The Impact of Colonial Ties of the Trade Relationships of African Countries

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List of Acronyms

WTO	World Trade Organization
OECD	Organization for Economic Cooperation and Development
IMF	International Monetary Fund
GDP	Gross Domestic Product
HQ	Headquarters
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
COLDAT	Harvard Colonial Dates Database
OLS	Ordinary Least Squares
DID	Difference-in-Difference
SUTVA	Stable Unit Treatment Value Assumption
EU	European Union
FDI	Foreign Direct Investment

Abstract

This study aims to analyze the impact of colonial ties on the trade relationships of African countries and their trading partners and the mechanisms driving this effect. In this analysis, the researcher aims to contribute to the literature on colonial history and trade through updated data and to the larger conversations on the legacies of colonialism. Initial exploratory analysis was conducted using an OLS model with two-way fixed effects on trade data at the country-pair level from 1948 - 2019. The Difference-in-Difference method was then applied to analyze the impact of colonial history on country pairs in which the African country had been colonized but was independent in the year of observation. An extended diff-in-diff model, including interaction terms, was used to test mechanisms that may explain any found effect. When all African countries in a country pair are independent, trade increases by 0.201% relative to trade between county pairs where this condition is not met after independence, country pairs with colonial ties and an African importer trade 0.285% less than country pairs in which the exporting country is or has been the colonizer of the importing country, and the importing country has not gained independence. The negative effect of independence on the trade relationships of country pairs with colonial ties was found to be especially significant for country pairs in which the African country had, or has, a port used during the transatlantic slave trade, or a port used as the headquarters of a colonial trading company. Given the scale and growth of the African trade market, the researcher recommends that European policymakers increase efforts to expand trade with Africa and that organizations like the World Trade Organization account for additional factors, such as colonial history, in their guidelines and agreements to account for this effect.

Relevance to Development Studies

This topic is relevant to Development Studies as it aims to capture the impact of colonialism on African trade relationships. Trade is a large component of all economies. Many economists and politicians believe that international trade could be used to grow the economies of African countries and alleviate poverty. Understanding the impact of colonial ties on trade relationships in Africa contributes to the larger conversations on the legacies of colonialism and the impact of trade prevalent in Development Studies research.

Keywords

Colonialism; Trade relationships; Difference-in-Difference; Regression analysis; Colonial history

Chapter 1: Introduction

1.1 Research Context: Debates on the Ethics and Efficacy of Colonialism

According to a 2019 survey conducted by YouGov, an international research and analytics group based in the United Kingdom, Dutch, Japanese, British, and French individuals surveyed were significantly more likely to believe that colonialism improved former colonies rather than creating harm. Additionally, "one-quarter of Britons and Dutch people wish their countries still had their empires" (Smith 2019). While these statements may come as a surprise, this assumption has been the basis for colonial and imperialist missions for centuries. Colonial and imperial projects were often historically justified by claims that they introduced humanization, sanitation, culture, progress, and development. The assumption that colonization was purely beneficial to the colonized has a stronghold, even today, as this survey indicated.

This assumption has been upheld, additionally, in academic work. In 2017, Bruce Gilley's article "The Case for Colonialism" was published in Third World Quarterly, a peer-reviewed academic journal focused on issues related to Development Studies. Gilley (2017) argued that colonization was both "beneficial and legitimate," claiming that current anti-colonial practices and schools of thought were objectively detrimental to sustainable development. Gilley outlined what he described to be the three ways in which colonialism can, and possibly should, be recovered. In his paper, Gilley defends South African politician Helen Zille, who spoke about the success of Singapore due to "valuable aspects of colonial heritage" in 2017. He cites several academics who share the optimistic view of colonization highlighted by the 2019 YouGov survey. Gilley cites Chesterman (2003), who argued that perhaps a lack of coloniality was to blame for inefficiencies in modern state-building. Ignatieff (2002) is cited for his argument on the necessity of imperialism, despite the popularity of decoloniality. The point stands: Gilley, much like the survey respondents previously described, is seemingly not alone in his view.

On the opposite end of this pro-colonial discourse, many current social, academic, and political movements focus on or include the concept of decolonization as a primary objective. Movements have pressured ex-colonizers to make symbolic and financial reparations to their former colonies. Many of these movements have been successful. In 2008, Italy signed a treaty with Libya to acknowledge their formal colonial rule and a promise to pay reparations through foreign aid. In 2013, former British Foreign Secretary William Hague apologized formally for the crimes committed by British imperial officers during the Kenya Emergency. Six thousand Kenyans received a collective reparations package of 19.9 million great British pounds in addition to this apology. More recently, in February of 2022, Dutch Prime Minister Mark Rutte issued a formal apology to Indonesia for the excessive violence used by the Dutch during their colonial rule.

Decolonial movements have gained momentum as the success of these actions continues. Activists continue to call for additional education, the implementation of decolonial ideologies across institutions, and the increased issue of financial reparations for former colonies. With increased pressure placed on governments, institutions, and policymakers to address the consequences of colonization, academic research on its impact is timely and relevant.

1.2 Research Topic

This study analyzes the impact of colonial ties on trade relationships between African countries and their trading partners and the mechanisms driving this effect. In this analysis, the researcher aims to contribute to the literature on colonial history and trade through updated data. It is necessary to conduct further research because peer-reviewed studies focused on this topic are limited, report conflicting results, and only include data through 2006. Early studies such as Eichengreen and Irwin (1996) and Rose and VanWincoop (2001) conclude that sharing a colonial history, meaning that one country in the pair colonized the other country, positively affects trade flows. The most recent study on the topic, by Head et al. (2011), disagrees; they conclude that sharing a colonial history negatively affects trade flows, particularly for countries that experienced violent independence movements. This discrepancy suggests that an updated analysis would be of value.

Additionally, this study tests several mechanisms which may explain any possible effect found. Testing mechanisms allow the researcher to analyze potential causality and further contribute to the literature. Several econometric studies focus on the impact of colonial history through mechanisms such as shared language and colonizer identities, such as Wei (1996), Sousa and Lochard (2012), and Tadei (2021). There is not, however, a peer-reviewed study that includes these mechanisms common in colonial trade literature and mechanisms identified through historical analysis, such as the presence of ports or historical events.
Finally, this paper aims to inform European policymakers, particularly those working in the governments and institutions of countries that are ex-colonizers. Trade policy between Europe and Africa is significant given the continent's expanding economies and wealth of natural resources.

1.3 Study Scope

This study includes fifty-four African countries and their trading partners organized in country pairs. Included trade data spans from 1948 through 2019; this period covers the broadest time scale available during data collection. Africa's lengthy and diverse colonial history and trade policy relevance motivated the study scope choice. Since the majority of Africa was colonized, focusing on the continent in this analysis allows the researcher to maximize observations used in the regression models. The historical context, and variety of empires, tied to African colonial history are particularly relevant to both development studies and the mechanisms associated with trade. This is discussed further in Chapter Three.

Studies on the trade relationships of African countries are particularly relevant to European policymakers because Africa is the fastest growing continent in the world. Increased population signifies the potential for a wider trade market; with more people to buy goods, more goods can be produced and sold so long as infrastructure can support their production. Africa's economies are also rapidly growing. According to the World Bank (2022), real GDP growth across the continent averaged 4.1% in 2021. Other countries are prioritizing trade with Africa, as these growth patterns signify large trading opportunities. In 2021, trade between China and Africa reached a record high, further cementing China as Africa's largest trading partner. If Europe wishes to be a competitive global trading partner, it may be in their best interest to reevaluate their trade relationship with Africa, particularly

in the face of social and political pressure to make economic reparations to their former colonies.

This study is also of policy relevance for institutions like the World Trade Organization (WTO) that work to facilitate global trade. In their mission statement, the World Trade Organization states that the "systems overriding purpose is to help trade flow as freely as possible – provided there are no undesirable side effects – because this stimulates economic growth and supports the integration of developing countries into the international trading system" (2022). In recent years, the World Trade Organization has been heavily criticized for reinforcing the global world order because their free trade rules do not properly address the difficulties free trade may create for developing economies (Beattie 2022). If the WTO truly does aim to aid in the integration and growth of developing economies, understanding the impact colonial history may have on these economies would be of particular concern. Integration and support of these countries and their trade relationships may not be fully realized if influences impacting these relationships are not known. The policy relevance of this study in the case of both the WTO and European policymakers is addressed in Section 8.5.1 on the relevance of results reported by mechanism testing of Model 4.

1.4 Study Organization

The remainder of this study is organized as follows. Chapter Two presents a review of literature relevant to this study. Chapter Three adds historical context to the study through a description of Africa's colonial history and the motivations driving colonial projects. Mechanisms through which colonial history may impact trade are discussed in Chapter Four. Data used in this study is described in Chapter Five. Chapter Six presents two econometric models used in initial, exploratory analysis, and their results. These models are extended in Chapters 7 and 8 using two Difference-in-Difference regression Models. Results of each model, study limitations, and recommendations for policymakers and future research is also discussed. Concluding remarks are presented in Chapter 9.

Chapter 2: Review of Relevant Literature

2.1 Trade Flows and Colonial History

Kleinman is commonly thought to be the first to write explicitly on the impact of colonialism on trade. His 1976 study analyzed the effect of independence on trade and colonialism's decline from 1960 to 1970. Kleinman uses the share of an ex-colonizers overall trade derived from former colonies to test hypothesized trade domination commonly attributed to colonization. Kleinman reported that cross-sectional comparison revealed that trade patterns did not reflect inhabitant preferences, as proposed by economic theory; the persistence of trade share explains this despite independence. Kleinman did note, however, that independence resulted in a rapid decrease in overall trade dependency, though this dependency was still present in 1970. These conclusions reinforce the belief that despite independence, ex-colonizers may still dictate trade with former colonies, potentially to the point of exploitation.

In later studies, the impact of colonial history was accounted for in model specification through dummy control variables. Eichengreen and Irwin (1996) wrote about the role of history across bilateral trade flows. Their analysis used an augmented gravity model, including a dummy variable for colonial history meant to capture British colonies, members of the British Commonwealth, the colonial relationship between the United States and the Philippines, and the colonial relationship between the Netherlands and Indonesia. The authors used bilateral trade data from the International Monetary Fund (IMF) from the inter-war years (1928 and 1938) and post-war years (1949, 1954, and 1964). Results indicated that all countries with colonial relationships traded more than expected. Further, Eichengreen and Irwin (1996) reported that former British colonies traded "disproportionately more with one another in 1949," which the authors attribute to history.

Rose and van Wincoop (2001) included a dummy variable to account for countries with a common colonizer and colonial history in their augmented gravity model used to analyze the impact of currency unions on bilateral trade. This analysis uses data from 1970 to 1995 from 200 countries, sourced from IMF trade statistics. Results indicate that countries with a shared colonizer trade more than countries without a shared colonizer; this effect was positive (0.68) and statistically significant. Countries with colonial history, where one country acted as a colonizer and the other as a colony, traded more than countries without colonial history; the effect was positive, large (1.74), and statistically significant.

Expanding on the work of Rose and van Wincoop, Head et al. (2011) use an augmented gravity model to analyze the erosion of trade links following colonial independence. Data in this analysis is sourced from IMF trade statistics between 1948 and 2006. Results indicate a small negative effect of colonial history on trade in the short run. Notably, colonies with hostile independence movements report a large, immediate decrease in trade. In the long run, this effect is much larger; by the fortieth year of independence, trade between former colonies and ex-colonizers contracted almost 65% (Head et al. 2011). Trade with former siblings, countries with the same ex-colonizer, is said to decrease at a similar rate. The authors note that trade with third-party countries also reduces, though only by 20% over this period. Depreciation of trading capital is offered as a possible explanation for this decrease, though the authors suggest the need for extended analysis to determine causality. It is important to note that Head et al. (2011) is the most current peer-

reviewed empirical study analyzing the impact of colonial history on post-independence trade flows.

2.2 Empirical Analysis of Included Mechanisms

2.2.1 Shared Language

Additional empirical studies specifically analyze the impact of various mechanisms through which colonial history may impact trade. Authors used shared language in multiple l studies to capture colonial history, as many former colonies speak the language of their colonizer. Shared language is additionally vital to trade; a 2015 meta-analysis of 701 studies reported that, on average, shared language between trading partners increased trade flows by 44% (Egger and Lassman). Rose and van Wincoop (2001) also aimed to capture colonization's impact through shared language. Results reported that countries with a shared language traded more (0.48) than countries without a shared language. It is important to note that this dummy variable may overestimate the impact of colonial language history, as this also includes countries that share a language but did not have colonial histories, such as France and Belgium. Other studies, however, report similarly positive results.

