Tariff revenues matter for democratization: Theory and evidence from the First Wave of Globalization

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Abstract

Do tariff revenues affect democratization? We argue that tariff revenues have two effects: i) A *rapacity effect* because the fiscal windfalls generate incentives for controlling government, and ii) a *redistributive effect* because tariffs impact the returns to different factors of production, changing the distribution of power among social groups. We find that the redistributive effect can either reinforce or act against the rapacity effect, depending on who benefits from the redistribution. Using data from the First Wave of Globalization, characterized by countries with predominantly landowning ruling elites, we demonstrate that in land-abundant economies, tariff revenues reduce democratization. This occurs as the rapacity effect is amplified by and complements the redistributive effect when land becomes more profitable, thereby strengthening the ruling elites. In contrast, in capital-abundant economies, the redistributive effect counteracts the rapacity effect, resulting in a statistically-inconclusive but positive link between tariff revenues and democratization.

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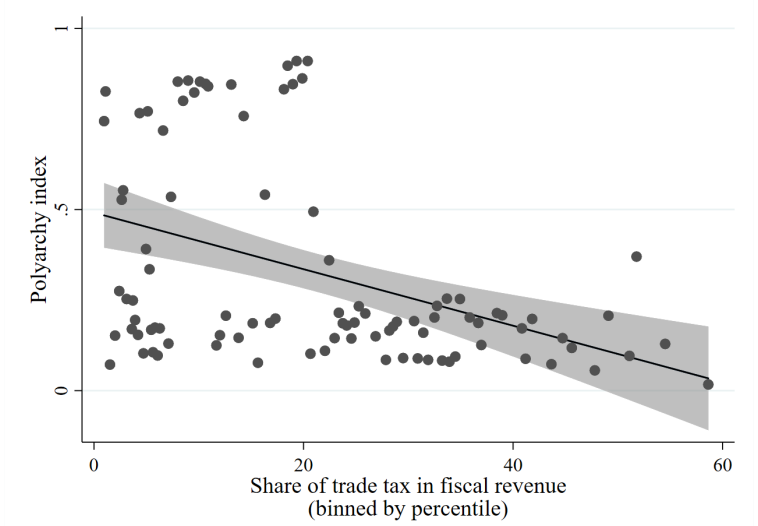
1 Introduction

The relationship between international trade and democracy has been a topic of significant interest among social scientists, but empirical studies have yielded mixed results (Milner and Mukherjee, 2009). Researchers have questioned the theoretical underpinnings behind these studies, in particular, the presumption that trade liberalization promotes democracy by equalizing income and reducing the redistributive burden for the ruling elites (Ahlquist and Wibbels, 2012). However, this perspective overlooks the role of trade as a significant source of government revenue (Gomes, 1987; Levi, 1988). For instance, countries heavily reliant on import tariff revenues tend to have less democratic governance structures (Figure 1), supporting the idea that the type of fiscal revenue is crucial for democratic development (Bastiaens and Rudra, 2018). To address these gaps, this paper introduces a new theoretical framework and empirical evidence to argue that the fiscal windfalls owing to trade are consequential to understanding the effect of trade on democratization.

Figure 1: Trade tax revenues and democracy



Note: The polyarchy index measures the extent to which the ideal of electoral democracy is achieved (Coppedge et al., 2020).

Unlike existing theories that focus solely on the extremes of autarky and free trade, where tariff revenues are negligible (e.g., Acemoglu and Robinson 2006, Ch. 10), our theory incorporates the role of tariffs in regime change. We argue that fiscal gains from tariffs can impede political competition by incentivizing key political groups to monopolize these resources rather than engage in fair redistribution. This stands in contrast to the idea that trade acts as a catalyst for democratization (Boix and Stokes, 2002). We introduce the concept of the "rapacity effect," where the desire to control both tariffs and the ensuing revenues increases, especially as trade flows grow.

Our theory also considers a "redistributive effect" arising from changes in the marginal return to different economic activities. Indeed, changes in tariffs affect the relative prices between exports and imports (i.e., the terms of trade). These shifts act on the demand for exports and import-competing goods, altering the distribution of economic power among politically-relevant groups. When a disenfranchised group experiences an increase in income relative to the ruling elite, their *de facto* power is strengthened, enabling them to challenge the ruling elite more effectively for control of the government. This dynamic can increase the likelihood of domestic conflict and regime change.

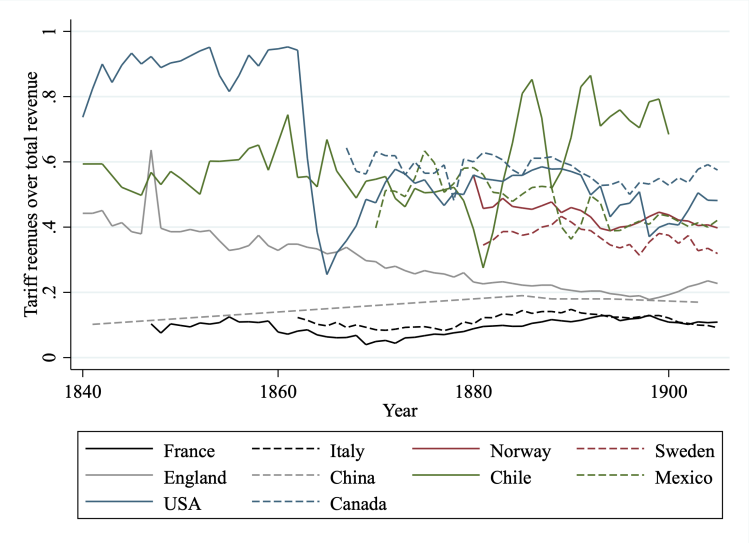
The redistributive effect can either act against or reinforce the rapacity effect. If the ruling elite is strengthened by changes in the terms of trade, they may resist sharing power, as both the rapacity and redistributive effects work against democratization. However, if a disenfranchised group gains enough from trade, the ruling elite may choose to share power in order to avoid expropriation should they lose control of the government. In this case, the redistributive effect can counteract the rapacity effect, allowing for the possibility of democratization.

A key aspect of our theory is the recognition that controlling tariff policy is also a source of power, as it can influence the distribution of benefits from changes in the terms of trade. Further, tariffs also affect the demand for traded goods, and thus tariff revenues. Therefore tariffs add to the rapacity effect, as politically relevant groups seek control over tariff policy in order to secure their interests. In this sense, this paper is the first to define the micro-foundations behind regime change as a function of both tariffs and tariff revenues.

To substantiate our claims, we examine the effect of the First Wave of Globalization on democratization. We do this for several reasons. Firstly, during this period, tariff revenues were crucial in the process of state development, as many countries had not yet developed strong fiscal states due to limited state capacity (Mazzuca, 2021; Queralt, 2021). For example, in Latin America, tariff revenues often supplied more than 50% of the total fiscal revenue (Bates, Coatsworth and Williamson, 2007), with countries like Argentina, where this income represented more than 90% of government revenues. Tariffs were also significant in the United States, England, and China, where trade taxes could account for around 20% or more of the fiscal revenue (Taussig, 1923; Levi, 1988; Ni, 2016).[1] In this regard, Figure 2 demonstrates the reliance of various countries on tariff revenues as a source of fiscal income. As Centeno (2002) notes, "tariffs were particularly attractive to the elite. They required no sacrifice, helped finance the expansion of the frontier from which the elite benefited disproportionately, and demanded few administrative resources."

[1] In Africa, in contrast, conflict over trade was limited to skirmishes between slave owners and those controlling the slave trade, with little conflict over taxation (Thornton, 1999). Dependence on taxes became relevant after African states achieved independence (Baskaran, 2013).

Figure 2: Tariff revenues over total fiscal revenues



Note: We only include countries with available data on tariff revenues and total fiscal revenues.

Secondly, tariffs and tariff revenues were pivotal in the process of institutional development during the nineteenth century. Historians have documented that landed elites (often the ruling faction) and manufacturing elites were divided on trade policy, the use of fiscal revenue, and the distribution of political power. Conflicts between these groups sometimes led to social upheaval, authoritarianism, and in some cases democratization. In Latin America, conflicts between the landed conservatives and the liberal industrialists became widespread, and they were often accompanied by authoritarianism (Centeno, 2002; Bulmer-Thomas, Coatsworth and Cortes-Conde, 2006). In the U.S. and China, disagreements over trade policy played an important role in fueling the Civil War, party politics, and the Boxer Rebellion respectively, shaping politics thereafter (Miller, 1942; Luthin, 1944; Van de Ven, 1996). In Europe—England specifically—there were social pressures to extend the franchise to the bourgeoisie and later on to workers in response to the impacts of England's international economic policy (O'Rourke, 2006).

Thirdly, this period enables us to determine the role of the redistributive and rapacity effects in democratization. To do this, we investigate the effect of an exogenous trade shock, characterized by the advent of the steam engine in the nineteenth century, which reduced transportation costs and spurred global trade, setting off the First Wave of Globalization. In fact, tariff revenues increased by about 10% per year on average during this period (Section 5).

