therefore, these territories received greater compensation. The previous instrument, *distance*, is related to the supply and cost of bringing slaves to the market. However, there is also the demand side which had the same effect of pushing prices for slaves up. Territories which could grow their plantation production had the space to do so. During the debates over abolition, “owners in the more densely populated islands immediately protested” ([Butler, 1995](#), p. 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](#), p. 137). Logically, less dense areas might have a harder time keeping slaves on the plantation

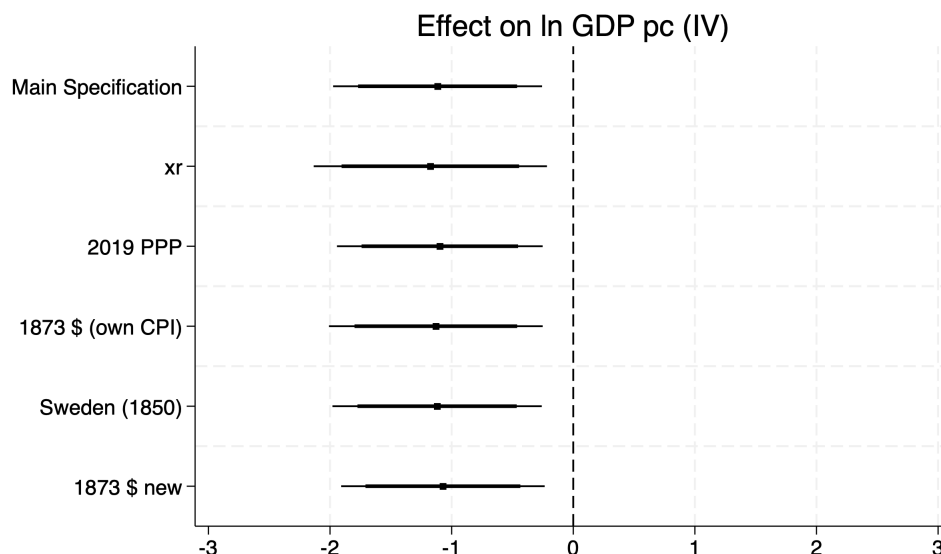


Figure A.3: IV, Compensation and Income with Different Compensation Measures

Notes: IV estimates with different compensation per slave measurements. The top coefficient, *Main Specification*, is the estimate from the original compensation measure $\ln comp_{1873}$. For *xr*, compensation is simply in US \$ at each abolition year using the respective exchange rates. 2019 *PPP*, compensation is the PPP adjusted 2019 values using current CPI. 1873 \$ (*own CPI*), compensation is similar to my main measure, but rather than taking the average 'world' CPI, I take the CPI for each colonizer. Therefore, each territory has a unique price index dependent on their colonizer. *Sweden* (1850), compensation is measured as the \$ value in Sweden in 1850. I used the Historical Currency Converter for this calculation (Edvinsson, 2016). Lastly, 1873 \$ *new* 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. The dot corresponds to the point estimate, the thick line is the 95% confidence interval, and the thin line is the 99% confidence interval. Colonizer fixed effects, independent dummy, and \ln slave pct are used as control variables. The instrument used is the minimum distance to slave markets in 1000 km.

after abolition, so higher compensation made sense. However, total population density might be related to past development as argued by [Acemoglu et. al. \(2002\)](#). The reason is that people can share ideas, products, labor, etc. that will speed up the development process. This might not be true of the Caribbean during this time since the territories were 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.

To address the concern for the exogeneity of total population densities, I use the log of slave population density ($\ln slave\ density$) as an instrument for compensation. The hypothesis is that if a territory had more slaves per area, they had less room to grow the plantation and demanded fewer imported slaves. Thus, they received relatively smaller amounts of compensation. Table [\(A.3\)](#) show the results of the this new instrumental variable strategy. Panel B has the first-stage

Table A.3: IV-alternative instrument, Relationship between Compensation and Income