Wei (1996) accounted for the impact of shared language in their study of home bias across goods markets. Wei found that sharing a common language had a positive, significant impact on bias in good markets. Hummels et al. (2001) cite common language as a potential determinant of trade growth in their analysis of vertical specialization throughout global trade. Eaton and Kortum (2002) analyze the impact of technology and geography on bilateral trade using a Ricardian trade model. The study uses data on trade patterns of OECD countries from 1990. They report that sharing a common language reduces trade barriers by six percent.

More recently, Stack et al. (2019) wrote about the impact of colonial history on the sugar trade. An augmented gravity model is used to analyze data on sugar imports into 25 OECD countries from all other countries between 1961 and 2016. Stack et al. draw three main conclusions. First, results indicate that the impact of colonial history differs across climates and locations of former colonies; former colonies in the southern hemisphere export more sugar to the studied OECD countries than former colonies in the north. Second, the impact of a common language depends on the proportion of the former colony's population that speaks this language. Finally, the authors do not find tariffs to be a barrier to the sugar trade "despite a long tradition of protectionism in the sugar industry" (Stack et. al 2019).

2.2.2 Empire Identities

Mitchener and Weidenmier (2008) wrote about the impact of empires. Using an augmented gravity model, the authors analyze bilateral trade data from 1870 to 1913, which they refer to as the Age of High Imperialism. Results indicate that countries belonging to an empire reported trade levels twice as high as those who were not a part of an empire. Further, they state that this increase in trade remained constant across empires, meaning the colonizer's identity was not significant in the rise in trade.

Economists de Sousa and Lochard (2012) uphold this view. They use a gravity model approach to analyze the impact of colonial history on overall trade in former British and French colonies. The authors initially found that former British colonies trade more than

former French colonies. However, controlling for potential endogeneity revealed that this increase in trade was not caused by British colonization. The authors argue that pre-colonial trade could be responsible for the increase in current trade of former British colonies but note that a lack of pre-colonial data would make future research challenging.

Most recently, Tadei (2021) used export price data to analyze the trading behavior of Britain and France with their former colonies. Britain has commonly been perceived as more open to free trade, a belief Tadei says has been untested empirically but upheld by public perception of France's monetary policies and the Franc zone's longevity. Tadei finds that empire identity matters less than commonly believed; Britain was not found to be more likely to engage in free trade, and only did so when implementing monopsonies was not a viable option" (2021).

2.3 Study Contribution

Through empirical analysis, this study aims to inform policymakers and contribute to the literature on colonial history and trade relationships. A review of this literature indicates three opportunities for expansion which this paper aims to undertake. First and foremost, it is necessary to conduct an empirical analysis of colonial ties and trade using updated data for policymakers to be informed. The most current study on the impact of colonial history on trade relationships, Head et al. (2011), only includes data through 2006. This study contributes an additional fifteen years of data through 2019. Discrepancies in the reported impact of colonial ties also indicate further research opportunities. Finally, testing mechanisms identified in previous academic work and historical analysis is essential. No author mentioned above tests mechanisms sourced through both methods within the same study. Mechanisms identified through literature and historical research are discussed in Chapter Four.

Chapter 3: Historical Context

In addition to understanding the body of literature to which this study aims to contribute, it is imperative to understand the historical context surrounding this research. Chapter Three provides an overview of Africa's colonization and resulting decolonization, paying particular attention to the motivations for European colonization in Africa and practices implemented during decolonization.

3.1 Early Colonization of North Africa

Colonization of the African continent dates back over three millennia. The Phoenician, Greek, and Roman empires are credited with the earliest conquests to colonize Africa. The Phoenicians established Utica in 1100 BC and later Carthage in 814 BC in modern-day Tunisia (Harden 1971). Alexander the Great's famed conquest of Egypt began in 332 BC. The Romans later seized several African cities in the north, several of which were then controlled by the Byzantines through the earliest centuries of the common era (Boardman 1973). Arab empires took control over North Africa in the seventh century and maintained control for hundreds of years.

North Africa was divided into several different Muslim Berber empires. Economic activity was primarily concentrated along the coast of these empires, where merchants embarked on and returned from trading missions to South Asia and parts of the Middle East. This area was called the Barbary Coast by most Europeans, referring to both the Berber empires and the Barbary pirates, known to have controlled large portions of the Mediterranean Sea. Barbary pirates in the Mediterranean disrupted European trading routes to Asia and instilled fear in many European governments; the pirates were notable not only for their raiding of merchant ships but also for their slave-taking (Pryor 1988). This fear was a primary motivator for early colonial projects undertaken by Portugal, which is described further in section 3.2.1. Barbary pirates are said to have captured so many enslaved Europeans that the Catholic Church established the Trinitarians, a religious order entirely devoted to offering ransom for enslaved Europeans in the Berber empires. Despite the efforts of the Catholic Church, the practice of slave-taking escalated into the 15th century, when the Ottoman empire's presence in the Mediterranean and North Africa coast expanded the North African slave market.

The Ottoman Empire took control of Algeria in 1532 and, by the beginning of the 17th century, had additional strongholds in Libya, Tunisia, and Morocco. To meet demand at the slave markets established under Ottoman rule, Barbary pirates increased both the frequency and scope of their raids. Historian Robert Davis estimates that from 1530 to 1780, 1.25 million Europeans were enslaved due to the Barbary raids (2011). Advancements in shipbuilding, and increased efforts by European powers to build naval fleets, eventually made it difficult for Barbary pirates to control the Mediterranean Sea successfully. This challenge contributed to the eventual downfall of the control of the Ottoman empire in North Africa; the British, French, Italian, and Spanish empires took control over several Berber and Ottoman states in the 18th and 19th centuries, adding to expansive empires these powers were building in sub-Saharan Africa.

3.2 European Colonization of Africa

At the turn of the 15th century, most European governments focused on overcoming the economic downturn resulting from large-scale population loss during the bubonic plague pandemic known as the Black Death. In Portugal, the economic consequences of the plague included the collapse of many rural agricultural communities as struggling farmers moved to the coast or emigrated from the country (Newitt 2005). Those that moved to the coast most often became merchants and fishermen; while the illness was not absent at sea, many saw naval work as a safer alternative to village life during the plague. To capitalize on the migration of Portuguese individuals to the coast, King Alphonso IV of Portugal granted state funding to shipbuilders to create the nation's first full commercial fleet (Paul 1999). This commercial fleet added to the Portuguese's extensive naval fleet, established initially to defend Portuguese merchants from the Barbary pirates in the strait of Gibraltar. The naval and commercial fleets embarked on several exploratory expeditions beginning in the early 1400s under the direction of Prince Henry the Navigator.

3.2.1 Pirates, Priests, and Trade

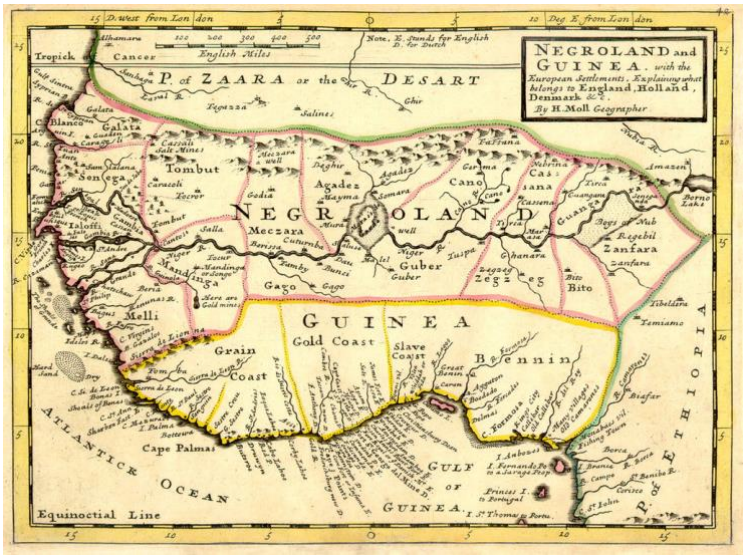
Under Prince Henry's direction, the Portuguese undertook several exploratory expeditions. Prince Henry aimed to accomplish three objectives when sanctioning these expeditions. First and foremost, the expeditions aimed to establish an alternative sailing route to South Asia. The Portuguese wanted to avoid the Mediterranean, when possible, to prevent enslavement and raids at the hands of the Barbary pirates and the Berber navy. The fear the Barbary raids instilled in European powers was fundamental to the history of Africa's colonization as it forced the Portuguese to begin sailing south along the western coast of Africa. However, establishing a route to circumvent the African continent would take the Portuguese nearly a century. Vasco de Gama would not reach India, Portugal's primary trade destination in South Asia, until 1498.

As such, the Portuguese exploratory expeditions had two secondary goals. Motivated by the rumor of extensive stores of gold along the African coast, the Portuguese worked to establish trading posts and colonies during their expeditions. Doing so would allow the Portuguese to centralize trade and capitalize on Africa's natural resource wealth, making Portugal incredibly rich. This mission was accomplished quickly; the Portuguese took over Madeira in 1420 and established a plantation colony. The second goal of these expeditions was to spread Christianity. Portugal, a devoutly Catholic Country, committed to spreading Christianity throughout their expeditions. Two papal bulls, Dum Diversas in 1952 and Romanus Pontifex in 1455, granted Portugal the exclusive right to trade in newly discovered lands.

The Portuguese exercised this right extensively and established their first African trade post in 1445, in modern-day Mauritania, where cloth and wheat were sold in exchange for enslaved people used to populate the plantation colony on Madeira (Russel-Wood 1998). Further exploration led to establishment of military posts and trading ports along the western coast of Africa. Between 1444 and 1447, Portuguese sailors established trade in modern-day Senegal, Guinea, and The Gambia. Cape Verde and Sierra Leone were colonized in 1456 and 1462, respectively. Throughout the 1470s, the Portuguese established trading ports in Ghana, Cameroon, Benin, Togo, and Angola (Russel-Wood 1998). Through these ports, the Portuguese traded extensively; gold, textiles, and minerals were transported to Europe in large numbers. The most lucrative component of trade, however, was human capital. The Portuguese built slave markets throughout the ports of western Africa, formally starting the Transatlantic slave trade.

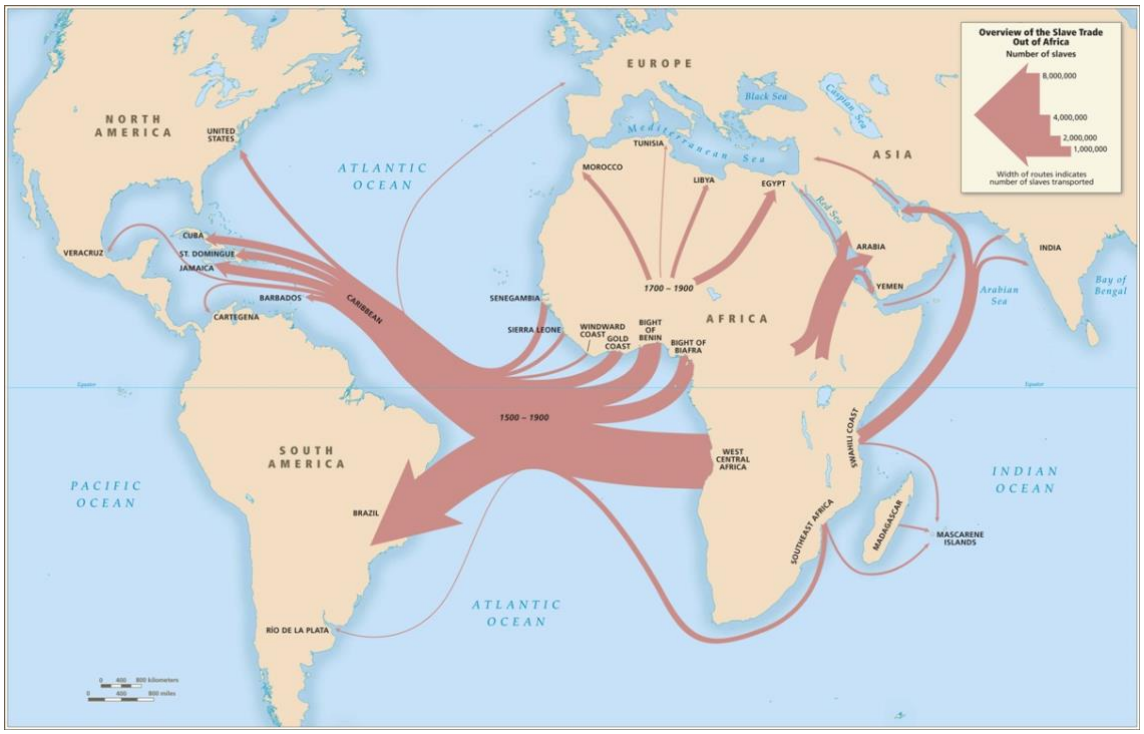
3.2.2 Royal Charter Companies and the Ports of the Transatlantic Slave Trade

Between the 15th and 17th centuries, the Portuguese dominated the slave trade. Under the papal bulls decreed by the Catholic Church, only the Portuguese could purchase enslaved people directly from African kingdoms, as Portugal was granted the exclusive rights to trade. While some enslaved individuals were transported to Europe, most enslaved people purchased by the Portuguese were sent to plantation colonies on Madeira and Cape Verde or sold to the Spanish and transported to plantation colonies in the Caribbean. Other European empires refuted this claim but initially struggled to establish ports along the western coast of Africa. In order to benefit from the slave trade economically, many other European empires resorted to capturing Portuguese ships and claiming enslaved passengers as their own. The Dutch empire eventually established their trading ports and slave markets, sixteen in total. The Dutch overtook the Portuguese's position as the predominant slave traders in the Atlantic during the 1600s. The Dutch ports and markets were so successful that portions of the western coast of Africa were coined the Dutch Slave Coast and the Dutch Gold Coast, as indicated in Map 1. Later, both the English and French empires were able to build their ports and markets, further expanding the transatlantic slave trade into the 18th century.