Using data from Pascali (2017), we measure the reduction in transport costs due to this technological innovation. We exploit the quasi-exogenous variation in transportation times resulting from the shift in shipping times between sailships and steamships to estimate the causal effect of

tariff revenues on democratization and domestic conflict. Sailships were at the mercy of wind currents while steamship engines were not, allowing us to exploit variation in trade patterns that are attributable to the geographical and technological component of maritime transportation. We also find evidence that our results are unlikely to compound the effects of trade on cultural exchange or in access to foreign lending (e.g., Queralt 2021).

To evaluate the interplay between redistributive and rapacity effects, we consider a two-sector economy, with an agricultural sector and manufacturing sector, and the salient cleavage between landlords and rising manufacturing elites.[2] In land-abundant economies, landed (ruling) elites hold the comparative advantage and benefit from changes in the terms of trade due to transportation advancements. Conversely, manufacturing elites suffer as the import-competing goods are the manufactured products. Consequently, landed elites possess more resources to resist challengers and deter conflict. Thus the combined effects of higher tariff revenues and redistribution further incentivize elites to maintain power. In contrast, in capital-abundant economies, the comparative advantage is in manufacturing. Landed elites face losses due to changes in the terms of trade, as agricultural goods are the import-competing goods. This diminishes their ability to deter challengers and encourages power-sharing, counteracting the rapacity effect.

To estimate the moderating effect of being a land-abundant economy we use the relative level of caloric suitability of land between trade partners as a proxy for the comparative advantage in the agricultural sector (Galor and Özak, 2015, 2016).[3] We find that the rapacity effect is moderated by the comparative advantage: in land-abundant economies, an exogenous increase of one percent increase in tariff revenues results in a reduction of political competition by about one-third of a standard deviation, as both rapacity and redistributive effects work together against power sharing. This effect is substantial, statistically significant, and robust to various tests and measures. In contrast, for land-scarce economies (i.e., capital-abundant), the same increase exhibits a positive but statistically insignificant influence on power sharing, as the redistributive effect offsets the rapacity effect, consistent with our theoretical predictions.

These findings underscore the significance of the rapacity effect coming from controlling tariffs and their windfalls in understanding the relationship between trade and democracy. We further substantiate this claim by showing that imports generate a rapacity effect in land-abundant economies—albeit this effect is smaller vis-á-vis the effect produced by tariff revenues—and by

[2]With two sectors, an improvement in the terms of trade benefits (harms) the group with (without) the ability to produce at a lower relative opportunity cost vis-á-vis its trading partners; i.e., it benefits (harms) the group with (without) the comparative advantage because the good being produced is being exported (imported). Thus a drop in imports relative to export prices increases the demand for import-competing goods relative to exports.

[3]Relative caloric suitability captures relative land abundance (i.e., relative capital scarcity) from the perspective of land productivity (Galor and Özak, 2015, 2016).

showing that trade shocks indeed affect tariff policy. Therefore we account for the additional rapacity effect resulting from controlling tariff policy by using tariff revenues.

Lastly, we assess the impact of tariff revenues on domestic conflict. We find that a one percent increase in exogenous trade revenues leads to a robust, statistically significant decrease in the likelihood of civil conflict in land-abundant economies by 34 percentage points. Furthermore, as expected, no statistically significant effect is observed for capital-abundant economies as the redistributive and rapacity effects offset each other.

In summary, we identify a novel and substantive rapacity effect of tariffs and their associated revenues on democracy, which is conditional on the redistributive effect of tariffs. These findings contribute to a vast literature on the relationship between trade liberalization and democratization (Milner and Kubota, 2005; Lopez-Cordova and Meissner, 2008; Freeman and Quinn, 2012). Our study also contributes to the literature on redistribution and democratization (Boix, 2003; Acemoglu and Robinson, 2006; Besley and Persson, 2011; Ansell and Samuels, 2014), particularly in the context of an open economy (Rosendorff, 2001; Bastiaens and Rudra, 2018).

2 The role of tariffs in democratization

To understand the impact of tariffs on democratization we develop a model of regime change in an open economy, incorporating tariffs (see Appendix A.1 for details). In it, a group of manufacturing elites, or *challengers*, may decide to challenge a landed *ruling elite* over the control of the government in a costly conflict. Controlling the government is valuable because the ruling faction sets both the tariff policy and decides how the resources obtained from taxing trade flows are distributed. Thus as in standard models of regime change, inequality favors the ruling elite in the status quo. However, the ruling elite can extend the franchise and share power to avoid a conflict with the challengers. If this occurs, policy regarding tariffs and the distribution of tariff revenues reflect the preferences of the challengers as well, and not only those of the ruling elite.

This set-up broadly reflects the social and economic structures prevailing in developing states during the nineteenth century—the period of analysis that defines the empirical exercise herein (Section 5). For instance, historical accounts indicate that during this time period ruling elites were more likely to be landed aristocracies and powerful landlords rather than industrialists. Their challengers, in contrast, were regularly a group of rising elites tied mostly to the manufacturing sector (merchants and artisans), who often fought over the control of policy and government (Centeno, 2002; Bulmer-Thomas, Coatsworth and Cortes-Conde, 2006; Barnes, 2010). Furthermore, recent evidence shows that regime transitions have more often than not been processes led by

elites rather than the masses (Geddes, Wright and Frantz, 2014; Haggard and Kaufman, 2016), a perspective echoed in work by Higley and Burton (1989) and Ansell and Samuels (2014)—thus our setup is warranted.

In this context, tariff revenues induce a *rapacity effect*: there is an increased incentive for those in power to maintain control due to the financial gains from tariff revenues, which in turn amplifies competition and violence among potential challengers, making it less likely for power to be shared. However, this issue is complex, as trade volumes are sensitive to changes in tariff rates. Raising tariffs too much can actually backfire by diminishing the demand for traded goods, thereby reducing the overall tariff revenue (i.e., a deadweight loss).

The setting also involves a *redistributive effect*: Both the ruling elites and the challengers are involved in producing goods—primarily agricultural products for the elites and manufactures for the challengers—using land and capital.[4] Importantly, the impact of tariff policies on the prices of these goods, and subsequently on the returns to land and capital, must be considered.[5] Notably, if tariffs favor the challengers, it leads to reduced inequality. While each group may be inclined to shift the tariff burden onto the other, they must also weigh-in the effect of such tariffs on trade volumes and, consequently, on tariff revenue.

To understand better the redistributive effect, let us consider Table 1, which provides a typology on the basis of our model. A country can be land-abundant or capital-abundant (rows), and most of the land (capital) is owned by the ruling elites while most capital (land) is owned by the challengers (columns). Each cell therefore corresponds to a socioeconomic structure wherein the comparative advantage lies with either the ruling elite—upper left and bottom right cells—or with the challengers—upper right and bottom left cells.[6] In this regard, if the agricultural sector enjoys a comparative advantage, meaning that agricultural goods are being produced more efficiently than manufactures, then the former are mostly exported; the latter instead compete with imported manufactures. Hence the challengers prefer higher tariffs on imports whereas the ruling elites prefer lower tariffs (Rogowski, 1987). If instead, the economy is capital abundant and thus land scarce vis-á-vis its trading partners, the comparative advantage lies in the manufacturing sector, and thus the agricultural sector is the import-competing sector.

Since our focus for the empirical analysis is the nineteenth century, we focus on the first column of the table above. Although during this time period, ruling elites were mostly landlords, there were

[4]Higher ownership of both means of production by the ruling elites is inconsequential because the actions of the ruling elites and challengers respond to the level of inequality (Section A.1).

[5]This is a standard result of the classic Stolper-Samuelson theorem (Feenstra, 2015).

[6]In a two-sector economy the comparative advantage can only emerge in one sector (Feenstra, 2015). To study a more complex production structure is outside of the theoretic-historical scope of this paper and left for future work.

Table 1: Analytical typology

Country type	Ruling elites (challengers) own most land (capital)	Ruling elites (challengers) own most capital (land)
Land abundant	Ruling elites own the comparative advantage and export. Challengers instead compete against imports. Example: Latin America.	Challengers own the comparative advantage and export. Ruling elites instead compete against imports. Example: China.
Capital abundant	Challengers own the comparative advantage and export. Ruling elites instead compete against imports. Example: Western Europe.	Ruling elites own the comparative advantage and export. Challengers instead compete against imports. Example: post-civil-war US.

Note: Capital/land abundance is defined relative to the country's trading partners; capital (land) abundance implies a comparative advantage in the manufacturing (agricultural) sector.

variations regarding the ownership of the comparative advantage. For example, Latin American countries (e.g., Argentina, Mexico, Brazil, Colombia), were land-abundant economies with strong landed elites owing to the social hierarchies that emerged from the colonial era. As such the export of agricultural goods was particularly beneficial to these elites and trade policy reflected this fact via protective tariffs on agricultural goods (Mazzuca, 2021). In contrast, European countries (e.g., the United Kingdom, France, Italy) were capital-abundant economies, with a strong bourgeois in relation to the local (mostly landed) aristocracies. As such the manufacturing elites were more influential politically, except for the petite bourgeois, composed mostly of artisans and craftsmen.

Although it exhibited a nearly autarkic subsistence economy, China's trade policy was controlled mainly by the British after the Opium Wars (1839–42 and 1856–60). In the aftermath of the war, the British imposed treaties that weakened the Qing dynasty and the Chinese imperial government, forcing it to open treaty ports which drained the imperial economy. These wars forced the land-abundant economy to cede their ability to control over their trade policy to what were essentially manufacturing elites (Hanes and Sanello, 2002). Similarly, after the victory of the North in the US Civil War, northern manufacturing elites ensured high tariffs on imports, until they were eventually lowered when the United States was able to pay off its foreign debt (Taussig, 1923).[7] However this type of second-column-cases were infrequent.