	(1)	(2)	(3)	(4)	(5)
<i>Panel A: 2nd Stage, Dependent variable is ln gdp pc in 2019</i>					
ln comp (1873 \$)	-0.817** (0.364)	-0.774** (0.302)	-0.543 (0.340)	-0.876** (0.362)	-0.662* (0.355)
independent			-0.487* (0.257)	-0.206 (0.274)	-0.239 (0.260)
ln slave pct (1830)				-0.421** (0.171)	-0.104 (0.203)
ln resource					0.0616 (0.0438)
Colonizer fixed effects		X	X	X	X
R-squared	0.387	0.479	0.558	0.625	0.646
<i>Panel B: 1st Stage, Dependent variable is ln comp (1873 \$)</i>					
ln slave density	-0.101** (0.0385)	-0.112*** (0.0277)	-0.0975*** (0.0286)	-0.0907*** (0.0312)	-0.116** (0.0460)
independent			0.273 (0.181)	0.312 (0.196)	0.158 (0.257)
ln slave pct (1830)				-0.0878 (0.149)	0.144 (0.248)
ln resource					-0.0121 (0.0495)
Colonizer fixed effects		X	X	X	X
Adj. R-squared	0.177	0.579	0.601	0.589	0.564
<i>F-stat</i>	6.815	16.401	11.623	8.432	6.326
<i>Panel C: Exogeneity of Instrument, Dependent variable is ln gdp pc in 2019</i>					
ln slave density	0.0141 (0.0431)	0.00759 (0.0500)	0.000360 (0.0473)	0.0239 (0.0449)	0.0157 (0.0641)
Observations	28	28	28	28	20

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are in parentheses. IV estimates of Equation (1.2) are reported in Panel A. First stage estimates from Equation (1.3) 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 (1.1). 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. ln Resource average per capita value of exports of metals, oil, and gold. The instrument used is the log of slave population divided by territorial area. In Panel C, I add slave density into Equation (1.2) and estimate using OLS. For conciseness, I only show the estimates for slave density.

coefficients. Slave densities are significantly related to compensation, however the relationship is weaker than the main instrument of distance to slave markets. Only two of the F-stats are above the threshold of 10 for strong instruments. Panel C confirms that the instrument is unrelated to current incomes. A potential area of concern is that a higher slave density means a greater proportion of slaves, which has been documented to be negatively related with development. However, there is no significant relationship between slave percentage of the population and slave density. Panel A of Table (A.3) shows the second-stage estimations. In this alternative strategy, compensation has a negative effect on current incomes for three of the five regressions. In general, the magnitudes of the estimates are in between the OLS and main IV estimates.

A.7 The Case of Haiti

Haiti also suffered from compensation to slave-owners. However, their process was unique. After a successful revolution in 1804, Haiti became the first Black republic. The consequences of their freedom was severe. In 1825 France surrounded the country with warships and gave the Haitians a choice: pay 150 million francs to slave-owners for their property loss or we invade. The Haitian leaders chose the former but the newly independent territory was in no condition to raise the funds France demanded. They did not have a proper tax structure and were severely weakened from the independence war. After defaulting on multiple payments, France lowered the reparation price to 90 million francs. Haiti still struggled to pay and was compelled to take out loans, the debt now became known as ‘double-debt’. The full amount plus interest was not paid off until 1947 and totaled 112 million francs (Porter et. al. , 2022a).

Economists, mostly from the Paris School of Economics, have estimated this effect on the Haitian economy. Not only did the compensation put them in debt, but it could have been invested into the economy. If this was the case, and we assume that the compensation amount grew with the pace of the Haitian economy, then the opportunity cost of compensation would be \$21 billion in 2020 (Porter et. al. , 2022b). This is a conservative estimate, as Haitian growth was endogenous to the compensation process and was therefore reduced due to the need to pay off debt. Thomas

Piketty places the estimate at \$42 billion in 2020 based off using a growth rate halfway between Haiti and Latin America.