Map 1: Map of Dutch and English settlements on the Gold Coast and Slave Coast
Source: Herman Moll (1729)

Two forces drove this expansion; demand for enslaved people increased significantly as the Spanish and British built plantation colonies in North and Central America. In response, the creation of royal charter companies allowed European countries to use government funds to build large trading ports and transport enslaved people across the Atlantic. The British Royal African Company, the Dutch West Indies Company, the Dutch East Indies Company, and the Portuguese Guinea Company were among the most prominent companies involved in the transatlantic slave trade. These companies often built large central ports as headquarters or merchant bases, which became centers for economic activity. The significance of these ports is underscored by Map 2, which illustrates the location and scale of the slave markets from which most enslaved Africans left the continent.



Map 2: Locations and volume of the slave trade out of Africa from 1500 – 1900
Source: Eltis and Richardson (2010)

The trade of enslaved people was highly profitable. It is estimated that in the 1680s, the Royal African Company saw an average profit of 38% per transatlantic voyage (Rice 2008). The Dutch Research Council reported that in 1770, the transatlantic slave trade alone accounted for 5.2% of the empire's gross domestic product (2019). This high profitability continuously motivated European powers to follow the lead of the Portuguese empire and establish trading ports and colonies throughout the African coast so long as the slave trade continued. When slavery was abolished, however, European motivation for colonizing Africa did not halt.

3.2.3 The Berlin Conference and the Scramble for Africa

Slavery was outlawed throughout Europe and North America in the 1800s, forcing European empires to identify other means of lucrative trade. Seeking to increase trade and build strategic military bases, the French, Spanish, Portuguese, British, and German empires expanded further into the coastal regions of Africa throughout the 19th century. This time is known as the Scramble for Africa, marked by extensive efforts on behalf of European empires to colonize the continent through any means necessary. The mission of these empires' actions in Africa shifted towards the end of the century; the 1870s and 1880s saw several European empires begin to expand inland in search of natural resources and new markets. Much of this expansion was done in the "name of development," driven by the "White Man's Burden" notion central to many imperialism and colonialism projects (Cowie 1982). Naturally, expansion created conflict amongst empires as they competed for

land, particularly between the British and French in West Africa; Egypt, the Portuguese, and British in East Africa; and the French and King Leopold II (King of the Belgians) in central Africa" (Heath 2022). In response to this conflict, the First Chancellor of Germany, Otto von Bismarck, called for a meeting of European and American representatives to discuss the division of African lands. This meeting was known as the Berlin Conference.

The Berlin Conference began on November 15, 1984, and finished with the signing of a collective agreement on February 26, 1885. Representatives from Germany, Austria-Hungary, Belgium, Spain, Denmark, France, the United Kingdom, Italy, the Netherlands, Portugal, Sweden-Norway, Russia, the Ottoman Empire, and the United States attended the conference. For many historians, the conference is the starting point of the formalization of Africa's colonization. After much deliberation, the Berlin Act was signed. The Berlin Act established the region in which it was determined that a particular empire could "pursue legal ownership of land" (Craven 2015). The agreement also established boundaries of free trade, detailed plans to abolish slavery, and outlined protocols for land possession under the principle of effective occupation. This principle determined the conditions under which land could be considered in an empire's ownership. It is important to note that neither the principle of effective occupation nor the treaty at large prohibited the procurement of lands through force. In the years following the Berlin Conference, hostile takeovers of African lands were commonplace. By 1900, it is estimated that 90% of the continent had been colonized, as shown in Map 3.

Map 3: Progression of the colonization of Africa from 1878 to 1914
Source: Facing History (2022)

Once established, colonizers were motivated to retain their colonies for political and economic gain. Colonizers were particularly interested in the economic benefits of maintaining their colonies, according to Khapoya (1998). He states that along with political advantage, maintaining African colonies allowed colonizers to grow cash crops, exploit cheap and forced labor, and promote further use of natural resources for European industrial means. Maintaining colonies with coastal ports allowed colonizers to retain control over maritime trade in and out of their colonies.

World War I and the Great Depression, however, complicated the colonizer's abilities to maintain their colonies. Increased pressure for raw materials during the war led to many empires establishing more direct economic control in their colonies; open trade between

colonies on opposing sides of the war was rare (Craven 2015). Increased pressure on colonial economies resulted in harsher labor conditions, which, coupled with racial tensions, rising nationalism, and growing resistance against colonial rule, began to lay the groundwork for later independence movements. These movements, also known as decolonization movements, were fully realized in large numbers following World War II.

3.3 World War II, Decolonization, and Independence

Pressure and resistance mounting against colonizers following World War I only increased throughout WWII. European empires on both sides of the war relied heavily on their African colonies for natural and human resources; over 1.3 million African soldiers were conscripted to fight in WWII. Africa's involvement in the war is thought to have directly contributed to the growing desire for self-rule in African colonies (Killingray and Plaut 2010). This desire was bolstered by the release of the Atlantic Charter in 1941, which outlined the United States and the United Kingdom's plans for a post-war world. The charter specifically stated that countries would have the right to form governments and operate under self-rule. The Atlantic Charter was not ratified; it inspired hope in African colonies but made no formal promises (Reeves 2017). At the end of the war, the Prime Minister of the United Kingdom, Winston Churchill, and the President of the United States, Franklin D. Roosevelt, famously disagreed on the clause's application. Roosevelt believed that the clause applied to all countries of the world. Churchill believed the clause only applied to "the States and Nations of Europe now under the Nazi yoke" (Reeves 2017). French politicians upheld this belief, and rather than being granted independence after WWII, African colonies continued to face economic exploitation and conflict, but resistance prevailed.

3.3.1 Violent Conflict over Independence

Europe's economic resources were largely depleted during the war. Widespread destruction from the conflict forced governments to stretch their limited resources thinly, creating opportunities for African colonies to capitalize on growing decolonial movements, though not without cost. Incidents of physical oppression and violence rose after WWII, and many colonial powers resorted to force, initially preventing their colonies from gaining independence. Algeria is the most well-known example of this colonial strategy. In the 1945 Sétif and Guelma massacre, the French military killed at least 6,000 Algerians after political uprisings called for the removal of French colonial rule. The death toll is believed to be underreported; some historians argue that an estimated 20,000 dead is appropriately conservative (Peyroulou 2008). Violent conflict over Algerian independence escalated to such an extent that the Algerian War for independence saw 1.5 million Algerians killed, as reported by the Algerian government. The French government only claims responsibility for 350,000 deaths (Wantchékon and García-Ponce 2014). Algeria was eventually granted independence in 1962 following eight years of violent conflict.

Violent conflict over independence is not unique to Algeria. The French killed approximately 89,000 Malagasy in 1947 during an independence uprising in Madagascar. Years of guerilla warfare and military suppression of riots led to a war between Cameroon and France in 1959 (Wantchékon and García-Ponce 2014). Between 60,000 and 75,000 civilians were killed during the Bamileke war. Cameroon was granted independence in 1960. Colonies under British and Portuguese rule also experienced extensive military violence. British colonial police killed three Ghanaian veterans during a peaceful protest in 1948, leading to riots and public outcry until Ghana's independence in 1957. Kenyan demands for independence led to the Mau Mau uprising from 1952 to Kenya's

independence in 1960. Demographer John Blacker estimates that the conflict resulted in 50,000 deaths (2007). From the 1950s to the mid-1970s, Portugal used military force to combat independence movements in Cape Verde and during the War of Liberation against Mozambique, Guinea-Bissau, and Angola. Due to the geographic expanse of warfare and the guerilla warfare tactics used on both sides, the death tolls of this these conflicts are unknown.

3.3.2 Non-Violent Independence in the 1960s

Several African colonies were granted independence through non-violent negotiations following the 1960 United Nations Declaration on the Granting of Independence to Colonial Countries and Peoples. The declaration listed seven decrees outlining the status of self-determination as a human right. Further, the declaration stated explicitly that "inadequacy of political, economic, social or educational preparedness should never serve as a pretext for delaying independence," which directly countered the justification for colonization adopted by the United Kingdom and France (United Nations General Assembly 1960). Under this declaration, all military action preventing independence must cease, and all power must be transferred from colonizer to colony immediately. In response, thirty-five colonies gained independence between 1960 and 1970, joining the nine African countries already granted independence. Despite the declaration, Portugal, France, Spain, and Britain maintained colonies after 1970. Zimbabwe, the last African colony to gain independence from a European power, was granted independence from Britain in 1980.

Chapter Four: Study Mechanisms

Mechanisms are potential causal explanations for an observed research outcome. In this study, mechanisms include any factor that may explain an observed effect of colonial history on the trade relationships of African countries. Mechanism testing allows researchers to provide or refute possible explanations for the effects they observe in research results. Mechanism testing in this study is also advantageous as it requires using alternative model specifications, which serve as robustness checks, and indicates opportunities for future research. A review of the empirical literature and historical analysis are used to identify potential mechanisms, later used in Models 2 and 4. This chapter describes and justifies all mechanisms tested.

4.1 Cultural Mechanisms

Previous empirical studies (Rose and van Wincoop 2001; Wei 1996; Hummels et al. 2001; Eaton and Kortum 2002) indicate that shared language between country pairs has a significant, positive impact on trade through the reduction of trade barriers and creation of preferential bias. Shared language is common in country pairs with shared colonial history. Historically, colonizers insisted on the use of their native language, often going as far as banning indigenous languages within African colonies (Shakib 2011). Over 330,000 observations in this study indicate a shared official language between countries within a country pair. Given the prevalence of shared language in the data and the well-documented impact of shared language on trade, it is justifiable to include it as a possible explanation for any impact found in the analysis.

Shared religion is also believed to have a significant impact on trade, as found by Lewer and Berg (2007) and Mehanna (2003). Unlike shared language, the impact of religion on trade is said to have both positive and negative effects, depending on the religion. Religion is also important in studies related to colonial history because it served as a primary motivation for colonial projects, particularly for the Portuguese empire in early colonial history. The conversion of African individuals to Christianity was a priority for the Portuguese, facilitating some of the inward expansion of colonialism in Africa. Shared religion is prevalent in the country pairs studied; a summary of the variable capturing country pairs that share a majority religion indicates that the majority religion is shared in 545,000 observations of the dataset used. Thus, it is important to include common religion as a mechanism for any found effect in the analysis.

4.2 Resource-Rich Countries

Inclusion of resource-rich countries as a mechanism in this analysis is motivated by the study's historical context. In addition to spreading religion, the Portuguese ventured south, searching for rumoured stores of gold. Later, trade expanded to include other natural resources, including ivory, rubber, oil, palm oil, wood, and cotton. Colonizers were motivated to trade with kingdoms and colonies that possessed the materials Europeans wanted; being resource-rich likely impacted trade positively. This idea is supported by traditional trade theory, which states that the resource composition of a country often determines trade specialization, which impacts international trade overall (World Trade Organization 2010). It is possible, then, that countries with high stores of natural resources and historically

resource-rich countries would trade more than countries with limited resources. The same can be said for countries containing colonial ports.