Africa, in the context herein, is outside of the typology's scope. In colonial Africa, during the 19th century, the slave trade was still the main source of income for elites; in fact "ownership of slaves in Africa was virtually equivalent to owning land in Western Europe or China" (Thornton, 1999). The transatlantic slave trade meant that individuals were more valuable as slaves than as

[7] Tariff revenues were used to cope with increasing public expenditure (Miller, 1942).

potential taxpayers. Furthermore, ruling elites had greater incentives to carry out slave raids rather than bargaining with local elites over policy concessions. In fact, conflict over trade was limited to minor skirmishes between the elites controlling the slave trade (Reid, 2012; Bates, 2014). This is a special but uninteresting case of our theory, where there are no challengers as we define them herein because elites have the same preferences: to extract all the revenue from the slave trade.[8]

2.1 Preferences over protectionism

The decisions that both political groups take are not straightforward insofar as they must consider both the redistributive and the rapacity effect of tariffs and tariff revenues. The amount of tariff revenues that a group receives depends on the amount of political power they hold. If they control the government their dominant strategy is to consume all the fiscal revenue; conversely, if they are disenfranchised they do not receive income from trade taxes. On the other hand, tariffs cannot be zero (free-trade) nor prohibitive (autarky) because both challengers and ruling elites benefit from the fiscal revenue obtained from tariffs—we thus rule out the two standard cases in extant models of regime change in an open economy. The preferences of both ruling elites and challengers differ because whoever is not the owner of the comparative advantage benefits from higher tariffs since most of their income comes from the import-competing sector. The owner of the comparative advantage, in contrast, benefits from a (relative) subsidy on exports which is reflected by cheaper imports; i.e., an improvement in the *terms of trade*.[9] If the ruling elites share power, policy reflects the preferences of both groups, thus tariffs increase.

Figure 3 illustrates the previous point by plotting the per-capita well-being of both ruling elites and challengers as it varies with different levels of tariffs or protectionism preferences. Without loss of generality, we assume that the economy is capital-scarce and land-abundant vis-á-vis its trading partners. We also make the standard assumption that the winner of the conflict expropriates the losing side.[10] Note that each curve illustrates the utility for each political group in the potential outcomes of the game (Lemma 1 and Corollary 1 in the Appendix):

i) Status quo: If there is no rebellion, the optimal tariff policy p_E for the ruling elites is low because their relative income increases when there is an improvement in the terms of trade.

[8] Although our theory can enrich our understanding of Africa's post-colonization period (Baskaran, 2013), such analysis is outside of the scope of this paper and left for future work.

[9] The terms of trade is the relative price of exports in terms of imports and is defined as the ratio of export prices to import prices; it is the amount of imported goods an economy can purchase per unit of export goods.

[10] In Latin America, for instance, even when manufacturing elites (i.e., liberal elites) ascended to power, they did not extend the franchise to the masses. They either maintained the masses disenfranchised by means of wealth, income, and literacy requirements, locking any commitments towards egalitarian redistribution (Engerman and Sokoloff, 2005), or by means of authoritarian rule as numerous dictatorships evidence (Bethell, 1997*b*,*a*; Centeno, 2002).

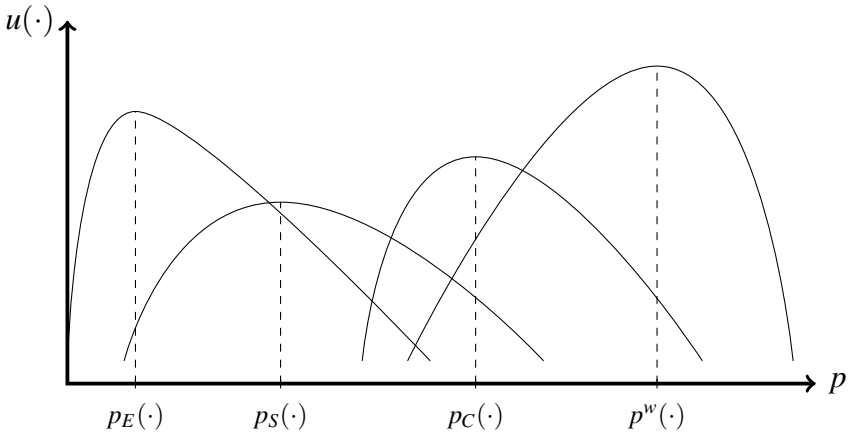
However, it is not zero because they also want to maximize the tariff revenue, considering the trade-off they face with the redistributive effect.

ii) Ruling elites lose power: If there is a rebellion and the ruling elites lose, the challengers expropriate the ruling elite, and the resulting tariff policy is the revenue-maximizing policy p^w. This occurs because after expropriating the losers, the ruling elite virtually becomes the economy's central planner.

iii) Ruling elites retain power: Similar to the previous case: if there is a rebellion and the challengers lose, the rulers expropriate the challengers, and the resulting tariff policy is the revenue-maximizing policy.

iv) Ruling elites share power: The resulting tariff policy is the social-welfare maximizing policy. Indeed, when power is shared, the resulting policy weights in the preferences of the ruling elites and challengers proportional to their group size.

Figure 3: Utility over preferences for protectionism



Note: p_E and p_C capture the optimal tariff policy choices for the elite (E) and the challengers (C) under the status quo. p_S denotes the social welfare maximizing policy under democracy (Grossman and Helpman, 1996). p^w is the standard revenue maximizing policy of a central planner. $u(\cdot)$ is an increasing and concave utility function on international prices (p). See Appendix A.1.

2.2 Regime change

The status quo can change if the challengers win their rebellion against the ruling elite, or if instead the latter decides to share power with the former (Proposition 1). If the challengers rebel, the

probability that they succeed in a rebellion depends on the level of inequality. Thus if inequality between the ruling elites and the challengers is low (high), then the likelihood of rebellion goes up (down) because they have better (worse) chances to win a costly conflict. This means that the challengers will rebel if the expected value of controlling the trade policy and the tariff revenue is higher than securing only the return to the factors of production they own. If the former value is relatively low because inequality is high, the challengers will not rebel; knowing this the ruling elite holds onto power and controls tariff policy and captures the tariff revenue. A rebellion may occur in this case only if the tariff revenue is very high.

In contrast, when the expected benefit of controlling government increases for the challengers because inequality is low, they have incentives to rebel. In this case, the ruling elites risk a rebellion that could fail when the expected value of controlling government is high enough because the trade-off between sharing power and violent conflict is substantive. As a result, a regime transition may occur when inequality falls because the trade-off between sharing power and violent conflict falls for the ruling elite since they are worse off were they to lose the conflict.

2.3 The role of trade shocks

We now investigate the effect of trade shocks on the aforementioned outcomes. In particular, we focus on trade shocks that arise from technological innovations reducing transportation costs—which is commensurate with our empirical exercise below. Importantly, these changes affect import prices and thus the demand for imports directly, and consequently tariff revenues too. They affect import prices by boosting the terms of trade. This benefits the group owning the comparative advantage because export goods become relatively cheaper abroad. They also make imported goods relatively cheaper, boosting the demand for imports, and therefore harming the group in the import-competing sector. This is the *redistributive effect* described above. Furthermore, this may provide room for tariff adjustment if the demand for imports has low sensitivity to changes in import prices. Thus tariff revenues can increase as well, strengthening the *rapacity effect*.[11]

Land abundant economies. In a land-abundant economy wherein the ruling elite owns most land, there is a positive rapacity effect emerging from the possibility of controlling the government's (bigger) fiscal revenues as well as the opportunity of controlling tariff policy. There is also a redistributive effect going in the opposite direction because the ruling elite has more room for adjusting tariffs in their favor, resulting in better terms of trade, and harming the challenger. This occurs because an improvement in the terms of trade means that the import-competing product—i.e., manufactures—becomes cheaper vis-á-vis the domestic one; the demand for local manufactures

[11] We also include a table where we classify our results using the analytical typology in Table A1.

thus drops and this reduces the challengers' income relative to that of the ruling elites. As a result, inequality increases and consequently, the probability of winning the contest falls. In this case, the challengers would only contest power when the rapacity effect dominates the redistributive effect as the redistributive effect reduces the expected value of controlling the government for them. Thus let us define the first two testable hypotheses herein:

In land-abundant countries, the effect of an increase in tariff revenues resulting from an exogenous drop in transport costs is:

> **H1.** *Power sharing **decreases** because ruling elites benefit from the improvement in the terms of trade, thus elites move to control tariff policy and the tariff revenue. Therefore the rapacity and redistributive effects go in the same direction.*
>
> **H2.** *The likelihood of domestic conflict **decreases** because elites become stronger, discouraging a challenge to their rule. Therefore the rapacity and redistributive effects go in the same direction.*