Haiti's slave population prior to the revolution was about 500,000. Combining this with the conservative estimate of \$21 billion and converting it to 1873 levels yields a compensation per slave payment of \$2,398 in 1873, which is over 10 times the next highest compensation amount. I add Haiti to the observations with this amount and estimate Equation (1.2). Although the process was different, there was one key similarity. To pay off the debt, Haitian leaders enslaved their own population. Compensation for Haiti led to the continuation of the plantation and an environment of conflict, just like the other territories. The results are shown in Table (A.4), and are significant in all specifications. This should be no surprise as Haiti is the poorest country in the western hemisphere today and they had the highest amount of compensation per slave to slave-owners.

Table A.4: OLS, Relationship between Compensation and Income with Haiti

	Dependent variable is ln gdp pc in 2019				
	(1)	(2)	(3)	(4)	(5)
In comp (1873 \$)	-0.856*** (0.118)	-0.933*** (0.134)	-0.758*** (0.158)	-0.832*** (0.146)	-0.843*** (0.183)
French colonizer		0.113 (0.225)	-0.213 (0.275)	-0.0890 (0.255)	0.312 (0.430)
Dutch colonizer		-0.269 (0.218)	-0.457* (0.230)	-0.548** (0.212)	-0.539* (0.290)
USA colonizer		0.331 (0.329)	0.0284 (0.352)	-0.256 (0.340)	- -
independent			-0.474* (0.252)	-0.284 (0.241)	-0.256 (0.289)
In slavepct (1830)				-0.411** (0.168)	-0.187 (0.248)
In resource					0.0731 (0.0558)
Observations	29	29	29	29	21
R-squared	0.662	0.707	0.746	0.800	0.811

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. OLS estimates of Equation (1.2) are reported with Haiti included. The dependent variable is the natural log of current per capita GDP in 2019. The compensation measure, In comp (1873 \$), is the amount of compensation per slave in 1873 US dollars using CPI adjustment according to Equation (1.1). 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. Ln resource average per capita value of exports of metals, oil, and gold.

A.8 Compensation Process

The British government agreed to compensate slave-owners a total of £20 million⁶⁴, or 40% of government expenditure in 1834. According to [Draper \(2010, p. 208\)](#), the equivalent of the same share of spending is £200 billion today. The £20 million was divided among the colonies based on the average prices they paid per slaves in previous years.⁶⁵ 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, p. 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 \(1998, p. 130\)](#), 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, p. 405-406](#)).⁶⁶ 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, p. 223](#)).

⁶⁴Compensation was paid out from 1835-1843

⁶⁵This also includes their colonies in Mauritius and the Cape of Good Hope.

⁶⁶Reunion, 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, p. 167)⁶⁷. 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.⁶⁸ 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, p. 174). Puerto Rican⁶⁹ slave owners were the biggest winners when Spain abolished slavery on the island in 1873.⁷⁰ 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. Barthelemy,⁷¹ abolished slavery in 1847. The government rewarded slave owners with a total of 250,000 french francs (Knight, 2003) which is roughly

⁶⁷The Dutch did pay slave owners 60 guilders per slave if the slave was promised manumission prior to abolition (Fatah-Black et. al., 2023, p. 167)

⁶⁸The islands of St. John, St. Thomas, and St. Croix. USA bought the US Virgin Islands from Denmark in 1917.

⁶⁹USA bought Puerto Rico from Spain in 1898

⁷⁰It was not until 1886 that slavery was abolished in Cuba but slave owners did not receive financial compensation.

⁷¹Purchased by France in 1878.