4.3 Port Mechanisms

The presence of ports may also explain any found impact of colonial history on trade relationships. Europeans initially established their presence in Africa through the creation of ports to aid in colonial trade and exploratory expeditions. These ports became centers of economic activity and have remained as such. Historically, and at present, maritime shipping dominates trade between Europe and Africa. Thus, it is logical to assume that the presence of colonial ports in a country may impact trade flows, as they are how trade was conducted for centuries. The impact of ports on trade is well documented. Mlambo (2021) and Njinkeu et al. (2008) find that port performance positively impacts trade. Dwarakish and Salim (2015) note that ports are a primary determinant of trade behaviour, with increased roles in developing coastal areas. Hidalgo and Ducret (2017) use shipping trade data from 1880-2016 to show that historical ports, ports established and expanded during colonization, have been the predominant sites of shipping activity throughout the period of study. Colonial ports clearly impact trade and cannot be ignored in mechanism testing. Categorization of port types in colonial Africa into separate mechanism variables for testing is necessary as different port types support different causal narratives. The four port types included in this study are described in Table 1.

Table 1: Descriptions of Port Types

Port Type	Description
Transatlantic Slave Trade	All ports involved directly in the Transatlantic Slave Trade is included in this category.
Slave Exporting	This category includes all countries with ports from which Europeans exported enslaved peoples. In addition to the ports central to the Transatlantic Slave Trade, this category includes ports in Eastern Africa where Europeans exported enslaved Africans to India and the Arab empires.
Colonial Base	Ports in this category functioned both as economic centers and military or political bases for colonizers.
Trading and Charter Company Headquarters (HQ)	Ports that were the headquarters of royal charter companies and large, European trading companies are included in this category.

The slave trade was another primary motivator of colonization in Africa; several European countries began sailing to and establishing ports in Africa to partake in the lucrative trade of enslaved peoples. The slave trade is known to have an economic impact on trade, though this impact likely differs during colonization and after independence. During colonization, the high profitability of the slave trade drove the colonial expansion

throughout Africa and bolstered European economies (Saupin 2020). Demand for enslaved people also created new trade routes, incentivizing European empires to sail to new destinations across the Atlantic and expanding trade as a result. After independence, the slave trade has been found to have negative long-term consequences on economic development and trust within Africa, which may impact trade behavior (Nunn 2008; 2011). In the case of both a positive and negative impact of colonial history on trade, ports central to the slave trade may explain results and are thus necessary for mechanism testing.

Including ports that served as the political, military, or trading base of colonial powers or chartered trading companies is also necessary. Saupin (2020) notes that "the presence of an administrative and military headquarters of a company enjoying a national monopoly had a significant impact" on the economic landscape of Africa. These ports are essential in Model 4, which tests the impact of colonial ties after independence. After independence, the trading companies and colonial powers would no longer occupy these ports, which may negatively impact trading activity and port efficiency. During colonization, these ports may have positively impacted trade, as Saupin (2020) noted.

4.4 Empire Identity

The final mechanism tested in this analysis is empire identity. In previous empirical studies, empire identity does not significantly affect trade flows (Mitchener and Weidenmier 2008; de Sousa and Lochard 2012); Tadei 2021). However, factors related to empire identity, such as the conflict in independence movements, have been shown to impact trade relationships between country pairs sharing colonial history (Head et al. 2011). In the interest of contributing to the body of literature on trade and colonial history, it is useful to include empire identity as a mechanism in this study to compare results with previous literature to see if past results are upheld when the period of study is extended. Further, including empire identity mechanisms allows the researcher to test alternative specifications of Models 2 and 4, increasing model robustness.

Chapter Five: Data and Variable Sources

To test the impact of colonial history on trade relationships, and the mechanisms potentially explaining any found impact, several types of data are required. This chapter outlines the data sources and collection methods used in this study. Summary statistics of the data used are available in Appendix 1.

5.1 CEPII Gravity Dataset

Most data used in this study is sourced from the CEPII Gravity Dataset compiled by Conte, Cotterlaz, and Mayer in 2021. The dataset was compiled to gather "a set of variables useful to researchers or practitioners willing to understand the determinants of international trade" (Conte, Cotterlaz, and Mayer 2021). The dataset includes several primary and secondary sources of data, including the IMF direction of trade statistics and World Bank development indicators used in Head et al. (2011). Bilateral trade data in the dataset is coded by country pair, between 252 countries from 1948 to 2019, totalling 3.4 million observations. When the data is restricted to only include African countries and their trading partners, observations are cut to 1.7 million across 23, 868 unique country pairs.

The CEPII gravity dataset was an appropriate choice for this study for several reasons. Data is organized and compiled for the purpose of international trade analysis. As such, the data effectively collects information on trade, demographics, colonial history, national statistics, and other cultural and historical factors. The wide range of variables in the dataset allows for more stringent model specification, as there are more independent and control variables to consider. Further, the size of the dataset allows for variation in the model, lending additional robustness to econometric analysis conducted in the following chapters. Finally, the large time frame covered in the dataset allows for updated analysis; this is significant to this study's aim to contribute to current literature using updated data, as noted in Chapter Two.

5.2 Harvard Colonial Dates Database (COLDAT)

Historical data on the colonial relationships of African countries is necessary for analysis of both colonial relationships and empire identity in this analysis. Data from the Harvard Colonial Dates Database (COLDAT) was used to construct dummy variables capturing independence, colonial relationships, and empire identity across country pairs. The dataset was compiled by Bastian (2019) from multiple secondary sources to "reflect the accumulated knowledge in the discipline." This dataset was chosen, as opposed to any one of the secondary source historical datasets themselves, because it contains information about every country colonized throughout history and has undergone multiple accuracy checks through cross-referencing. Bastian (2019) notes that in the past, historical dataset choice has been difficult to justify; in compiling several secondary sources, Bastian is able to run several checks to confirm historical dates, easing this justification and increasing the quality of the data reported.

5.3 Researcher Collected Data

Borrowing Bastian's method, secondary sources were used to compile historical data related to the presence and categorization of ports. Secondary sources used include historical studies on the emergence of port towns (Saupin 2020), slave trade on the eastern coast of Africa (Vernet 2009), and the history of the slave coast and its ports (Law and Mann 1999; Law 2005). Data was cross-checked and referenced through comparison of these sources internally and externally, against the historical accounts presented by the Slave Voyages project, a database sponsored by the US National Endowment for the Humanities that compiles historical data on the slave trade from collaborative research in Africa, North America, and Europe. Data used to construct port variables was also sourced, and cross-checked, using Eltis and Richardson's Atlas of the Transatlantic Slave Trade (2015) which visually illustrated slave trade data through mapping. These variables, and the variables mentioned above, are used throughout the econometric analysis models in the following chapters.

Chapter Six: Initial Regression Analysis

The ordinary least squares (OLS) estimation method was applied to a linear regression model with two-way fixed effects in an initial analysis of the impact of colonial ties on trade relationships.

6.1 Econometric Specification of Model 1

The two-way fixed effects linear regression model utilized in the initial analysis is as follows:

$$\begin{aligned}\ln(trade)_{ijt} = {} & \beta_0 + \beta_1 \ln(trade)_{ij(t-1)} + \beta_2 \ln(gdp)_{i(t-1)} + \beta_3 \ln(gdp)_{j(t-1)} \\ & + \beta_4 \ln(pop)_{i(t-1)} + \beta_4 \ln(pop)_{i(t-1)} + \beta_5 \ln(pop)_{j(t-1)} \\ & + +\beta_6 (col\_dep)_{ij(t-1)} + \beta_7 (rta)_{ijt} + \alpha_{ij} + \delta_t + \mu_{ijt}\end{aligned}$$

6.2 Included Variables

The primary variable of concern in this analysis is the variable capturing trade relationships. This study's dependent variable is the natural log of trade flows reported by the IMF. This variable was chosen to capture trade relationships because it reflects the behavior of country pairs, is sourced from a reputable organization, and includes the most complete trade data of all trade variables in the CEPII dataset. Trade flow data from the International Monetary Fund was also used by Head et al. (2011). This variable was log-transformed to capture the relative change in trade relationships and account for potential skewness in the trade data.

Table 2: Dependent Variables in Model 1

Variable Name	Description
$\ln(trade)_{itj}$	the natural log of trade flows between countries i and j at time t

All non-dummy independent variables in this specification are similarly log transformed to capture the relative change in trade relationships and account for potential skewness in the trade data. All time-variant independent variables were also lagged by one year. Lags are necessary for this specification because trade flows in the observed year depend on the trade flows, gross domestic product (GDP), and populations in the previous year. The variable col_dep is lagged to capture the impact of being in an active colonial relationship in the year before observation. The variable rta is not lagged as the current presence of a regional trade agreement between countries in a given year would impact trade flows in that same year. All variables are described in Table 3.

Table 3: Independent Variables in Model 1

Variable	Description
$\ln(trade)_{ij(t-1)}$	The natural log of trade flows between countries i and j at time t, lagged one year
$\ln(gdp)_{i(t-1)}$	The natural log of country i's GDP, lagged one year
$\ln(gdp)_{j(t-1)}$	The natural log of country j's GDP, lagged one year
$\ln(pop)_{i(t-1)}$	The natural log of country i's population, lagged one year
$\ln(pop)_{j(t-1)}$	The natural log of country i's population, lagged one year
$(col\_dep)_{ij(t-1)}$	Dummy variable indicating the existence of a colonial or dependent relationship between countries i and j at time t
$(rta)_{ijt}$	Dummy variable indicating the existence of a regional trade agreement between countries i and j at time t

Additional terms specified are defined in Table 4.

Table 4: Fixed Effects and Error Term in Model 1

Term in Specification	Description
α_{ij}	Country pair fixed effects
δ_t	Time fixed effects
μ_{ijt}	Model error term

6.3 Model Methodology

Two-way fixed effects linear regression methodology was chosen for model specification and OLS estimation because it is a standard method used to estimate causal impacts in panel data studies across social science disciplines (Imai and Kim 2020). The methodology also works to account for the endogeneity and omitted variable issues inherent to trade data. In addition to two-way fixed effects, standard errors in all models are clustered to fit the panel data best, as data is reported at the country pair level.

6.3.1 Inclusion of Fixed Effects

Trade data is notoriously endogenous; choice is inherent to trade policy and behavior. Endogeneity occurs when an explanatory variable correlates with the error term, violating a principal assumption of the OLS method. Violation of this assumption results in biased estimates. Endogeneity in estimation is often addressed using the Instrumental Variables method (IV), which involves using an exogenous variable, a variable uncorrelated with the error term, in the place of the endogenous variable. Robust instruments produce the most reliable results and must be both exogenous and strongly correlated with the endogenous variable in question. IV regressions, in the case of the studies on trade, have not been consistently successful in eliminating issues of endogeneity. Baier and Bergstrand (2009) note that previous studies have reported "at best, mixed evidence" on the success of this method.

In addition to endogeneity, trade data is impacted by unobservable variables; this is particularly true in the case of trade barriers. As noted by van Bergeijk and Brakman (2010), trade barriers are difficult both to observe and capture as they are often unseen. Some observable barriers to trade, such as border walls or geographical features like mountain ranges, are difficult to quantify appropriately. Trade barriers exist both bilaterally and multilaterally. Multilateral trade barriers are trade barriers countries face across trading partners, separate from the barriers to trade in any bilateral relationship. Failure to account for both MRTs and bilateral barriers to trade results in omitted variable bias, and thus, unreliable estimate results. This occurs because "bilateral trade between any country pair is affected by both trading partners' interactions with the rest of the world" (de Bruyne et al. 2013). To account for this potential omitted variable bias, and the endogeneity inherent to trade data, all models in this analysis include two-way fixed effects.

Fixed effects are used in panel data analysis to control for any unobservable variables. This study's models include country pair and time-fixed effects. Country pair fixed effects specifically control for time-invariant, unobservable variables that may directly impact trade flows between a specific country pair. These unobservable variables include cultural, historical, and political factors, which Chang and Wall (2005) note are difficult to capture quantitatively. Time-invariant dummy variables, such as the col_dep and $common\_religion$ variables in this analysis, can be used to capture some of this information; variables of this kind, however, cannot be used in a fixed effect model as they do not change over time and will be omitted when the regression is run. Distance will also be omitted from a regression with country-pair fixed effects because it is time-invariant; this is important to note because literature, particularly on the gravity model, indicates that distance negatively impacts trade flows. Despite this, several authors argue that country-pair fixed effects are the most appropriate way to address potential endogeneity and omitted variable bias in trade data, including Chang and Wall (2005), Agnosteva et al. (2019), Egger and Nigai (2015).