These hypotheses have historical support: In Latin America—a region made of land-abundant economies—tariffs and tariff revenues were a contentious issue during the nineteenth century. Conservatives, who were particularly represented in the landed elites, upper clergy and guild merchants, and liberals—small farmers, artisans, craftsmen, and urban working class—-had divergent trade preferences: whereas the former were favorable to old institutions, social hierarchies and protectionism in the agricultural sector, the latter pressed for free trade and building transport infrastructure to reduce transaction costs and grow exports (Bushnell and Macaulay, 1994; Bulmer-Thomas, Coatsworth and Cortes-Conde, 2006). The conflicts between the landed elites and manufacturing elites were prevalent, leading to strong-man authoritarianism in certain instances (e.g., Mexico). These conflicts were also violent, and ubiquitous and exerted strong fiscal pressures on the government. In fact, custom duties and tariffs became the primary source of state revenue (Centeno, 2002; Mazzuca, 2021).[12]

Capital abundant economies. In this case, the intuition obtained from land-abundant economies is reversed. The terms of trade improve because the ruling elites have less room for increasing tariffs optimally. This means that agricultural goods must compete with cheaper imports because the comparative advantage lies in the manufacturing sector, hence the transportation shock reduces inequality. Trade revenues, however, increase generating incentives to stay in power. In this case, the rapacity effect perceived by ruling elites is less likely to dominate in this case vis-á-vis the

[12] In China, British domination implied that tariff policy benefited the manufacturing elites vis-á-vis the (traditional) landed elites (Hanes and Sanello, 2002). In response, landlords and peasants revolted against European commercial and political influence in China during the Boxer Rebellion (1899-1901).

land-abundant benchmark because inequality falls and thus the challengers can become a threat. Thus let us define the next two testable hypotheses:

In capital-abundant countries, the effect of an increase in tariff revenues resulting from an exogenous drop in transport costs is:

> **H3.** *The effect on power sharing is* ***ambiguous*** *because the redistributive and rapacity effects can fully offset each other.*
>
> **H4.** *The likelihood of civil conflict is* ***ambiguous*** *because the redistributive and rapacity effects can fully offset each other.*

These hypotheses also have historical support: In nations where manufacturing elites held significant influence, such as England, France, Spain and Portugal, ruling elites tended to extend the franchise to other competing elites.[13] On the one hand, Western Europe was characterized by a mercantile trade policy, resulting from the pressure from the bourgeoisie and merchants who benefited from *laissez faire*, and the need of monarchies to promote trade with colonies and other states in order to raise fiscal revenues via tariffs to fight wars (Gomes, 1987; Levi, 1988). On the other hand, small merchants and craftsmen—who had not yet been enfranchised at the beginning of the nineteenth century—became a rising political force thanks to the production of manufactured woolen and cotton textiles and the rise in transatlantic trade (Solow, 1993). Although tariff policy protected the landed elite and taxed exported manufactures, the Napoleonic wars triggered a major drop in the levels of trade as a result of the Continental Naval blockade, that was met with widespread public unrest, by the petite bourgeoisie on a wide range of social issues including trade policy (Galiani and Torrens, 2014). All in all, the social discontent culminated in rebellion, which transformed governments from absolutist monarchies to constitutionalist states and republics throughout Western Europe and led to substantial adjustments in trade policy.[14]

2.4 The role of tariff revenues

Extant theories of regime change do not incorporate the role of tariffs, concluding that trade flows should be mostly democratizing because they reduce the cost of redistribution for elites. In contrast, we predict that trade flows can instead generate a rapacity effect because tariff revenues can be captured. Furthermore, controlling tariffs contributes to the rapacity effect because tariffs not

[13] For instance, in England, merchants had already been enfranchised during the glorious revolution (1688–1689).

[14] The US is another case wherein a strong manufacturing elite held significant influence over tariff policy. In this case, the manufacturing elites accommodated the policy preferences of the southern protectionist faction thanks to the concessions made to them via fiscal transfers (Bowen, Broz and Rosendorff, 2021).

only determine which group bears the burden of the redistributive effect, but they are also essential to determine the demand for imports through their effects on import prices. In fact, we show in Appendix A.1, Section A.6, that if we hold tariffs constant we are underestimating the rapacity effect and we are also ignoring the richer theoretical perspectives derived from having endogenous tariffs in our theory. Therefore we define our last testable hypotheses:

H5. *An exogenous drop in transport costs affects tariff policy.*

H6. *The effect of an increase in trade flows resulting from an exogenous drop in transport costs underestimates the rapacity effect.*

3 Trade and Democratization in the nineteenth century

The nineteenth century marked an era of unprecedented economic exchange, largely driven by the advent of the steam engine.[15] The early 1800s saw the emergence of steam-engine vessel prototypes, but it was not until the 1850s that steamboats with compound engines and high-pressure boilers facilitated cost-efficient transatlantic trade.

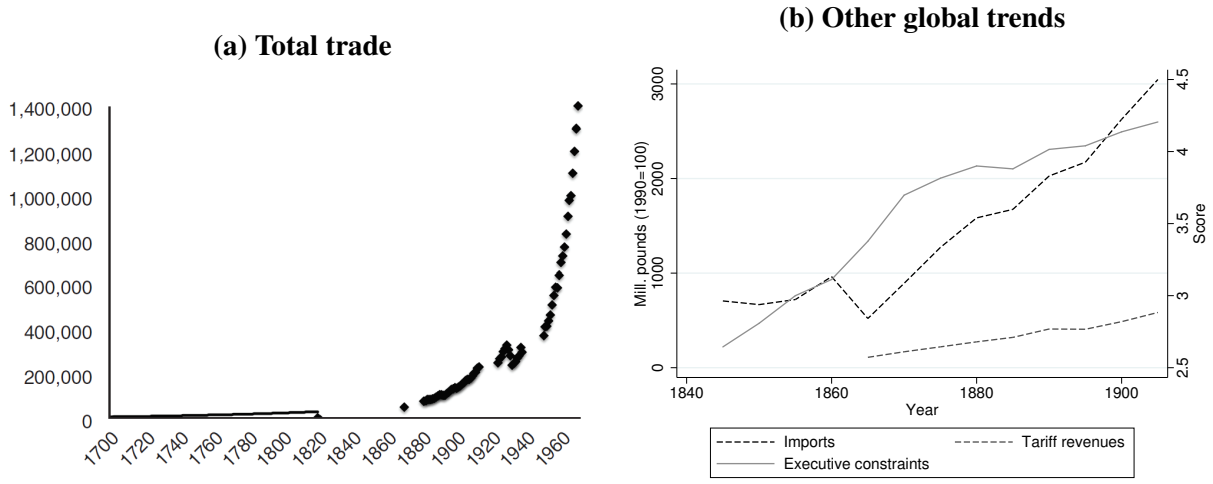
The shift from sail to steam engines occurred rapidly. By 1869, the tonnage of British steam vessels engaged in international trade exceeded that of British sailing vessels, reducing the latter's share from two-thirds to less than 15% by the early 1870s. By 1910, the transition to steamships was complete (Pascali, 2017). Consequently, global trade surged, with a notable acceleration beginning in 1870 (Figure 4 panel a).

Reduced trade costs and decreased transportation times enabled countries to bolster sectors with a comparative advantage, as overseas prices fell (O'Rourke and Williamson, 1999; Broadberry and O'Rourke, 2010). Consequently, as shown in Figure 4, panel b, imports increased. However, the economic benefits of this trade expansion were primarily experienced by countries with a comparative advantage in manufacturing (Pascali, 2017).

Democratization also progressed during this period, as illustrated in Figure 4, though with some nuances. Increased imports coincided with a dramatic rise in customs revenue, averaging a 10% annual growth rate, which generated fiscal windfalls comparable to natural resource booms. For many developing countries and former colonies, tax collection through customs was crucial due to limited fiscal capacity, resulting from low economic activity, poor property rights protection,

[15] While some might argue that steam locomotives and railroads were the primary drivers of these changes, it was the introduction of steam vessels in the shipping industry that significantly increased commercial integration across countries by enabling maritime vessels to operate independently from wind patterns (O'Rourke and Williamson, 1999).

Figure 4: Global trends



Note: Panel a is obtained from Pascali (2017); the y-axis is plotted in mill. of USD (1990=100). Panel b corresponds to yearly averages for 41 countries with available data on import tariff duties.

and information asymmetries (Queralt, 2021; Mazzuca, 2021). However, revenue windfalls also attracted conflict from factions involved in international trade policy, who sought to increase their economic and political influence (Gomes, 1987; Bushnell and Macaulay, 1994; Centeno, 2002).