358.27 Swedish krona per slave according to the slave population estimated in 1847 (Beauvois, 2016).

A.9 Country Backgrounds

Table A.5: Territory Backgrounds-full

Colony	Code	GDP pc (2019)	Slave population (1830)	Compensation per slave (1873 \$)	Compensation per slave (PPP 2019 \$)	Slave pct (1830)	Apprenticeship period
<i>Britain (1834)</i>		22481	663127	216.45	4194.46	81%	1834–1838
Anguilla	AIA	25229.43	2260	148.06	2869.15	79%	-
Antigua and Barbuda	ATG	20383.22	28635	149.55	2898.13	80%	-
The Bahamas	BHS	36856.81	9995	115.15	2231.56	56%	-
Barbados	BRB	16848.96	83150	186.19	3608.17	80%	-
Belize	BLZ	6855.59	1895	455.38	8824.81	45%	-
Bermuda	BMU	79814.77	4277	112.16	2173.60	39%	-
Dominica	DMA	11685.98	14165	169.74	3289.38	73%	-
Grenada	GRD	16061.98	23645	224.33	4347.2	84%	-
Guyana	GUY	13320.57	83545	437.44	8477.03	88%	-
Jamaica	JAM	8928.11	311070	171.24	3318.36	84%	-
Montserrat	MSR	19974.50	6400	149.55	2898.13	85%	-
St. Kitts and Nevis	KNA	27529.55	26365	148.06	2869.15	82%	-
St. Lucia	LCA	15094.65	13275	223.58	4332.71	73%	-
St. Vincent and the Grenadines	VCT	11894.91	22250	228.81	4434.14	82%	-
Trinidad and Tobago	TTO	26736.16	32200	326.02	6317.92	67%	-
<i>The Netherlands (1863)</i>		28546.26	61932	138.05	4109.89	73%	-
Aruba	ABW	36799.81	393	101.39	3018.52	14%	-
Bonaire	BON	27000	547	101.39	3018.52	37%	-
Curacao	CUW	22561.62	5894	101.39	3018.52	39%	-
Saba	SAB	24300	700	101.39	3018.52	70%	-
St. Eustatius	EUS	38400	1614	101.39	3018.52	71%	-
Sint Maarten	SXM	35603.58	4000	50.7	1509.23	67%	-
Suriname	SUR	15158.82	48784	152.09	4527.78	87%	1863–1873
<i>France (1848)</i>		25690.80	202890	135.5	3360.55	80%	None
French Guiana	GUF	18759.6	19102	179.67	4456.15	84%	-
Guadeloupe	GLP	28970.4	97339	136.29	3380.08	81%	-
Martinique	MTQ	29342.4	86449	124.85	3096.49	79%	-
<i>Danish West Indies (1848)</i>	VIR	40021.78	26879	73.07	2150.89	65%	1848–1849
<i>Puerto Rico (1873)</i>	PRI	37453.79	34240	221.48	7808.4	11%	1873–1876
<i>Swedish West Indies (1847)</i>	BLM	52000	1387	131.89	2939.19	35%	None
Total		26556.67	990455	191.13	4086.07	65%	-

Notes: The table reports an overview of the 28 territories in this study, separated 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 (1.3) and Appendix (A.3)). Lastly, apprenticeship period refers to the years following abolition where slaves remained tied to their slave owners.

Appendix B: Chapter 3

B.1 Steady-state Properties

$$J = \begin{bmatrix} -\frac{\zeta}{\mu_N + \mu_S - 1} \left[\frac{(1-\tau)\epsilon_S s_S \sigma_S P^{\zeta-1}}{a_S} \right] & \frac{1}{\mu_N + \mu_S - 1} g_N \\ \zeta \psi \frac{\tau^\psi s_S^\psi \sigma_S^\psi P^{\zeta\psi-1}}{a_S^\psi} - \zeta \phi \frac{(1-\tau)s_S \sigma_S P^{\zeta-1}}{a_S} & 0 \end{bmatrix}$$

$$Tr < 0, Det > 0$$

Proof: Bottom left term is negative:

Step 1: Like terms in left hand side and right hand side are canceled:

$$\psi \frac{\tau^\psi s_S^\psi \sigma_S^\psi P^{\zeta\psi}}{a_S^\psi} - \phi \frac{(1-\tau)s_S \sigma_S P^\zeta}{a_S} \quad (25)$$

Step 2: Plug in steady-state value of P :

$$\psi \frac{\tau^\psi s_S^\psi \sigma_S^\psi}{a_S^\psi} \left[\frac{\tau^{\frac{\psi}{1-\psi}}}{[\phi(1-\tau)]^{\frac{1}{1-\psi}}} \left(\frac{a_S}{a_S \sigma_S} \right) \right]^\psi - \phi \frac{(1-\tau)s_S \sigma_S}{a_S} \left[\frac{\tau^{\frac{\psi}{1-\psi}}}{[\phi(1-\tau)]^{\frac{1}{1-\psi}}} \left(\frac{a_S}{a_S \sigma_S} \right) \right] \quad (26)$$

Step 3: Combine terms:

$$\left[\frac{\tau}{\phi(1-\tau)} \right]^{\frac{\psi}{1-\psi}} (\psi - 1) \quad (27)$$

Since $\psi < 1$, the bottom left term of the Jacobian is always negative if the tax rate, τ , is positive.