Alternatively, "time-fixed effects allow controlling for observable and unobservable systematic differences between observed time units" (Gösser and Moshgbar 2020). In other words, time-fixed effects account for variables that are constant across country pairs, vary over time, and impact trade flows. Examples of this kind of variable include macroeconomic shocks, global recessions, and improvements to technology that impact trade, such as shipping or transit improvements. Time-fixed effects are necessary to avoid omitted variable bias and account for bilateral and multilateral trade barriers and have been used in several trade studies to account for omitted variable bias, including Head and Reis (2010), Sun and Reed (2010), Larch et al. (2019) and Feyrer (2019). By including both time and country-pair fixed effects, the model specification aims to fully account for any sources

of potential omitted variable bias and endogeneity and in turn, increase the reliability of results.

6.3.2 Clustering of Standard Errors

In addition to two-way fixed effects, all standard errors in this analysis are clustered by country pair. It is appropriate to cluster standard errors when observations are related to one another or sorted into groups. In the panel data used in this study, country pairs repeat because each year is an individual observation. The country pair Senegal-France, for example, corresponds to one observation for each of the years (1948 – 2019) included in the analysis. In addition to data organization, issues of heteroskedasticity in trade data also suggest that clustered standard errors are appropriate in this analysis. Heteroskedasticity refers to situations where the variance of the random variables included in estimation is not constant. Heteroskedasticity occurs when a correlation exists between observations within a cluster (Cameron and Miller 2015); this often occurs in trade data because trade flows in the previous year impact trade flows in the current year, as noted in section 5.2 in the description of the lagged trade variable. Failure to cluster standard errors when necessary "can greatly overstate estimator precision" because reported standard errors would be smaller than clustered standard errors (Cameron and Miller 2015). Failing to cluster standard errors would result in inaccurate p-values and misreported results.

6.4 Model 1 Results

Results from Model 1 are presented in Table 5. In Model 1, all but one independent variable report highly significant results. This is unsurprising as the variables are well documented determinants of trade. Results indicate that for every 1% increase in previous year trade flows between countries i and j, trade in the year of observation increases by 0.531%. Similarly, for every 1% increase in the previous year GDPs of countries i and j, trade flows increase by 0.29% and 0.19% respectively. Regional trade agreements between countries within a pair increase trade flows by 0.24%. 1% increases in the population of country j in the previous year correspond with an increase in current year trade flows of 0.32%. Interestingly, for every 1% increase in the population of country i in the previous year, trade flows decrease by 0.098%. It is possible that an increase in population requires countries to retain more domestically produced goods to meet demand. An increase in population may also correspond with increased public spending on social services, which may detract from government investment in goods production. Both hypothetical reactions to population growth may explain this negative coefficient.

Results from Model 1 indicate no significant effect of being in a colonial relationship in the previous year on trade flows in the current year. The reported coefficient is small, and the standard error is large relative to the standard errors of other variables in analysis. This result indicates that there is no significant effect for all country pairs studied but does not provide specific information about countries impacted by the mechanisms outlined in Chapter Four. Adding an interaction term to Model 1 extends this analysis to capture any potential impact of these mechanisms on trade flows.

Table 5: Model 1 Results

	$\ln(trade)_{itj}$
$\ln(trade)_{ij(t-1)}$	0.531***
	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.294***
	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.199***
	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0971**
	(0.0342)
$\ln(pop)_{j(t-1)}$	0.322***
	(0.0340)
$(col\_dep)_{ij(t-1)}$	0.0331
	(0.219)
$(rta)_{ijt}$	0.237***
	(0.0219)
_cons	-7.094***
	(0.573)
N	283724
adj. R^2	0.835

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.5 Model 2 Specification

The two-way fixed effects linear regression model specified in Model 2 is as follows:

$$\begin{aligned}\ln(trade)_{ijt} = {} & \beta_0 + \beta_1 \ln(trade)_{ij(t-1)} + \beta_2 \ln(gdp)_{i(t-1)} \\ & + \beta_3 \ln(gdp)_{j(t-1)} \beta_4 \ln(pop)_{i(t-1)} + \beta_5 \ln(pop)_{j(t-1)} \\ & + \beta_6 (col\_dep)_{ij(t-1)} \\ & + \beta_7 (col\_dep)_{ij(t-1)} (mechanism)_{ij} + \beta_8 (mechanism)_{ij} + \beta_9 (rta)_{ijt} \\ & + \alpha_{ij} + \delta_t + \mu_{ijt}\end{aligned}$$

Model 2 includes a constructed interaction term between the lagged dummy variable capturing active colonial relationships in the year prior to observation and the mechanisms as they apply to both countries in the country pair. In this specification $mechanism_{ij}$ represents all mechanisms outlined in Chapter Four. Each mechanism is interreacted with the colonial dummy variable in a separate regression of Model 2. These regressions also function as alternative specification of the general model presented above, which serves as a robustness check of the model. All mechanism variables tested are described in Table 6.

Table 6: Mechanism Variables

Dummy Variable	Description
tst_port_{ij}	Equals 1 when a country has an African port used in the transatlantic slave trade
$slave\_exporting\_port_{ij}$	Equals 1 when a country has an African port through which Europeans exported enslaved peoples
$colonial\_base\_port_{ij}$	Equals 1 when a country has an African port used as a colonial military base or HQ
$trade\_hq\_port_{ij}$	Equals 1 when a country has an African port used as the HQ of a royal charter or trading company
$common\_language_{ij}$	Equals 1 when countries in pair share a common official language
$common\_religion_{ij}$	Equals 1 when countries in a pair share a majority religion
$resource\_rich_{ij}$	Equals 1 when at least 1 country in a pair is historically considered resource rich
$french\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by France

$belgian\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by Belgium
$german\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by Germany
$british\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by Britain
$italian\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by Italy
$spanish\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by Spain
$portuguese\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by Portugal
$dutch\_colony\_ever_{ij}$	Equals 1 if African country in pair has ever been colonized by The Netherlands

6.7 Model 2 Results

No mechanism tested reported significant results. Only two mechanisms, transatlantic slave trade ports and all ports through which Europeans exported enslaved peoples, would be considered significant if the accepted confidence interval was expanded. Results of the port mechanisms tests in Model 2 are reported in Table 7. Full results of all tested mechanisms in Model 2 are available in Appendices 2, 3, and 4. Model 2 regressions run on port mechanisms indicated significance on two types of ports at a 90% confidence level (p=0.10) but not at the widely accepted 95% confidence interval (p=0.05). The coefficients and significance levels of all independent variables, aside from the variables included in the reaction term, are consistent with the results of Model 1. The results report no significant effect of being in a colonial relationship in the previous year, and having either type of port, on trade flows in the current year. The potential significance of these mechanisms, however, do indicate that further analysis may reveal more information about this effect. Applying a more stringent regression methodology may better capture these effects and report more accurate results. As such, the Difference-in-Difference method is applied in Chapter 7.

Table 7: Model 2 Results by Port Type

	Trading Company	**Colonial Base**	**Transatlantic Slave Trade**	**Slave Exporting**
$\ln(trade)_{ij(t-1)}$	0.531***	0.531***	0.531***	0.531***
	(0.00386)	(0.00386)	(0.00386)	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.294***	0.294***	0.294***	0.294***
	(0.0129)	(0.0129)	(0.0129)	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.199***	0.199***	0.199***	0.199***
	(0.0129)	(0.0129)	(0.0129)	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0970**	-0.0971**	-0.0970**	-0.0971**
	(0.0342)	(0.0342)	(0.0342)	(0.0342)
$\ln(pop)_{j(t-1)}$	0.322***	0.322***	0.322***	0.322***
	(0.0340)	(0.0340)	(0.0340)	(0.0340)
$(col\_dep)_{ij(t-1)}$	-0.0361	0.0299	-0.0482	-0.0776
	(0.246)	(0.226)	(0.246)	(0.258)
$(rta)_{ijt}$	0.237***	0.237***	0.237***	0.237***
	(0.0219)	(0.0219)	(0.0219)	(0.0219)
$(col\_dep)_{ij(t-1)}(trade\_hq\_port)_{ij}$	0.471			
	(0.321)			
$(col\_dep)_{ij(t-1)}(colonial\_base\_port)_{ij}$		0.0985		
		(0.337)		
$(col\_dep)_{ij(t-1)}(tst\_port)_{ij}$			0.543	
			(0.290)	
$(col\_dep)_{ij(t-1)}(slave\_exporting\_port$				0.547
				(0.282)
_cons	-7.094***	-7.094***	-7.093***	-7.093***
	(0.573)	(0.573)	(0.573)	(0.573)
N	283724	283724	283724	283724
adj. R^2	0.835	0.835	0.835	0.835
Standard errors in parentheses		* p < 0.05, ** p < 0.01, *** p < 0.001		

Chapter Seven: Difference-in-Difference Regression

7.1 Econometric Specification of Model 3

A Difference-in-Difference regression model with two-way fixed effects was specified to capture the impact of colonial ties on trade relationships (indicated by changes in trade flows) before and after independence. The specification of Model 3 is as follows:

$$\begin{aligned}\ln(trade)_{ijt} = {} & \beta_0 + \beta_1 \ln(trade)_{ij(t-1)} + \beta_2 \ln(gdp)_{i(t-1)} + \beta_3 \ln(gdp)_{j(t-1)} \\ & + \beta_4 \ln(pop)_{i(t-1)} + \beta_4 \ln(pop)_{i(t-1)} + \beta_5 \ln(pop)_{j(t-1)} + \beta_6 (rta)_{ijt} \\ & + \beta_7 (col\_dep\_ever)_{ij(t)} + \beta_8 (independence)_{ij(t)} \\ & + \beta_9 (col\_dep\_ever)_{ij(t)} (independence)_{ij(t)} + \alpha_{ij} + \delta_t + \mu_{ijt}\end{aligned}$$

7.2 Additional Variables

The descriptions of Model 3 variables and terms defined in Model 1 are found in Tables 2, 3, and 4 in Chapter 6. Additional variables defined by Model 3 are described in Table 8. It is important to note that the variable capturing colonial history will be omitted in regression results of this model because it is time-invariant, and the model includes two-way fixed effects. Consistent with Models 1 and 2, non-dummy independent variables are lagged, and log transformed.

Table 8: Model 3 Additions

Variable	Description
$(col\_dep\_ever)_{ij(t)}$	Dummy value equals 1 when the countries in a country pair have ever shared a colonial relationship
$(independence)_{ij(t)}$	Variable representing independence variables described in Section 7.3.1
$(col\_dep\_ever)_{ij(t)}(independence)_{ij(t)}$	Interaction term capturing the joint effect of having a colonial relationship and fitting the characteristics of the independence variable

7.3 The Difference-in-Difference Methodology

The Difference-in-Difference (DID) regression methodology is an econometric method used to estimate causal effects, its primary advantage, in non-experimental settings. This method was chosen for its increased robustness, relative to a standard linear regression model with two-way fixed effects. DID compares "changes in outcomes over time between a population that is enrolled in a program (the treatment group) and a population that is not (the comparison or control group)" to construct a counterfactual (Fredriksson and Oliveira 2019). The method uses time-series and cross-sectional econometric techniques to evaluate the outcomes for the treatment and control groups before and after treatment. Model 3 uses DID regression methodology, in addition to two-way fixed effects and clustered standard errors, to evaluate the impact of colonial history before, and after, independence. The following sections describe the four variables used to evaluate independence as a treatment, the groups included in the study, assumptions underlying the DID model, and the adjustments made to account for these assumptions.

7.3.1 Independence Treatments

Independence serves as the treatment in this DID analysis. Kleinman (1976) and Head et al. (2011) argue that independence has a distinct effect on the trade relationships of country pairs with shared colonial history. In the case of both studies, independence had a negative impact on trade flows between such country pairs. In Model 3, the variable independence captures this treatment when interacted with the variable representing colonial history. Four separate variables were constructed by the researcher, using independence dates from the Harvard COLDAT dataset, to capture different independence circumstances. Table 9 describes the independence variables.