4 Data

Our period of analysis covers the First Wave of Globalization—approximately from 1870 to 1913. Bilateral trade data for the period of analysis come from Pascali (2017). Data on import tariff duties come from Clemens and Williamson (2004). Imports are converted to pounds sterling (1990=100) using annual exchange rates provided by the British Board of Trade. Our main independent variable, tariff revenues, is derived from this data by multiplying the tariff rate with the value of imports. This measure is commensurable with our model in Appendix A.1.[16]

To proxy for the nature of the comparative advantage—that is, whether the economy is capital or land-abundant—we use relative caloric suitability gleaned from Galor and Özak (2015). Caloric potential corresponds to a comparable measure of caloric yield density, which focuses on potential crop yield, based on agro-climatic characteristics unaffected by human intervention—thus exoge-

[16]There is no reliable and consistent data on export tariffs for our period of analysis to carry out a similar analysis with exports. Nevertheless, we find suggestive evidence, but much weaker for a conditional rapacity effect using trade exports and total trade as the treatment variable (not shown).

nous. This measure can be interpreted as a proxy for land abundance from the perspective of relative land productivity because land-abundant economies have a higher marginal productivity of land relative to other economies. Consistent with the standard theory of comparative advantage, relatively land-scarce countries are thus relatively capital-abundant economies. Our measure of land abundance is a dummy that takes the value of one if the relative caloric potential is above the median, zero otherwise.[17]

In our model, the notion of democratization is embodied by a power-sharing agreement that allows the challengers to participate in the distribution of public resources. Thus we proxy democratization with the extent to which alternative preferences for policy formation and leadership roles can be pursued in the political arena. This idea is encapsulated by the Index of Equal Access from the Varieties of Democracy (V-Dem), which measures in a continuous interval from 0 (low) to 1 (high), if all groups "enjoy equal de facto capabilities to participate, to serve in positions of political power, to put issues on the agenda, and to influence policymaking" (Coppedge et al., 2020). We also investigate its sub-components: i) the extent to which all social groups have roughly equal political power, and ii) the extent to which there is no difference in political power between the wealthy and poor. For robustness, we also explore other standard measures of democratization and specifically political participation, including V-Dem's Participatory Democracy Index, Equal Competition Index, Polyarchy Electoral Democracy Index, the share of the population with suffrage, and Vanhanen (2002) Competition and Political Participation Indexes, and the Polity 2 Index from Polity IV. Given differences in measurement-scales, we standardize these variables for making comparisons.

For domestic conflict, we draw data on civil conflict from Haber, Menaldo et al. (2011), which measures whether a country experiences at least one intra-state war with at least 1,000 battle deaths. We also construct a measure of the percentage of years with internal wars using this information. Lastly, we also draw similar data from the Correlates-of-War, Inter-state war dataset.

To maximize the number of observations, data quality, and the overlap between the different data sources, our variables were measured every 5 years between 1870 and 1905. Tariff revenues are measured in the specific year of the observation (i.e., t), but since changes to institutional outcomes and our proxies for conflict are rare events, we measure these for the quinquennium following the year in which the tariff revenues data is measured at. That is, since the economic variables are measured for year t, institutional outcomes, and conflict use data in period p, with $p = \{t+1, ..., t+5\}$. This is equivalent to lagging the covariates of interest.

[17] Although urban population counts could proxy for a strong manufacturing sector, these counts are endogenous and prone to measurement error, especially in weak states. Caloric suitability is exogenous and dominates the conventional measures in capturing the effect of land productivity on socio-economic development (Galor and Özak, 2015, 2016).

Since historical data of this nature is sparse, especially because of the lack of consistent and comparable records on tariffs, our sample is small.[18] Figure 1 in the appendix shows the distribution of country-year observations.[19] Thus the small-sample caveats that are standard to historical political economy research, apply. In this regard, we take into account the limitations of the small sample size for statistical inference via standard procedures: Wild Bootstrapping and Jackknife type of estimations.

These limitations notwithstanding, this is one of the most comprehensive historical data sets assembled to study this question. Summary statistics are available in the Appendix, Table 1.

5 Empirical Design

Our objective is to estimate the impact of tariff revenues on democratization. To causally identify the effect of tariff revenues on democratization, we instrument tariff revenues with the change in shipping transportation times to address both omitted variable bias and reverse causality. Specifically, we exploit the exogenous component of shipping times owing to changes in the shipping technology, from sail ships to steamships.

Before the steamship was widely adopted, sail shipping vessels were at the mercy of global wind patterns (Figure B2, panels A and B). With the introduction of steam engines, shipping routes experienced a dramatic and asymmetric change in transportation times (Figure B2, Panel C). For instance, a round trip for a sailship from Lisbon to Cape Verde would take the same time as one from Lisbon to El Salvador; with a steamship, the time to complete this trip was cut in half.

Data for shipping times come from Pascali (2017), which compares the time to travel between ports using sail ships vis-á-vis using a standard Elder and Randolph compound engine. Pascali uses an algorithm that computes shortest-path transportation times between two countries, using global wind currents for the case of sail ships and the standard engine's capabilities for steamships. The changes in transportation times between sailships and steamships are as good as random because they depend on these two exogenous quantities.

We use the log changes in sail versus steamship travel times for each unique country of des-

[18] We exclude landlocked countries because the existence of a port is of preponderance for our identification strategy, since we use the exogenous changes in shipping times as an instrument (Section 5). Furthermore, our sample is made up of countries that were more developed and stable, having better record-keeping, hence our estimates should be at worst a lower bound.

[19] The sample includes British colonies. Although these societies were under the control of the British during the nineteenth century, they still had internal political processes of deliberation for policy making. Hence they exhibit variation in some of the proxies for democracy we use. Nonetheless, our results are robust to dropping British Empire-ruled polities, although this comes at the cost of lower statistical power (not shown).

tination to instrument tariff revenues.[20] We estimate the following bilateral trade equation in the first stage:

$$\begin{aligned}\ln(T_{ckt}+1) =& \beta_{steam,t(p)-1}\ln(steamTime_{ck}+1)+\beta_{sail,t(p)-1}\ln(sailTime_{ck}+1) \\ &+\rho_c+\theta_k+\psi_t+\mu_{ct}+\rho_{kt}+\nu_{ckt},\end{aligned} \tag{1}$$

where T_{ckt} are logged tariff revenues obtained from imports to country c originating from country k, at time t. $steamTime_{ck}$ and $sailTime_{ck}$ are the sailing times from country k to country c by steam and sailing vessels, respectively. The β coefficients are allowed to vary every 5 years to capture changes in the navigation technology from sail to steam as an elasticity—i.e., the percentage change in tariff revenues in response to a percentage change in shipping times. Hence $steamTime_{ck}$ and $sailTime_{ck}$ capture dyad-specific resistance terms associated with the transportation technology, which reflect the extent to which steamships are replacing sail ships over time. ρ_c, θ_k, μ_{ct} and ρ_{kt} are country of destination and country of origin fixed effects that capture origin- and destination-specific resistance terms. These resistance terms account for the extent to which the shipping technology is adopted by any given country to reduce shipping costs conditional on the structural characteristics of the economy. ψ_t are year-fixed effects, which capture any common non-monotonic trend in the adoption of steamships. $\nu_{c,t}$ is the idiosyncratic error term. The standard errors are dyad-robust.[21]

Figure 5 shows the first-stage coefficients or the change in the elasticity of tariff revenues in respect to shipping times by sail and steam vessels. We observe that the estimated elasticities for sail are statistically insignificant, and positive and become closer to zero as time progresses. In contrast, the elasticities for steam are negative and statistically significant. Mathematically, this indicates that sailships are being substituted by steamships during our period of analysis. In terms of relevance, we find that the first-stage F-test is 68.05, hence we have a relatively strong instrument.

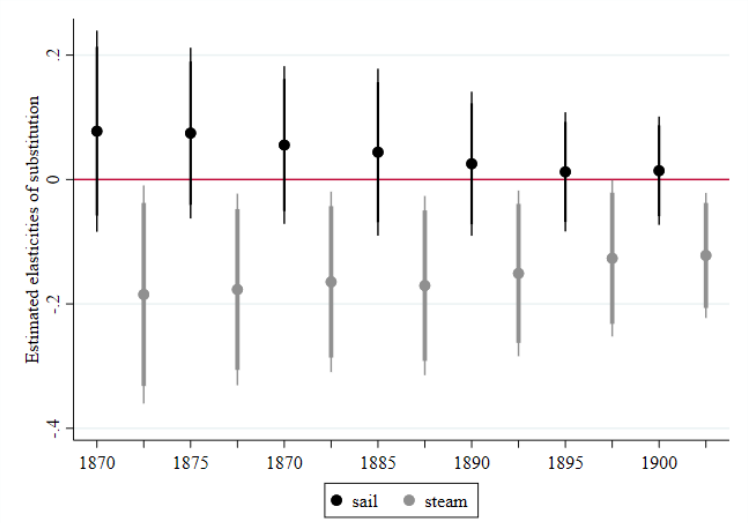
The reduction in transportation times is associated with the geographical and technological component of shipping times and reduces the cost of transportation. This reduction is thus equivalent to an exogenous improvement in the terms of trade, hence the technological shock affects both the tariff policy and subsequently the demand for imports and tariff revenues (Section 2). Therefore changes in shipping times act upon democratization because tariff revenues respond endogenously

[20] We use the logs of shipping times for two reasons: i) Shipping times exhibit a right skew, ii) Our comparative statics are denoted by elasticities (lemmas 2 and 3 in Appendix A.1), which are better approximated by a log-log specification, iii) The mathematical properties of the log-function are well defined and are empirically tractable in dyadic-to-monadic designs.

[21] Each observation is weighted by the inverse probability that the dyad ck is observed for c, to account for oversampling of country-pairs associated with data availability.

and *immediately* to a change in the terms of trade. This stands to reason because markets are generally efficient at connecting the demand and supply for goods.

Figure 5: Change in the elasticity of tariff revenues with respect to shipping times by sail and steam vessels



Note: Confidence intervals at 90% and 95% confidence are added. Standard errors are dyadic clustered. The coefficients we obtain for steamship times are negative because sailing technology restricted trading mostly to the closest trading partners.