B.2 Country List

Table B.1: Country Categories

Africa	Asia	LAC	North
Algeria	Bahrain	Argentina	Albania
Angola	Bangladesh	Bahamas, The	Australia
Benin	China	Barbados	Austria
Burkina Faso	India	Belize	Belgium
Burundi	Indonesia	Bolivia	Bulgaria
Cameroon	Iran, Islamic Rep.	Brazil	Canada
Chad	Jordan	Chile	Cyprus
Comoros	Kuwait	Colombia	Denmark
Congo, Dem. Rep.	Lebanon	Costa Rica	Finland
Congo, Rep.	Malaysia	Dominican Republic	France
Cote d'Ivoire	Maldives	Ecuador	Germany
Egypt, Arab Rep.	Mongolia	El Salvador	Greece
Ethiopia	Myanmar	Guatemala	Hungary
Gabon	Nepal	Guyana	Iceland
Gambia, The	Oman	Haiti	Ireland
Ghana	Pakistan	Honduras	Israel
Guinea	Philippines	Jamaica	Italy
Kenya	Qatar	Mexico	Japan
Liberia	Saudi Arabia	Nicaragua	Korea, Rep.
Madagascar	Singapore	Panama	Malta
Malawi	Sri Lanka	Paraguay	Netherlands
Mali	Syrian Arab Republic	Peru	New Zealand
Mauritania	Thailand	St. Lucia	Norway
Mauritius	Turkiye	St. Vincent & the Grenadines	Poland
Morocco	United Arab Emirates	Suriname	Portugal
Mozambique	Viet Nam	Trinidad and Tobago	Romania
Nigeria		Uruguay	Spain
Rwanda			Sweden
Senegal			Switzerland
Sierra Leone			United Kingdom
South Africa			United States
Sudan			
Tanzania			
Tunisia			
Uganda			
Zambia			
Zimbabwe			