Table 9: Independence Variables

Variable Name	Description
$independence_{i(t)}$	Dummy variable that equals 1 when the origin country is in Africa and is independent in the observation year.
$independence_{j(t)}$	Dummy variable that equals 1 when the destination country is in Africa and is independent in the observation year.
$min\ \_independence_{ij(t)}$	Dummy variable that equals 1 when at least one country in the pair is in Africa, and the year of observation is greater than the minimum year of independence between the countries in the pair.
$max\ \_independence_{ij(t)}$	Dummy variable that equals 1 when at least one country in the pair is in Africa, and the year of observation is greater than the minimum year of independence between the countries in the pair.

It is necessary to test all four independence variables as treatments because their results capture different impacts when interacted with the colonial history variable. The origin country independence captures the impact of being an independent African country exporting to their former colonizer. The destination country independence variable captures the impact of being an independent African country importing from their former colonizer. The minimum independence variable captures the impact of at least one of the countries in the pair being an independent African country while the maximum independence variable captures the impact of one African country being independent, in country pairs with one

African country, and both countries being independent in country pairs with two African countries. Four iterations of Model 3 were run to test all independence variables with results reported in Section 7.4.

7.3.2 Treatment, Control, and the Counterfactual

To capture the impact of independence, the DID regression must have clear treatment and control groups. Country pairs in the treatment group must have shared colonial history and the colonized country must be independent in the year of observation. The control group in this DID model includes all country pairs meet two conditions. Country pairs must have shared a colonial history, as colony and colonizer, and the colonized country must not have gained independence in the year of observation. It is important to note that treatment groups must only receive treatment in the second period of study, and the control group must never receive treatment within either period of study (Fredriksson and Oliveira 2019). The treatment group in this study becomes independent but is not always independent. Directly comparing country pairs that have always been independent, with country pairs that have not bene independent in the period of study, would violate several assumptions of the DID model, noted in section 6.3.2.

Counterfactuals are another necessary component in DID models. The counterfactual in a DID model aims to capture what would have happened to the treatment group, has the group never been treated. The counterfactual Model 3 aims to capture is the trend in trade flows that would have occurred between country pairs with colonial ties, had the African country in that pair never gained independence. Counterfactuals, in addition to model assumptions, are foundational to the DID models utilization to evaluate causal relationships.

7.3.3 Assumptions of the DID Method

The primary disadvantage associated with the DID method is the necessity of validating methodology assumptions. Three main assumptions underline DID regression models. The parallel trends assumption states that if the treatment did not occur, the treatment group and control group would follow the same time trend for the outcome variable of concern (Fredriksson and Oliveira 2019). In the context of this study, the parallel trends assumption requires the data to indicate that all country pairs with colonial history would follow the same trend in trade flows, had the colonial countries in said country pairs never gained independence. Validating the parallel trends assumption is difficult, as it is not possible to know with certainty what would have occurred if independence did not occur. Fredriksson and Oliveira note that the inability to observe the counterfactual means that the assumption is "fundamentally untestable" (2019). However, properties of the control and treatment groups, the use of fixed effects, and the results from Model 1 all indicate that the parallel trends assumption is upheld.

Prior to independence, all country pairs in both the treatment and control groups share several characteristics. All country pairs in both groups include one colonized African country and a European colonizer; all country pairs additionally share colonial history. European colonizers in these country pairs vary, but as noted in section 2.2, previous literature suggests that empire identity does not have a significant impact on trade flows (Mitchener and Weidenmier 2008; Sousa 2012; Tadei 2021). Differences across country pairs, which may separate the two groups, are accounted for by the inclusion of country pair fixed effects. Time fixed effects are used in Model 3 to control for unobservable changes over time. In combination, these two-way fixed effects additionally work to reduce bias in estimation by accounting for issues of endogeneity and omitted variable bias. Further, the results of Model 1 support the parallel trends assumption as they indicate that under

colonization, the time period prior to treatment, country pairs in an active colonial relationship did not experience any significant effect on trade flows. Thus, the researcher assumes parallel trends are upheld in this DID model.

The researcher also assumes validity of the Stable Unit Treatment Value Assumption (SUTVA) and the absence of selection bias assumptions, which are foundational assumption of the DID method. Selection bias refers to the bias that occurs when there are significant differences in the characteristics between the treatment and control groups. As previously noted, both the treatment and control groups share several characteristics. Country pair fixed effects are also used to reduce selection bias as they work to account for differences across country pairs in both the control and treatment groups.

The SUTVA assumption states that "that there should be no spillover effects between the treatment and control groups, as the treatment effect would then not be identified" (Fredriksson and Oliveira 2019). Berthou and Erhart (2017) note that colonial history can result in trade spillovers. The spillover effects identified in their study are specific to the impact of colonial history on the propensity to trade similar products rather than the impact of independence on country pairs with colonial ties; independence is not cited as a source of trade spillover in current economic literature. Neither Kleinman (1976) nor (Head et al. 2011) indicate the existence of any spillover effects associated with independence. It is possible, however, that spillover effects did occur but have not been identified in previous study due to limited historical trade data, limited previous study, or unobservable qualities of said spillover effects. Additional data would be necessary to specify a model capable of testing for spillover effects associated with independence.

7.4 Model 3 Results

The results of Model 3 are presented in Table 10 on the following page. The regression results of Model 3 indicate that across all four independence variables, the significance and directionality of the lagged GDP, population, and trade variables are consistent with the results of Models 1 and 2. Similarly, the effect of having a regional trade agreement between the country pair in the year of observation remains positive and significant in all four specifications. There is, however, clear differences in the results reported across the independence variables and interaction terms. Results indicate that there is no significant effect on trade flows when the origin country is a former African colony, independent in the year of observation. This effect does not become significant in the interaction term, meaning that there is no significant effect of the origin country being an independent former African colony, even when countries have previously been in a colonial relationship. It is important to note that despite the lack of statistical significance, the directionality of coefficients reported on the origin country independence variable and interaction term mirror that of the other independence variables.

The other independence variables, outside of the interaction terms, all report positive, highly significant effects on trade. Country pairs with a formerly colonized African destination country, and no colonial ties, trade 0.286% more than countries pairs without a destination county fitting both characteristics. Similarly, country pairs with at least one former African colony, now independent in the observation year, trade 0.214% more than country pairs in which the African country is not independent. When all African countries in a country pair are independent, trade increases by 0.201% relative to trade between county pairs where this condition is not met. The positive effect of independence is reversed, however, when the independence variable is interacted with the colonial ties variable.

Independence has a negative effect on trade flows between country pairs with colonial ties. All independence variables reported a negative effect; only the destination

country independence variable reports a statistically significant effect. This indicates that the negative effect of independence is only significant when the importing country is a former African colony, and the exporting country is a former colonizer of said former colony. After independence, country pairs that fit both characteristics trade 0.285% less than country pairs in which the exporting country is or has been the colonizer of the importing country, and the importing country has not gained independence. As noted in 7.3.1, this result supports the larger extractive narrative of colonial trade. The negative direction of this coefficient indicates that once an African country becomes independent, its ex-colonizers reduce trade to their former colony, though the reason behind this effect in unclear. To identify a cause of this reduction in trade, mechanisms testing was applied to Model 3 to create an additional DID specification captured in Model 4.

Table 10: Model 3 Results	Origin	Destination	Minimum	Maximum
$\ln(trade)_{ij(t-1)}$	0.531***	0.531***	0.531***	0.531***
	(0.00386)	(0.00386)	(0.00386)	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.294***	0.292***	0.292***	0.293***
	(0.0129)	(0.0129)	(0.0129)	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.199***	0.199***	0.197***	0.198***
	(0.0129)	(0.0129)	(0.0129)	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0971**	-0.0903**	-0.0902**	-0.0941**
	(0.0342)	(0.0341)	(0.0341)	(0.0341)
$\ln(pop)_{j(t-1)}$	0.322***	0.323***	0.328***	0.325***
	(0.0341)	(0.0338)	(0.0340)	(0.0339)
$(rta)_{ijt}$	0.237***	0.236***	0.235***	0.235***
	(0.0219)	(0.0218)	(0.0219)	(0.0219)
$(independence)_{i(t)}$	0.0210			
	(0.0572)			
$(col\_dep\_ever)_{ij(t)}(independence)_{i(t)}$	-0.265			
	(0.824)			
$(independence)_{j(t)}$		0.286***		
		(0.0514)		
$(col\_dep\_ever)_{ij(t)}(independence)_{j(t)}$		-0.663*		
		(0.285)		
$(min\_independence)_{ij(t)}$			0.214***	
			(0.0439)	
$(col\_dep_{ever})_{ij(t)}(min\_independence)_{ij(t)}$			-0.515	
			(0.421)	
$(max\ \_independence)_{ij(t)}$				0.201***
				(0.0380)
$(col\_dep_{ever})_{ij(t)}(max\_independence)_{ij(t)}$				-0.500
				(0.420)
_cons	-7.103***	-7.317***	-7.360***	-7.302***
	(0.575)	(0.568)	(0.574)	(0.572)
N	283724	283724	283724	283724
adj. R^2	0.835	0.835	0.835	0.835
Standard errors in parentheses	* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$			

Chapter Eight: Explaining the Impact of Independence and Colonial Ties on Trade

8.1 Model 4 Specification

The DID regression model with two-way fixed effects used in chapter 6 was extended to include an additional interaction in Model 4. This interaction captures the effect of a tested mechanism on the previously specified treatment and control groups to analyze potential explanations for the effect reported by Model 3. The econometric specification of Model 4 is as follows:

$$\begin{aligned}\ln(trade)_{ijt} = {} & \beta_0 + \beta_1 \ln(trade)_{ij(t-1)} + \beta_2 \ln(gdp)_{i(t-1)} + \beta_3 \ln(gdp)_{j(t-1)} \\ & + \beta_4 \ln(pop)_{i(t-1)} + \beta_4 \ln(pop)_{i(t-1)} + \beta_5 \ln(pop)_{j(t-1)} + \beta_6 (rta)_{ijt} \\ & + \beta_7 (col\_dep\_ever)_{ij(t)} + \beta_8 (independence\_d)_{ij(t)} \\ & + \beta_9 (mechanism)_{ij(t)} \\ & + \beta_{10} (col\_dep\_ever)_{ij(t)} (independence\_d)_{ij(t)} \\ & + \beta_{11} (col\_dep\_ever)_{ij(t)} (mechanism)_{ij(t)} \\ & + \beta_{12} (mechanism)_{ij(t)} (independence\_d)_{ij(t)} \\ & + \beta_{10} (col\_dep\_ever)_{ij(t)} (independence)_{ij(t)} (mechanism)_{ij(t)} \alpha_{ij} \\ & + \delta_t + \mu_{ijt}\end{aligned}$$

8.2 Additional Variables

The descriptions of Model 4 variables and terms defined in Model 1 are found in Tables 2, 3, and 4 in Chapter 6. Additional variables defined by Model 4 are described in Table 11. In this specification $mechanism_{ij}$ represents all mechanisms outlined in Chapter Four. It is important to note that the variables capturing colonial history and the mechanisms, including the interaction term capturing the two, will be omitted in regression results of this model because they are time-invariant, and the model includes two-way fixed effects. Consistent with Models 1 and 2, non-dummy independent variables are lagged, and log transformed. Separate regressions were run for each individual mechanism, serving both as a test of explanation for the significant effect found in Model 3 and a robustness check of the model through alternative specification.

Table 11: Model 4 Variable Additions

Variable	Description
$(col\_dep\_ever)_{ij(t)}(mechanism)_{ij(t)}$	Interaction term capturing the effect of a country pair having colonial ties and fitting the characteristic tested by the mechanism
$(mechanism)_{ij(t)}(independence\_d)_{ij(t)}$	Interaction term capturing the effect of the destination country being a former African colony, independent in the year of observation, and fitting the characteristic tested by the mechanism
$(col\_dep\_ever)_{ij(t)}(independence)_{ij(t)}(mechanism)_{ij(t)}$	Interaction term capturing the effect of the destination country being a former African colony, independent in the year of observation, in a country pair with colonial ties, and fitting the characteristic tested by the mechanism

8.3 Model 4 Regression Results

Regression results indicate two statistically significant mechanisms specified in the iterations of Model 4. The regression tables corresponding to these mechanisms are reported in Table 12. Full regression results of all other tested mechanisms are available in appendices 5 through 8. It is important to note that the limited number of observations for former Italian, Dutch, Portuguese, Spanish and Belgian colonies resulted in the omission of all variables of interest. For this reason, the results of these empire mechanisms are not reported. The lack of statistical significance of all mechanisms implies that empire identity, shared religion, shared language, being resource rich, having a port where slaved were exported, and having a port used as a colonial base do not explain the negative impact of independence on trade flows for country pairs with colonial ties and destination countries that were African colonies.