This identifying assumption is relevant because the First Wave of Globalization has been associated with other outcomes such as economic growth, the diffusion of culture, and foreign lending, which may also affect democratization, violating the exclusion restriction. However, transatlantic trade emerged and expanded first and foremost because there were gains to be made from exporting agricultural goods, manufactures and other commodities, following the transition from mercantilism to *laissez faire* (Gomes, 1987; O'Rourke and Williamson, 1999). Growth, lending, and the flow of culture between countries were a byproduct of trade; they are unlikely an alternative mechanism. In other words, these outcomes take place after the supply and demand for agricultural goods and manufactures are realized and markets clear (Huntington, 1993; Pascali, 2017).[22] Hence these variables are statistically post-treatment. Furthermore, there is no competing theory about trade and democratization involving a process of cultural diffusion conditional on comparative advantage. All other non-economic mechanisms that may map changes in transport costs to democracy are a byproduct of market-clearing efficiencies, limiting additional concerns about the exclusion restriction.[23]

[22] We capture the slow diffusion of culture using fixed effects. (Abreu and da Silva, 2015). Furthermore, in a descriptive analysis we do not find a clear relationship between trade and education—a proxy to measure cultural development during our time period—or between trade and foreign lending (Figure B3).

[23] Exploring these additional mechanisms is outside of the scope of this paper and left for future work.

To estimate the effect of the exogenous component of tariff revenues on democratization, we first aggregate to the country-year level the fitted values from Equation 1. That is, we carry the dyadic (dyad-year) estimations over to a monadic (country-year) second-stage regression (Frankel and Romer, 1999). Specifically, we carry on the following country c, year t aggregation:

$$\widehat{T_{ct}} = \sum_{k \neq c} \exp[\widehat{\beta}_{steam,t(p)-1} \ln(steamTime_{ck}+1) + \widehat{\beta}_{sail,t(p)-1} \ln(sailTime_{ck}+1) + \widehat{\rho}_c + \widehat{\psi}_t],$$

where the exogenous component of country c's tariff revenues $\widehat{T_{ct}}$ in year t is the sum of the geographic components of changes in shipping times, of c's bilateral trade with its trading partners.

The second stage regression is given by

$$D_{ct(p)} = \delta \ln(\widehat{T_{ct}}) + \gamma_c + \phi_t + \varepsilon_{ct}, \tag{2}$$

where D_{cp} is the democratization outcome for country c during period p, with $p = \{t+1, ..., t+5\}$; γ_c and ϕ_t country and year fixed effects, and $\varepsilon_{c,t}$ is the idiosyncratic error term. Standard errors are Wild-Bootstrap clustered by country and year since that is the level of the treatment.[24]

Note that we do not control for imports, this obeys three reasons: First, tariff revenues are commensurable quantities in relation to our model because the fiscal windfalls change exogenously as a result of the transport shock and endogenously because they affect tariff policy. Our estimate of β reflects these two effects. Second, including the component terms in a log-log specification is not equivalent to doing so in a linear regression due to the properties of the logarithmic function—thus controlling for imports is empirically unwarranted. Third, the effect of imports and tariff revenues are collinear, with a correlation coefficient of 0.94, inducing multicollinearity.

The role of tariffs. If our theory is correct, estimating Equation 2 using imports should yield a rapacity effect of lower magnitude because we are holding constant the incentives to control tariffs (hypothesis H6). Thus we should find that tariffs are sensitive (i.e., elastic) to the fall in the transportation shock because they boost the rapacity effect (hypothesis H5). To evaluate this assertion, we first estimate first-stage coefficients using imports and tariffs instead of using tariff revenues (Figure B4). Our findings suggest that both imports and tariffs are relatively elastic to changes in transportation times, as expected. Importantly, we observe that the substitution effect from sailships to steamships leads to higher tariffs. Therefore, from a measurement standpoint, using tariff revenues captures this effect as opposed to using imports. Further, we evaluate the

[24]The variance-covariance matrix is the usual instrumental variables formula for Wild Bootstrap errors clustered by country and year plus $(\partial\widehat{\alpha}/\partial\widehat{\beta})\widehat{\Omega}(\partial\widehat{\alpha}/\partial\widehat{\beta})$, where $\widehat{\alpha}$ is the vector of estimated coefficients from the second-stage regression, $\widehat{\beta}$ is the vector of estimated coefficients from the bilateral trade equation, and $\widehat{\Omega}$ is the estimated variance-covariance matrix of the second-stage regression (Frankel and Romer, 1999).

robustness of these assertions by evaluating the effect of imports on our outcomes in Section 6.2.

5.1 Heterogeneous effects

Recall that the testable hypotheses herein posit that, in land-abundant economies, tariff revenues reduce power sharing and domestic conflict when landed ruling elites benefit from the reduction in transport costs (hypotheses H1 and H2). In capital-abundant economies, the effect of tariff revenues is ambiguous because the landed ruling elites are harmed by the reduction in transport costs, and thus the redistributive effect offsets the rapacity effect (hypotheses H3 and H4). To test these hypotheses we consider the effect of tariff revenues, conditional to having a land-/capital-abundant economy:

$$D_{ct(p)} = \delta_1 \ln(\widehat{T_{ct}}) + \delta_2 \ln(\widehat{T_{ct}}) \times \text{land-abundant}_c + \gamma_c + \phi_t + \varepsilon_{ct}, \tag{3}$$

where δ_1 corresponds to the effect of tariff revenues for relatively capital-abundant economies, while $\delta_1 + \delta_2$ is the estimated effect of tariff revenues in relatively land-abundant economies; δ_2 is thus the differential effect of tariff revenues for land-abundant economies.[25] Given that this regression is commensurate with our theory, we focus on it going forward.[26]

6 Main results

Table 2 presents our main results. The outcome in columns (1) and (2) is V-Dem's Equal Access Index, while in columns (3) to (6) the outcomes are the index's sub-components, the power distributed among socioeconomic and social groups. For comparisons, odd columns show OLS estimates while even ones present the two-stage least squares (2SLS) estimates. We find a heterogeneous effect for tariff revenues on V-Dem's Equal Access Index: The effect for capital-abundant economies is positive ($\widehat{\delta_1} \approx 0.12$) and not statistically significant—thus theoretically ambiguous according to hypothesis H3. However, we find a negative and statistically significant differential effect for tariff revenues ($\widehat{\delta_2} \approx -0.49$). Therefore tariff revenues have different effects in land-abundant economies vis-á-vis capital-abundant ones. Specifically, we find that a one percent increase in tariff revenues reduces the value of the Equal Access index by approximately 0.37 standard deviations for land-abundant economies; that is $\widehat{\delta_1} + \widehat{\delta_2}$. This effect is substantive and it

[25] Since the dummy for land abundance splits the sample evenly and there are no additional covariates, we do not face issues of poor extrapolation due to the lack of statistical support.

[26] Table B2 shows the estimates of Equation 2. Consistent with the extant literature on trade and democratization, we observe the lack of statistically significant results for the 2SLS estimates.

provides evidence for a rapacity effect in land-abundant economies in relation to hypothesis H1.

The lack of an effect in capital-abundant economies, indicates that the redistributive effect incentivizes ruling elites to share power, thus acting against the rapacity effect. Note also that the point estimate is positive, which suggests that elites in capital-abundant economies are more likely to choose avoiding conflict by offering concessions to challengers when tariff revenues raise the stakes of controlling the government.

We find similar effects for the index of power distributed among socioeconomic groups (column 4), but not for the index of power distributed among social groups (column 6). Therefore, we conclude that the windfalls affected the extent to which power-sharing agreements occurred between socioeconomic groups (e.g., landed elites and manufacturing elites) as opposed to between rich and poor—consistent with our theory.

Table 2: Effect of Tariff Revenues on Political participation

Dependent variable:	Equal Access Index		Power distributed among socioeconomic groups		Power distributed among social groups	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
log(Tariff Revenues)	0.582**		0.393**		0.465**	
	(0.176)		(0.145)		(0.168)	
log(Tariff Revenues) X Land Abundant	-0.560**		-0.348**		-0.460**	
	(0.167)		(0.134)		(0.164)	
log(Exogenous Tariff Revenues)		0.124		0.013		0.193
		(0.232)		(0.153)		(0.202)
log(Exogenous Tariff Revenues) X Land Abundant		-0.489**		-0.391**		-0.314**
		(0.199)		(0.194)		(0.143)
Observations	202	202	202	202	202	202
Country FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Treatment + Interaction	0.022	−0.366**	0.045	−0.379*	0.005	−0.121
SE(Treatment + Interaction)	0.015	0.156	0.030	0.218	0.009	0.100
p-value(Treatment + Interaction)	0.196	0.019	0.190	0.083	0.558	0.228
First Stage F-stat		63.356		63.356		63.356

Notes: Coefficients are standardized. Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%.

6.1 Domestic conflict

We also analyze the causal effect of tariff revenues on domestic conflict. Table 3 provides suggestive evidence in support of the associated testable hypotheses. First, we find that an increase of one percent in tariff revenues reduces the likelihood of intra-state conflict by 34 percentage

points for land-abundant economies (hypothesis H2). For capital-abundant economies, the effect is positive but not statistically significant (Column 2)—thus theoretically ambiguous as predicted by hypothesis H4. Similarly, there is a statistically significant differential effect in the percentage of years of civil war in land-abundant economies vis-á-vis capital-abundant economies, of about a 14% reduction in the likelihood of civil conflict for a one percent increase in tariff revenues.