B.3 Stationarity Tests

Table B.2: Dickey Fuller Unit Root Test

countrycode	df_import	df_GDP	df_RER	df_dGDP	df_dimport	df_dRER	Level	FirstDiff
AUS	-1.656944	-1.598423	-2.509476	-5.215638	-3.395428	-3.306602	I(1)	I(0)
BGD	-2.219184	.7041931	-2.272477	-3.24674	-4.392202	-5.043173	I(1)	I(0)
BHS	-1.331766	-2.696048	-3.901434	-4.538834	-2.008	-5.279181	I(0)	I(0)
BOL	-2.320611	-3.4502	-4.942049	-2.256852	-3.920747	-3.016801	I(0)	I(0)
BRB	-1.653803	-3.009898	-2.55376	-3.701296	-2.886762	-3.999959	I(1)	I(0)
CHE	-2.485235	-2.802083	-2.477255	-4.249	-3.308873	-3.842216	I(1)	I(0)
CHN	-1.625423	-1.108829	-1.714387	-3.0279	-3.295164	-3.329803	I(1)	I(0)
CMR	-2.253299	-2.516663	-2.046502	-2.42896	-3.719274	-3.254477	I(1)	I(0)
COG	-1.827904	-2.343333	-2.161628	-3.492585	-1.841217	-3.433757	I(1)	I(0)
COM	-2.414679	-1.31155	-2.498006	-3.359045	-3.804426	-4.469252	I(1)	I(0)
CYP	-1.129436	-1.859258	-2.528309	-2.592667	-3.311533	-3.752051	I(1)	I(0)
DOM	-2.022922	-2.431059	-2.02261	-4.50957	-4.108448	-4.172699	I(1)	I(0)
ECU	-2.452287	-2.056343	-3.6999	-2.587994	-3.46175	-5.617939	I(0)	I(0)
JOR	-2.318669	-2.926016	-1.666417	-3.240858	-2.519978	-4.426471	I(1)	I(0)
JPN	-2.00944	-2.576062	-1.93279	-2.885397	-4.065511	-4.842996	I(1)	I(0)
MAR	-2.600996	-1.72352	-4.563172	-2.567408	-3.177225	-3.689162	I(0)	I(0)
MDG	-3.181397	-1.95589	-1.938785	-4.307318	-5.001463	-4.146023	I(1)	I(0)
MOZ	-2.624739	-4.957395	-1.234517	-3.226154	-3.610324	-3.667772	I(1)	I(0)
MUS	-1.981878	-1.719028	-2.182521	-4.69863	-3.835737	-4.081726	I(1)	I(0)
NIC	-2.060607	-2.384784	-2.51359	-2.129095	-4.135336	-3.093826	I(1)	I(0)
NLD	-1.594479	-1.136274	-2.099276	-3.099205	-3.707224	-3.772403	I(1)	I(0)
NZL	-2.67952	-2.604125	-3.225414	-2.66843	-3.615054	-3.603631	I(0)	I(0)
PER	-3.328794	-2.292156	-1.810019	-3.624365	-3.540287	-3.197119	I(1)	I(0)
PRT	-1.538643	-1.58596	-4.082104	-2.792499	-3.205868	-3.806357	I(0)	I(0)
PRY	-2.275599	-2.046451	-1.621669	-2.489237	-2.767782	-5.081196	I(1)	I(0)
RWA	-1.692385	-1.282865	-1.690377	-3.848273	-3.275605	-4.059151	I(1)	I(0)
SAU	-2.76623	-4.890316	-3.77094	-4.214175	-3.579264	-5.564115	I(0)	I(0)
SEN	-2.359062	-1.001326	-1.973831	-2.963843	-3.403162	-3.071212	I(1)	I(0)
SLE	-2.592965	-1.311767	-2.132119	-3.275283	-3.648249	-3.265745	I(1)	I(0)
SUR	-3.177584	-2.08407	-9.646749	-2.079144	-2.866146	-3.404537	I(1)	I(0)
SWE	-1.965765	-2.061694	-2.999768	-3.357563	-3.785907	-4.222684	I(0)	I(0)
TUN	-1.855592	-2.237822	-1.13098	-3.28825	-2.971633	-3.88306	I(1)	I(0)
VNM	-1.940581	-2.482424	-2.243433	-2.980882	-3.151906	-3.356026	I(1)	I(0)
ZMB	-2.889776	-1.965594	-1.734783	-1.600344	-3.798626	-3.23154	I(1)	I(0)

Notes: Table shows the results for the Dickey Fuller unit root test. For each country the variables follow are stationary in levels or first-differences, which confirms the validity of the ARDL ECM.