Table 12: Model 4 Results for Transatlantic Slave Trade and Trading HQ Ports

	(1)	(2)
	Transatlantic Slave Ports	**Trading HQ Ports**
$\ln(trade)_{ij(t-1)}$	0.531***	0.531
	(0.00386)	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.292***	0.292***
	(0.0129)	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.199***	0.199***
	(0.0129)	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0897**	-0.0891**
	(0.0341)	(0.0341)
$\ln(pop)_{j(t-1)}$	0.323***	0.325***
	(0.0338)	(0.0339)
$(independence)_{j(t)}$	0.293***	0.304***
	(0.0532)	(0.0546)
$(rta)_{ijt}$	0.236***	0.236***
	(0.0219)	(0.0219)
$(col\_dep\_ever)_{ij(t)}(independence)_{j(t)}$	-0.544	-0.463
	(0.290)	(0.310)
$(tst\_port)_{ij(t)}(independence)_{j(t)}$	-0.110	
	(0.150)	
$(tst\_port)_{ij(t)}(col\_dep\_ever)_{ij(t)}(independence)_{j(t)}$	-1.357***	
	(0.407)	
$(tst\_port)_{ij(t)}(independence)_{j(t)}$		-0.153
		(0.113)
$(col\_dep\_ever)i_{j(t)}(trade\_hq\_port)_{ij(t)}(independence)_{j(t)}$		-0.963*
		(0.409)
_cons	-7.293***	-7.332***
	(0.568)	(0.568)
N	283724	283724
adj. R^2	0.835	0.835

Standard errors, clustered by country pair, in parentheses $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

The regression results of Model 4 indicate that in the case of the African countries in a country pair having either a port used in the transatlantic slave trade, or a port used as the headquarters of a trading company, the statistical significance and directionality of the lagged GDP, population, trade, and trade agreement variables are consistent with the results of all other models. For every 1% increases in the previous year GDP of countries i and j, trade flows between the country 0.292% and 0.199% respectively. For every 1% increase in last year's trade flows between the country pair, current year trade flows increase 0.531%. A 1% increase in the previous year population of country j increases trade flows. 0.323% in the regression capturing the impact of transatlantic slave trade ports and 0.325% in the regression capturing the impact of trading headquarter ports. Opposingly, a 1% increase in the previous year population of country i corresponds with a 0.0897% decrease in trade flows in regression 1 and a 0.0891% decrease in trade flows in regression 2. Country pairs with a regional trade agreement in the year of observation trade 0.236% more than country pairs without a regional trade agreement. The results of these variables are unsurprising; they are consistent with the results reported by the other study models and reflect the larger body of trade literature in which they are named determinants of trade.

The results of the interaction terms and independence variables in Model 4 are not fully consistent with the results reported in Model 3. Destination country independence, for country pairs where an African country is the destination, has a significant impact on trade flows, regardless of colonial ties. Country pairs with independent African destination countries trade more than countries without an independent African destination country; 0.293% more in regression 1 and 0.304% in regression 2. This result, in direction and significance, is consistent with the results of Model 3. In Model 4, however, all double interaction terms report no significant effect on trade flows. This means that trade flows are not impacted by the combination of any of these conditions: (1) being a country pair with an independent African destination country and colonial ties, (2) being a country pair with an independent African destination country and having an African transatlantic slave port or an African trading headquarters port or (3) being in a country pair with colonial ties and having either type of port. These results deviate from that reported by Model 3, where being an independent African destination country in a country pair with colonial ties had a statistically significant, negative impact on trade flows.

The triple interaction term in Model 4, however, captures this negative impact and reports statistically significant results, offering an explanation for the negative impact reported in the previous chapter. Results indicate that country pairs with an independent African destination country, colonial ties, and an African transatlantic slave trade port, trade 1.357% less with their former colonizer than country pairs with an independent African destination country, colonial ties, and no transatlantic slave trade port. This result narrows the applicability of the impact observed in Model 3 to countries on the western coast of Africa, where transatlantic slave ports were located. In the historical context of colonization and independence, this is a logical adjustment. From historical accounts of colonization note that ports of the transatlantic slave trade were fundamental components of colonial economies. Even after the end of slavery, these ports remained central hubs of economic activity for colonial powers. The same can be said of trading headquarter ports, where colonizers often had monopolies on trade (Saupin 2020). Results indicate that country pairs with an independent African destination country, colonial ties, and a trading headquarters port, trade 0.963% less with their former colonizer than country pairs with an independent African destination country, colonial ties, and no trading headquarters port.

History may explain this effect. After independence, ex-colonizer presence in these countries, and these ports, was significantly reduced. No longer privy to colonial trade

monopolies or advantageous colonial taxes, European companies were likely less incentivized to trade with the former colonies of their home country. It is also possible that after independence, the market demand for European goods was reduced because many colonial settlers and individuals serving in colonial militaries left Africa. Because ex-colonizers had monopolies on colonial trade, colonial trade dependencies occurred. The removal of colonial trade from these ports may have resulted in a large reduction of overall net trade, which would impact country pairs with colonial relationships as well.
Resentment towards ex-colonizers may also explain this effect, particularly for countries with transatlantic slave ports. Nunn (2008) showed that slavery caused deep levels of distrust across Africa; individuals whose ancestors were impacted by the slave trade were found to be the least trusting. It is logical, then, to believe that countries with transatlantic slave trade ports would not be exempt from this effect. It is possible that the decrease in trade between ex-colonizers and their former colonies with these ports is a result of national resentment over the violence and oppression carried out in these ports. African governments may be less inclined to form advantageous trade agreements with, or import goods from, their ex-colonizer due to damaged diplomatic relations. It is also possible that decolonial movements in former colonies pressure African governments to reduce trade integration with their ex-colonizers. In any of these cases, the reduction in trade highlights the potential for necessary policy change between these affected country pairs.

8.4 Result Relevance to Policymakers

This effect is particularly relevant to European policymakers, particularly those working in countries in the European Union (EU), which all ex-colonizers in this study, aside from the United Kingdom, are a part of. Though the coefficients of the reported effects are small, relative decreases of even 0.5% are significant when dealing with billions of dollars in goods. As noted in Section 1.3, the African market for goods is large and expanding, creating large opportunities for advantageous international trade. Until 2019, the EU was Africa's largest trading partner, now China accounts for the highest percent of African trade. The EU has made efforts to increase trade with Africa in the past decade through the implementation of trade agreements and foreign direct investment (FDI) but continues to import most of its goods from Asia. The majority of EU FDI in Africa has been invested in the Southern African Development Community, a group of 16 countries, of which two are former French colonies. Given the current trade and FDI behavior of the EU in relation to Africa, and the trade opportunities presented by the European market, it is the researchers recommendation that European policymakers increase efforts to expand trade with Africa, with a particular focus on their former colonies with ports used as trading company headquarters and ports used in the transatlantic slave trade. Doing so would allow European countries, and African countries, to benefit from expanded trade while accounting for the reductions in trade, and potentially some of the resentment, caused by colonial history.

The negative effect reported by Model 4 is also of relevance for organizations like the World Trade Organization. As mentioned in Section 1.3, a primary goal of the WTO is to help developing counties through the facilitation of global trade. It is logical then to conclude that the WTO should be concerned with both the determinants and barriers to trade as well as the diplomatic and historic relationships between countries as they apply to trade flows. The results of Model 4 indicate a negative impact of colonial history on trade from ex-colonizers into their former colonies. Colonial history, however, has not been directly addressed in the actions taken, guidelines produced, or reports published by the WTO. It is this researcher's recommendation that policymakers at the World Trade Organization make a concentrated effort to analyze and incorporate colonial history in their missions and trade

guidelines to account for the complicated dynamics of trade relationships more fully.

8.5 Study Limitations and Future Research

Challenges of data availability and model assumption testing are limitations of this study.

8.5.1 Limitations of Model Assumptions

In Section 7.3.3 on the assumptions of the DID model, the researcher assumes that both the SUTVA and parallel trends assumptions are upheld. It is noted, however, that the upholding of these assumptions is fragile in all cases of DID studies because testing for parallel trends econometrically is largely considered to be unfeasible and the spillover effects of independence are not documented in empirical literature. In the case of any study, fully capturing all spillover effects is challenging outside of a fully controlled lab environment. Further research on econometric methods to test the parallel trends assumption in the context of colonial trade would be very beneficial to future researchers and the field at large. Additionally, future research on the spillover effects related to colonial independence would allow for a more certain assumption of SUTVA validity in future studies relating to the economic impacts of colonial history.

8.5.2 Data Limitations

Future research on any of the abovementioned topics would require thorough historical data on colonial history and trade. Analysis in this study was limited by the availability and quality of historical trade data. During colonization, the recording of trade flows was conducted manually and inconsistently resulting in unbalanced trade data. This creates challenges in model testing and regression analysis and limits the initial analytical tests that can be conducted on the sample. Data limitations also require the researcher to acknowledge that reported effects only apply to the data available. In the case of this study, the statistically significant effects found in the results of Models 3 and 4 apply only to the sample used. If data were to be expanded, results may change. Just as this study aims to contribute to the literature using updated data, future research including more complete historical data, or a larger time period would contribute to the literate greatly.

Increases in the data available would also allow future researchers to implement additional mechanism testing. Head et al. (2011) report the impact of colonial ties on trade after independence has a larger negative effect for country pairs where colonies experienced violent independence events than country pairs with colonial history and non-violent independence events. Though the CEPII dataset includes a variable for conflict, the limited number of sub-samples of country pairs that experienced violent independence events meant that the mechanism could not be tested. This is not due to a lack of violent independence events, but rather, due to a lack of complete trade data observations for those country pairs; the regressions only include country pairs with reported trade flows. The same issue of limited observations impacted the empires that could be tested in Model 4. Increases in data availability would also allow for researchers to conduct a more thorough test of empire identities' impact.

In addition to data availability, the level at which data is reported indicates an opportunity for expansion in future research. It would be particularly interesting for researchers to analyze the impact of independence on trade amongst groups with colonial ties at the subnational

level, given the results of Model 4. Subnational data use would allow researchers to understand the extent to which the transatlantic slave ports, and trading headquarters ports, impacted trade in regions where the slave trade, and colonial trade, were concentrated.

Chapter 9: Conclusions

Motivated by the ever-present debate surrounding the merits and efficacy of colonialism, this research project aims to analyze the impact of colonial ties on the trade relationships of African countries using trade data from 1948 – 2019. Through updated data and mechanism testing, this study additionally aims to contribute to the body of literature on colonialism and trade and larger conversations on the unaddressed legacies of colonialism. The need for studies of this kind is underlined by discrepancies in the effect of colonial history and independence on trade found in prior study (Head et al. 2011; Rose and van Wincoop 2001; Kleinman 1976). Africa, and its trading partners were chosen as the geographical scope of this study due to the continents long and varied colonial history and the policy implications of trade in the growing African economy.

Initial, exploratory analysis was conducted using an ordinary least squares model (Model 1) with two-way fixed effects and standard errors clustered at the country pair level. Country pair and time fixed effects were used to account for model endogeneity and omitted variable bias. Results of Model 1 indicated no significant effect of being in a colonial relationship in the previous year on trade flows in the current year. This effect was upheld in Model 2, which used an interaction term to test the mechanisms identified though literature and historical analysis. In both models, however, variables related to the known determinants of trade reported unsurprising and statistically significant results.

Further analysis was conducted using a difference-in-difference model (Model 3) to analyze the impact of colonial ties on trade once former colonies had become independent. Four independence variables were generated to capture all potential causal narratives and intuitive explanations of any impact found. Results of Model 3 indicated that country pairs with a formerly colonized African destination country, and no colonial ties, trade 0.286% more than countries pairs without a destination county fitting both characteristics. Country pairs with at least one former African colony, independent in the observation year, trade 0.214% more than country pairs in which the African country is not independent. When all African countries in a country pair are independent, trade increases by 0.201% relative to trade between county pairs where this condition is not met.