We find consistent results using data on intra-state conflict from the Correlates of War (columns 6 and 8), although they are statistically weaker. Since the point estimates are somewhat smaller than those obtained in Columns 2 and 4, we suspect the existence of attenuation bias due to potential measurement error in Correlates of War (Hensel and McLaughlin, 2015). Further, we must also consider that conflicts are rare events and sample sizes are small in this case, therefore we could be underpowered as well. Nevertheless, our results provide compelling evidence for the effect of tariff revenues on conflict insofar as the point estimates are in line with our theoretical predictions and with the results obtained for power sharing and civil war.[27]

Table 3: Effect of Tariff Revenues on Intra-State Conflict

Dependent variable:	Civil War Indicator (Haber, Menaldo et al., 2011)		Percentage of Years of civil War (Haber, Menaldo et al., 2011)		Intra-state War Indicator (Corr. of War)		Percentage of Years of Intra-state War (Corr. of War)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(Tariff Revenues)	0.111		0.050		0.079		0.038	
	(0.082)		(0.040)		(0.070)		(0.034)	
log(Tariff Revenues) X Land Abundant	-0.107		-0.048		-0.073		-0.036	
	(0.085)		(0.039)		(0.071)		(0.035)	
log(Exogenous Tariff Revenues)		0.021		0.015		0.024		-0.004
		(0.086)		(0.040)		(0.083)		(0.037)
log(Exogenous Tariff Revenues) X Land Abundant		-0.344**		-0.137*		-0.218		-0.129
		(0.143)		(0.072)		(0.160)		(0.081)
Observations	202	202	202	202	202	202	202	202
Country FEs	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓
Treatment + Interaction	0.004	−0.323**	0.002	−0.123	0.006	−0.194	0.002	−0.133
SE(Treatment + Interaction)	0.021	0.152	0.005	0.075	0.009	0.153	0.004	0.083
p-value(Treatment + Interaction)	0.845	0.033	0.695	0.102	0.554	0.205	0.633	0.109
First Stage F-stat		63.356		63.356		63.356		63.356

Notes: Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%.

[27] In Table 6, in the Appendix, we estimate the effect of tariff revenues on inter-state wars. However, we do not find statistically significant effects.

6.2 Robustness

Our findings are also robust to numerous tests (Appendix B). Specifically, i) Our results are not sensitive to any one country in our sample (Figure B5), ii) They are also robust to using imports as the main dependent variable (tables B3 and B4). Notice also that the point estimates are smaller vis-á-vis our main estimates and not significant, providing suggestive evidence for hypothesis H6. Thus governments have greater flexibility in setting tariffs as the terms of trade improve, which adds to the rapacity effect. iii) The point estimates obtained from using other indexes of political participation are similar (Figure B5). However, the measures developed by the V-Dem project should outperform these indexes with respect to the underlying definition and measurement scale (Boese, 2019). iv) Inter-state war efforts could have affected the extent to which the new maritime technology was adopted, as well as taxation and democratization (Dincecco, 2011), implying that war could be a worrisome confounder. However, our outcomes are robust to controlling for inter-state wars (tables B7 and B8). v) We also find evidence that our interaction effect is likely robust to unobservable confounding, insofar as a confounder would need to have a bigger partial R^2 than our treatment conditional on being a capital abundant economy (Figure B6). These robustness tests therefore give credence to the theory and results herein.

7 Conclusions

This study presents a novel theoretical framework and empirical evidence to understand the role of trade taxes, specifically tariff revenues, in the context of democratization and conflict. We show that tariffs and their fiscal windfalls can attract competition over the control of these resources and reduce democratization. However, the characterization of the effects of tariff revenues is moderated by the structure of the economy. An exogenous increase in tariff revenues is accompanied by an effect on the terms of trade, which generates a conditional rapacity effect that is anti-democratic in nature, thus shaping institutional development. This effect is reinforced by a redistributive effect in land-abundant economies, wherein landed ruling elites benefit from the change in the terms of trade due to the trade shock. Therefore, when the ruling elites benefit from the shock, the causal effect of tariff revenues decreases political participation, and thus democratization. This effect is accompanied by a decrease in intra-elite conflict as challengers are discouraged by the increase in the ruling elites' economic power. In contrast, when the ruling elites lose from the shock, the effect of tariff revenues can lead to more domestic conflict and political participation, because elites weaken and as a result, they have incentives to share power given the threat their challengers pose to them, offsetting the rapacity effect.

Our findings are relevant to modern-day societies. This paper indicates that fiscal windfalls owing to tariffs are consequential for countries that depend largely on this type of revenue because they can generate an anti-democratic rapacity effect, thus shaping institutional development. However, future research needs to take into account the socioeconomic transformations of the past years to define the politically relevant groups and industries to pin down the characteristics of the redistributive effect entailed by tariffs as we did herein, as the economic and social structure has become more complex since the nineteenth century. Our findings are a first step forward in this regard by providing evidence in the context of the First Wave of Globalization.

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Online Appendix

A Mathematical appendix

A.1 Tariffs in an model of regime change

There are two groups: the ruling elites (E) and the challengers (C). Define $i = \{E, C\}$. The population is normalized to one—$N_E + N_C = 1$—with $N_C > N_E$. The economy has two sectors, each producing a (generic) good using a combination of land (L), and capital (K). Each group possesses one unit of capital and no or some positive amount of land. Assume that $L_E > L_C$. The marginal return to capital is denoted with $r > 0$; for land this is $\omega > 0$.

Without loss of generality, the economy is capital scarce and land abundant vis-á-vis its trading partners. Production technologies exhibit constant returns to scale, are homogeneous of degree one, and are twice differentiable and strictly concave. All markets are perfectly competitive and are in equilibrium.

The comparative advantage lies in the land-intensive sector and the capital-intensive commodity is in the import-competing sector. The first commodity can be tied to manufactures while the second to agricultural products. Therefore ruling elites obtain most of their income from the agricultural sector whereas the challengers from manufactures.

Group i's share in total output is

$$\pi_i = \frac{r + \omega L_i}{rK + \omega L}, \tag{A.1}$$

where K is the total capital supply and $\sum_i L_i = L$ the total land supply. Notice that $\pi_C < \pi_E$. Further, higher ownership of both means of production by the ruling elites is inconsequential because player's actions respond to the level of inequality (π).

Tariff revenues are given by

$$T = (p - q)M(p) \tag{A.2}$$

where $p = q(1 + t)$ is the relative domestic price of the agricultural good, t is the tariff rate and $q = p^\star(1 + \theta)$. $p^\star > 0$ is the international price of this commodity and $\theta \geq 1$ is the transport cost; the manufactured good serves as our numeraire. $M(p)$ is the import demand function, which is a decreasing function of p.

The amount of tariff revenues that group i receives depends on the amount of political power

they hold. If they control the government their dominant strategy is to consume all the fiscal revenue; conversely if they are disenfranchised they do not receive income from trade taxes. If i shares power with the other group, they share the fiscal revenue. i's total utility function is therefore

$$u_i(p,q) = \begin{cases} N_i^{-1}\pi_i(rK+\omega L) & \text{if } i \text{ doesn't control the government,} \\ N_i^{-1}[\pi_i(rK+\omega L)+T(p,q)] & \text{if } i \text{ controls the government,} \\ N_i^{-1}\pi_i(rK+\omega L)+T(p,q) & \text{if } i \text{ shares power.} \end{cases} \tag{A.3}$$

Tariff revenues affect the pay-offs in all of the cases above because they affect inequality (π) and the tariff revenue (T) insofar as tariffs affect the domestic price and thus the demand for imports.

A.2 Players' preferences

Recall p is a linear function of t, hence i's objective is to find the optimal level of protectionism, $p_i \equiv \text{argmax}_{p_i} u_i(p,q)$, whenever it can choose the tariff policy. For simplicity we assume that if the franchise is extended, tariffs are set by a central planner but distributed to all citizens equally; i.e., a policy concession (Grossman and Helpman, 1996).

Lemma 1 summarizes the results of this maximization process.

Lemma 1. *If i controls the government $p_i = q\left[1-\frac{Y}{q}\left(\frac{\partial\pi_i/\partial t}{\partial M/\partial t}\right)\right]$, where Y is the total economic output and $-\partial M/\partial t > 0$. In a land abundant economy where the ruling elite owns most land, $\partial\pi_E/\partial t < 0$ and $\partial\pi_C/\partial t > 0$. If i doesn't control the government its preferences are irrelevant. If power is shared the tariff policy is $p_S = q\left[1-\frac{M}{\partial M/\partial t}\right]$.*

Proof of Lemma 1. Case 1 - non-democracy. The dominant strategy for whomever controls the government is to allocate all fiscal revenues to themselves. Also, let us redefine the problem insofar as $p = q(1+t)$ and q is exogenous:

$$\underset{t_i}{\text{argmax}}\ N_i^{-1}[\pi_i(rK+\omega L)+T(p(t_i,q),q)]. \tag{A.4}$$

Note that i's maximum attainable utility depends on its own income share in addition to domestic prices and aggregate income as faced by all individuals. Thus we can write the indirect utility function as:

$$V_i = V_i(p,\gamma_i),$$

where $\gamma_i = N_i^{-1}(\pi_i Y + T)$ and $Y = \omega L + rK$.