B.4 Country Elasticities

Table B.3: Elasticities by Country

code	export elasticity	import elasticity	SE	p-val	N	R-sq.
ZMB	4.590367	1.784504	.5980872	4.96e-08	35	.6664048
ZAF	3.367026	0	.3987584	4.68e-09	35	.6116769
VNM	5.634388	1.268671	.1429189	9.60e-27	35	.832706
URY	2.736264	1.726449	.4342989	1.14e-06	35	.6224613
UGA	3.727338	2.076493	.417693	8.18e-10	35	.5481967
TUN	4.007614	2.337551	.7077656	4.04e-06	35	.6711189
TCD	5.239069	1.572705	.6636008	8.23e-09	35	.3189542
SWE	1.33383	2.29733	.5025081	.0127655	35	.7611427
SUR	3.10995	3.025747	.5212196	1.53e-06	35	.2584219
SLE	3.11837	1.170184	1.113064	.0086837	35	.2249295
SEN	2.671723	2.479365	.0934298	7.59e-24	35	.4965669
SAU	2.25973	1.959137	.5537729	.0002918	35	.1800839
RWA	6.405178	1.403589	1.357462	.0000481	35	.2910608
PRY	3.600213	1.210051	.494942	3.49e-08	35	.2389544
PRT	1.624513	3.686169	.4121736	.000469	35	.7779837
PER	3.634061	2.059076	.3932881	5.35e-10	35	.5935025
NZL	1.770342	1.991911	.1219119	2.81e-14	35	.7075799
NLD	1.71454	2.604117	.282344	1.31e-06	35	.6451254
NIC	3.111578	2.410497	.5290397	2.52e-06	35	.5053523
MUS	0	1.414286	.922099	.1884186	35	.5756564
MOZ	4.731176	1.600139	1.203671	.0004828	35	.334559
MDG	2.598568	1.78741	.3477018	2.03e-08	35	.3773454
MAR	2.569386	2.085667	.0625876	1.37e-28	35	.6463819
KEN	2.159355	0	.3290142	2.50e-07	35	.2420235
JPN	.784457	4.119748	.1488475	.000012	35	.6470082
JOR	2.95412	1.8786	.468851	6.03e-07	35	.3402308
IDN	2.645886	0	.2935819	1.76e-09	35	.6622319
GTM	1.542014	0	.2543209	2.92e-06	35	.7265835
ECU	2.695727	2.773271	.4067929	2.45e-07	35	.2544983
DOM	0	.9058228	.701883	.8063758	35	.3935422
CYP	2.421042	1.991981	.2127248	1.34e-12	35	.3478763
COM	1.494305	2.455216	.3408163	.0001242	35	.2532866
COG	3.842983	3.460268	.5863907	3.00e-07	35	.316997
CMR	1.735128	1.95108	.2909173	1.54e-06	35	.48417
CHN	5.25121	1.493041	.2733874	8.40e-15	35	.8647878
CHE	1.441949	1.661325	.1638957	8.27e-10	35	.6865543
BRB	1.276829	5.293211	.3372394	.0006595	35	.252879
BOL	0	1.690639	8.289659	.9140952	35	.3032173
BHS	2.016017	4.766421	.5997347	.0020721	35	.2145746
BGD	4.210871	1.386514	.4972778	2.27e-08	35	.7283763
AUS	2.265847	2.075631	.1246401	2.15e-17	35	.6852928

Notes: Table shows the results for Equation (3.23) in Column 2 and Equation (3.24) in Column 3 for years 1985-2019, using the ARDL-ECM specification. The coefficients in each column are used to create the elasticity ratio variable. The table only shows the standard errors, p-values, R-squared for the export elasticity equation. However, in for each country, the p-values are also significant for the import elasticities.

B.5 Summary Statistics-Estimating Elasticity Ratios

Table B.4: Summary Statistics

variable	mean	SD	N	min	max
ln import	22.442	2.11	1640	17.088	28.212
ln export	22.181	2.373	1640	16.092	28.58
ln world GDP	26.661	.334	1640	26.042	27.239
ln own GDP	24.321	2.013	1634	19.798	30.291
ln RER	2.576	3.673	1640	-19.625	10.073

Notes: Summary statistics for Equations (3.23, 3.24). *import* and *export* are the value of imports and exports for country, *i*. *world GDP* and *GDP* are the GDPs in time *t* for the entire world and each specific country *i*, respectively. *RER* is the real exchange rate for country *i* in time *t*.

Table B.5: Summary Statistics-Correlations with Elasticity Ratios

variable	mean	SD	N	min	max
ratio	1.644	1.162	34	.19	4.563
avg. informal sector growth	-.677	.692	38	-2.94	.466
avg. sh primary export growth	.522	.547	38	.06	2.512
avg. ag productivity growth	.862	1.598	38	-3.109	4.239
avg. sh gross capital formation growth	.019	.032	38	-.026	.086
avg. employment rate	28.636	113.902	38	.117	703.365

Notes: Summary statistics for Equation (3.22). *ratio* is the elasticity ratio for country *i*. The other 5 variables are the average growth in the share of informal sector output, the average growth in the share of primary exports to total exports, the average growth in agricultural productivity, the average growth in the share of gross capital formation to total output, and the average employment rate for the time period 1985-2019.