The directionality of these effects reversed when the independence variables were interacted with a dummy variable capturing colonial ties. The effect was only statistically significant for country pairs with colonial ties and an importer that is an independent African country. After independence, country pairs that fit both characteristics trade 0.285% less than country pairs in which the exporting country is or has been the colonizer of the importing country, and the importing country has not gained independence. Mechanism testing in Model 4 revealed that this effect was particularly significant for countries with ports used in the transatlantic slave trade or as the headquarters of colonial trading companies. Country pairs with an independent African destination country, colonial ties, and an African transatlantic slave trade port, trade 1.357% less with their former colonizer than country pairs with an independent African destination country, colonial ties, and no transatlantic slave trade port. Similarly, country pairs with an independent African destination country, colonial ties, and a trading HQ port, trade 0.963% less with their former colonizer than country pairs with an independent African destination country, colonial ties, and no trading HQ port. The negative impacts of colonial ties on trade relationships in Africa found after independence align with the results found by Head et al. (2011).

The study acknowledges that limitations of data availability, data quality, and the strict assumptions of the difference-in-difference model apply to this research. These challenges, however, highlight several opportunities for future research on the spillovers associated with

colonial independence, historical trade data collection, and the impact of colonial ties over a larger time scale and geographic range. Opportunity exists, too, for European policymakers and the World Trade Organization whose policy decisions concern international trade. Given that results indicate a relative reduction in trade between ex-colonizers and their former colonies, the researcher recommends that European policymakers increase efforts to expand trade with Africa, with a particular focus on their former colonies. This is particularly important for the European Union, whose trade with Africa has been outpaced by trade between Africa and China, despite the growing African market for imported goods. The researcher additionally recommends that the World Trade Organization, and similar institutions, make a concentrated effort to analyze and incorporate colonial history in their work to better account for all factors impacting the already complicated dynamics of global trade.

Appendices

Appendix 1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Col_dep_ever	1491644	.005	.073	0	1
Population origin	1468648	17796.965	73338.87	3.244	1397715
Population destination	1468648	17796.965	73338.87	3.244	1397715
GDP origin	1160261	87565155	6.286e+08	8824.746	2.143e+10
GDP destination	1160261	87565155	6.286e+08	8824.746	2.143e+10
Regional Trade Agreement	1491644	.024	.153	0	1
Trade flows	369397	52237.675	437906.13	.001	48313952
Common official language	1383910	.244	.429	0	1
Common religion	1697490	.321	.467	0	1
French colony ever	1697490	.442	.497	0	1
Belgian colony ever	1697490	.063	.242	0	1
German colony ever	1697490	.166	.372	0	1
Dutch colony ever	1697490	.021	.143	0	1
Spanish colony ever	1697490	.042	.2	0	1
Italian colony ever	1697490	.063	.242	0	1
Portuguese colony ~r	1697490	.125	.33	0	1
British colony ever	1697490	.516	.5	0	1
Colonial port base	1697490	.042	.2	0	1
Transatlantic slave trade port	1697490	.226	.418	0	1
Slave exporting port	1697490	.286	.452	0	1
Trading HQ port	1697490	.083	.277	0	1
Col_dep	1491644	.001	.034	0	1
Maximum independence	1697490	.773	.419	0	1
Independent destination	1697490	.436	.496	0	1
Minimum independence	1697490	.787	.409	0	1
Independent origin	1697490	.436	.496	0	1

Appendix 2

Model 2 Results of Historic and Cultural Mechanisms

	Common Majority Religion	Resource Rich Countries	Common Official Language
$\ln(trade)_{ij(t-1)}$	0.531***	0.531***	0.532***
	(0.00386)	(0.00386)	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.294***	0.294***	0.293***
	(0.0129)	(0.0129)	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.199***	0.199***	0.199***
	(0.0129)	(0.0129)	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0971**	-0.0971**	-0.0974**
	(0.0342)	(0.0342)	(0.0342)
$\ln(pop)_{j(t-1)}$	0.322***	0.322***	0.322***
	(0.0340)	(0.0340)	(0.0340)
$(col\_dep)_{ij(t-1)}$	0.0353	-0.0296	-0.0656
	(0.229)	(0.248)	(0.622)
$(col\_dep)_{ij(t-1)}(common\_religion)_{ij}$	-0.0512		
	(0.355)		
$(rta)_{ijt}$	0.237***	0.237***	0.237***
	(0.0219)	(0.0219)	(0.0219)
$resource\_rich_{ij}$		1.267***	
		(0.135)	
$(col\_dep)_{ij(t-1)}(resource\_rich)_{ij}$		0.424	
		(0.270)	
$(col\_dep)_{ij(t-1)}(common\_language)_{ij}$			0.101
			(0.659)
_cons	-7.094***	-7.437***	-7.077***
	(0.573)	(0.573)	(0.573)
N	283724	283724	283450
adj. R^2	0.835	0.835	0.835

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 3

Model 2 Results of Empire Identity Mechanisms

	French	**Belgian**	**German**	**Dutch**
$\ln(trade)_{ij(t-1)}$	0.531*** (0.00386)	0.531*** (0.00386)	0.531*** (0.00386)	0.531*** (0.00386)
$\ln(gdp)_{i(t-1)}$	0.294*** (0.0129)	0.294*** (0.0129)	0.294*** (0.0129)	0.294*** (0.0129)
$\ln(gdp)_{j(t-1)}$	0.199*** (0.0129)	0.199*** (0.0129)	0.199*** (0.0129)	0.199*** (0.0129)
$\ln(pop)_{i(t-1)}$	-0.0971** (0.0342)	-0.0971** (0.0342)	-0.0971** (0.0342)	-0.0971** (0.0342)
$\ln(pop)_{j(t-1)}$	0.322*** (0.0340)	0.322*** (0.0340)	0.322*** (0.0340)	0.322*** (0.0340)
$(col\_dep)_{ij(t-1)}$	0.00153 (0.329)	0.0331 (0.219)	0.00724 (0.233)	0.0331 (0.219)
$(col\_dep)_{ij(t-1)}(french\_colony\_ever)_{ij}$	0.0811 (0.387)			
$(rta)_{ijt}$	0.237*** (0.0219)	0.237*** (0.0219)	0.237*** (0.0219)	0.237*** (0.0219)
$(col\_dep)_{ij(t-1)}(gerrman\_colony\_ever$			0.352 (0.230)	
_cons	-7.095*** (0.573)	-7.094*** (0.573)	-7.095*** (0.573)	-7.094*** (0.573)
N	283724	283724	283724	283724
adj. R^2	0.835	0.835	0.835	0.835

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 4

Model 2 Results of Empire Identity Mechanisms Continued

	Spanish	**Italian**	**Portuguese**	**British**
$\ln(trade)_{ij(t-1)}$	0.531***	0.531***	0.531***	0.531***
	(0.00386)	(0.00386)	(0.00386)	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.294***	0.294***	0.294***	0.294***
	(0.0129)	(0.0129)	(0.0129)	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.199***	0.199***	0.199***	0.199***
	(0.0129)	(0.0129)	(0.0129)	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0971**	-0.0971**	-0.0972**	-0.0969**
	(0.0342)	(0.0342)	(0.0342)	(0.0342)
$\ln(pop)_{j(t-1)}$	0.322***	0.322***	0.322***	0.322***
	(0.0340)	(0.0340)	(0.0340)	(0.0340)
$(col\_dep)_{ij(t-1)}$	0.0331	0.0316	-0.0293	0.349**
	(0.219)	(0.223)	(0.250)	(0.108)
$(rta)_{ijt}$	0.237***	0.237***	0.237***	0.237***
	(0.0219)	(0.0219)	(0.0219)	(0.0219)
$(col\_dep)_{ij(t-1)}(italian\_colony\_ever)_{ij}$		0.0715		
		(0.551)		
$(col\_dep)_{ij(t-1)}(portuguese\_colony\_ever)_{ij}$			0.377	
			(0.313)	
$(col\_dep)_{ij(t-1)}(british\_colony\_ever)_{ij}$				-0.490
				(0.320)
_cons	-7.094***	-7.094***	-7.093***	-7.770***
	(0.573)	(0.573)	(0.573)	(0.576)
N	283724	283724	283724	283724
adj. R^2	0.835	0.835	0.835	0.835

Clustered standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 5

Model 4 Results of Historical and Cultural Mechanisms

	Common Majority Religion	Resource Rich Countries	Common Official Language
$\ln(trade)_{ij(t-1)}$	0.531***	0.531***	0.532***
	(0.00386)	(0.00386)	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.292***	0.292***	0.292***
	(0.0129)	(0.0129)	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.199***	0.200***	0.199***
	(0.0129)	(0.0128)	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0909**	-0.0927**	-0.0898**
	(0.0341)	(0.0341)	(0.0341)
$\ln(pop)_{j(t-1)}$	0.323***	0.321***	0.323***
	(0.0338)	(0.0337)	(0.0338)
$independence_{j(t)}$	0.273***	0.214***	0.308***
	(0.0543)	(0.0537)	(0.0612)
$(independence)_{j(t)}(col\_dep\_ever)_{ij(t)}$	-0.651*	-0.559	-0.612*
	(0.286)	(0.286)	(0.293)
$(independence)_{j(t)}(common\_religion)_{ij}$	0.133		
	(0.134)		
$(rta)_{ijt}$	0.236***	0.238***	0.236***
	(0.0218)	(0.0218)	(0.0218)

$resource\_rich_{ij}$		1.275***	
		(0.129)	
$(independence)_{j(t)}(resource\_rich)_{ij(t)}$		0.508***	
		(0.135)	
$(independence)_{j(t)}(resource\_rich)_{ij(t)}$		-0.652	
$(col\_dep\_ever)_{ij(t)}$		(0.983)	
			-0.0724
$(independence)_{j(t)}(common\_language)$			
			(0.0986)
_cons	-7.307***	-7.669***	-7.307***
	(0.567)	(0.565)	(0.567)
N	283724	283724	283450
adj. R^2	0.835	0.835	0.835

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 6

Model 4 Results for British Colonies

	(1) ln_trade
$\ln(trade)_{ij(t-1)}$	0.531***
	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.292***
	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.200***
	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0905**
	(0.0341)
$\ln(pop)_{j(t-1)}$	0.324***
	(0.0337)
$independence_{j(t)}$	0.232***
	(0.0647)
$(independence)_{j(t)}(col\_dep\_ever)_{ij(t)}$	-1.480**
	(0.573)
$(independence)_{j(t)}(british\_colony\_ever)_{ij(t)}$	0.155
	(0.0908)
$(independence)_{j(t)}(col\_dep\_ever)_{ij(t)}(british\_colony\_ever)_{ij(t)}$	0.937
	(0.647)
$(rta)_{ijt}$	0.237***
	(0.0219)
_cons	-8.052***
	(0.568)
N	283724
adj. R^2	0.835

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 7

Model 4 Results for German Colonies

	(1) ln_trade
$\ln(trade)_{ij(t-1)}$	0.531***
	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.292***
	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.200***
	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0906**
	(0.0341)
$\ln(pop)_{j(t-1)}$	0.323***
	(0.0338)
$independence_{j(t)}$	0.267***
	(0.0536)
$(independence)_{j(t)}(col\_dep\_ever)_{ij(t)}$	-0.573
	(0.320)
$(independence)_{j(t)}(german\_colony\_ever)_{ij(t)}$	0.195
	(0.139)
$(independence)_{j(t)}(col\_dep\_ever)_{ij(t)}(british\_colony\_ever$	-0.572
	(0.659)
$(rta)_{ijt}$	0.237***
	(0.0218)
_cons	-7.329***
	(0.568)
N	283724
adj. R^2	0.835

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 8

Model 4 Results for French Colonies

	(1)
$\ln(trade)_{ij(t-1)}$	0.531***
	(0.00386)
$\ln(gdp)_{i(t-1)}$	0.292***
	(0.0129)
$\ln(gdp)_{j(t-1)}$	0.200***
	(0.0129)
$\ln(pop)_{i(t-1)}$	-0.0902**
	(0.0341)
$\ln(pop)_{j(t-1)}$	0.324***
	(0.0338)
$independence_{j(t)}$	0.322***
	(0.0880)
$(independence)_{j(t)}(col\_dep\_ever)_{ij(t)}$	-0.882***
	(0.245)
$(independence)_{j(t)}(french\_colony\_ever)_{ij(t)}$	-0.0493
	(0.1000)
$(independence)_{j(t)}(col\_dep\_ever)_{ij(t)}(british\_colony\_ever$	0.451
	(0.551)
$(rta)_{ijt}$	0.237***
	(0.0218)
_cons	-7.328***
	(0.565)
N	283724
adj. R^2	0.835

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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