First we find the effect of a tariff increase on i's welfare. After a few calculations we obtain that

$$\frac{\partial V_i}{\partial t} = N_i^{-1} \frac{\partial V_i}{\partial \gamma_i} \left[tq \frac{\partial M}{\partial t} + Y \frac{\partial \pi_i}{\partial t} \right].$$

Assuming that V_i is strictly concave in t, i's optimal tariff is found where $\partial V_i / \partial t = 0$, therefore

$$t_i = -\frac{Y}{q} \left(\frac{\partial \pi_i / \partial t}{\partial M / \partial t} \right)$$

is i's optimal trade tariff, where Y is the total economic output and $-\partial M / \partial t > O$. Since the domestic price satisfies $p_i = q(1+t_i)$, then

$$p_i = q \left[1 - \frac{Y}{q} \left(\frac{\partial \pi_i / \partial t}{\partial M / \partial t} \right) \right].$$

To sign $\partial \pi_i / \partial t$ we differentiate A.1 with respect to t:

$$\frac{d\pi_i}{dt} = \frac{\partial p}{\partial t} \left[\frac{\left(\frac{\partial \omega}{\partial p} L_i + \frac{\partial r}{\partial p} \right)(\omega L + rK) - \left(\frac{\partial \omega}{\partial p} L + \frac{\partial r}{\partial p} K \right)(\omega L_i + r)}{(\omega L + rK)^2} \right]$$

Let us define $l = L/K$ and $l_i = L_i/K$ and use the fact that the elasticities of substitution can be written as $\widehat{\omega}/\widehat{p}$ and $\widehat{r}/\widehat{p}$ to get:

$$\frac{d\pi_i}{dt} = \frac{rK}{(\omega L + rK)^2 (1+t)} \left[\omega (l - l_i) \frac{(\widehat{r} - \widehat{\omega})}{\widehat{p}} \right]$$

The sign of $\partial \pi_E / \partial t$ depends on the incumbent group's endowments as well as on the production structure through which factor returns and commodity prices are linked, for example:

$$\frac{\partial \pi_E}{\partial t} = \frac{rK}{(\omega L + rK)^2 (1+t)} \left[\omega (l - l_E) \frac{(\widehat{r} - \widehat{\omega})}{\widehat{p}} \right],$$

where l is the economy's land-to-capital ratio, l_E is amount of land that ruling elites' own as a share of the amount of capital they hold, and the "hats" indicate percent changes. Since the home country enjoys a comparative advantage in the production of land intensive goods vis-á-vis manufactures, we have that $(\widehat{r} - \widehat{\omega})/\widehat{p}$ is positive because the commodity imported is relatively capital intensive. Then $\partial \pi_E / \partial t < 0$ if $l_E > l$ and $\partial \pi_E / \partial t > 0$ if $l_E < l$. In contrast, if the home country enjoys a comparative advantage in the production of capital intensive goods such as manufatures, $(\widehat{r} - \widehat{\omega})/\widehat{p}$

is negative because the commodity imported is relatively labor intensive. Then $\partial \pi_E / \partial t > 0$ if $l_E > l$ and $\partial \pi_E / \partial t < 0$ if $l_E < l$. The results for the remaining cases follow from a similar analysis.

Case 2 - power sharing. Since we assume that a central planner chooses policy, we care about

$$\underset{t_S}{\text{argmax}}\ T(p,q),$$

where p is a function of t. This problem is straightforward to solve:

$$t_S = -\frac{M}{\partial M/\partial t}.$$

Hence

$$p_s = q\left[1 - \frac{M}{\partial M/\partial t}\right].$$

□

We can order the tariff preferences in each political regime: Corollary 1 states that tariffs are bound to be higher if power is shared because doing so means that the preferences of the challengers are incorporated in the policy making process.

Collorary 1. *In a land abundant economy wherein the ruling elite owns most land, $p_C > p_E$. Furthermore, $p_S > p_E$.*

Proof of Corollary 1. If the ruling elites hold most land ($l_E > l$), we have in non-democracy that

$$p_C > p_E \iff t_C > t_E \iff -\frac{Y}{q}\left(\frac{\partial \pi_C/\partial t}{\partial M/\partial t}\right) > -\frac{Y}{q}\left(\frac{\partial \pi_E/\partial t}{\partial M/\partial t}\right) \iff \partial \pi_C/\partial t > \partial \pi_E/\partial t.$$

From Lemma 1, the preferred policy by E is

$$t_E = -\frac{Y}{q}\left(\frac{\partial \pi_E/\partial t}{\partial M/\partial t}\right),$$

which is negative. In contrast, the revenue maximizing tariff policy is given by

$$t_S = -\frac{M}{\partial M/\partial t},$$

which is positive. Therefore it follows that t_E is inefficient. □

A.3 Power transitions

Start from an initial condition wherein ruling elites hold all the de jure power. The challengers have no de jure power but may challenge the elites for the control of government using de facto power. We have few concerns about a potential collective problem for the outcome of rebellion herein because our focus are elites, which are smaller groups that can coordinate (Ansell and Samuels, 2014; Haggard and Kaufman, 2016).

Let us define $Pr(\pi_C)$ with $\partial Pr/\partial \pi_C > 0$, the probability that the challenger succeeds in a rebellion. Rebellions are costly due to the indirect costs associated to fighting ($\kappa > 0$). If the challengers succeed they take control over government and thus decide the tariff policy and the allocation of fiscal revenues.

Whomever wins the contest expropriates the resources of the losing side. This has two advantages: i) we normalize the pay-offs of the losing-side to zero, and ii) it provides tractability because the winner chooses the revenue maximizing tariff (p^w).

Ruling elites may prevent a costly conflict by sharing power with the challengers, which entails accommodating the policy preferences of the challengers and distributing tariff revenues more equally (Equation A.3 and Corollary 1). In this regard, we refrain from incorporating credibility in policy concessions and from considering a two-dimensional policy space in our model, to keep things simple, tractable and to guarantee a unique equilibrium.

The timing of the game events is as follows:

i) Ruling elites decide whether to share power with the challengers or implement policy p_E.

ii) If the elites share power the policy is p_S and tariff revenues are distributed equally.

iii) If power isn't shared, the challengers observe the ruling elites' policy and decide whether to rebel or not.

iv) If the challengers rebel they succeed with probability $Pr(\pi_C)$.

   (a) If the rebellion succeeds there is a costly transition of power, the challengers expropriates the ruling elite, set the revenue maximizing tariff and consume all fiscal revenues.

   (b) If the rebellion fails, the ruling elite expropriates the challenger, sets the revenue maximizing tariff and consumes all fiscal revenues.

v) If the challengers do not rebel, ruling elites stay in power, they implement p_E and consume all fiscal revenues.

A.4 Equilibrium

Challengers compare the benefits of rebelling vis-á-vis those of not doing so given the optimal policy chosen by the group in power, and decide whether to rebel or not; i.e., whenever $E[u_C(p^m,q)] - \kappa \geq u_C(p_E,q)$ they rebel. This is the *rebellion constraint*. On the other hand, elites compare the net benefits of sharing power vis-á-vis those of a rebellion. Hence whenever $E[u_E(p^m,q)] - \kappa \leq u_E(p_S,q)$, elites share power. This is the *power sharing constraint*.

Proposition 1 summarizes the best responses in equilibrium on the basis of the previous constraints.

Proposition 1. *The Sub-game Perfect Nash Equilibrium of the model defined above is:*

- *If the rebellion constraint doesn't bind, the status quo holds: policy is set at p_E and all tariff revenues are consumed by the ruling elite.*
- *If the rebellion constraint binds and the power sharing constraint doesn't bind, the challengers stage a rebellion. There is a power transition with probability $Pr(\pi_C)$ and the losers are expropriated: policy is set at p^m and the loser's pay-off is zero.*
- *If both the rebellion and the power sharing constraints bind, elites share power and tariff revenues with the challengers.*

Proof of Proposition 1. Denote $\overline{\kappa}$ the critical value of the cost for which the rebel constraint holds with equality; similarly denote $\underline{\kappa}$ the critical value of the cost for which the power sharing constraint holds with equality. Note that $\overline{\kappa} > \underline{\kappa}$ and thus we obtain the following taxonomy:

- If the cost of rebellion is below $\underline{\kappa}$, ruling elites know that they are worse off in expectation from a power transition. To avoid this, they share power.
- If the cost of rebellion lies between $\underline{\kappa}$ and $\overline{\kappa}$, elites are better off by risking a rebellion that could fail because the challengers' victory is uncertain.
- But when $\kappa > \overline{\kappa}$, the rebellion constraint does not bind and thus elites know that a rebellion cannot take place.

Note that there are no incentives for the ruling elite to expropriate the challengers arbitrarily because this only occurs if $E[u_E(p^m,q)] - \kappa \geq u_E(p_E,q)$, which is equivalent to saying that $\kappa \geq \overline{\overline{\kappa}}$, with $\overline{\overline{\kappa}}$ the value of κ for which the previous expropriation constraint satisfies with equality. $\overline{\overline{\kappa}}$ is always greater than $\overline{\kappa}$ and $\underline{\kappa}$, hence the case of $\kappa > \overline{\overline{\kappa}}$ is of no interest to us. □

A.5 The role of trade shocks

Trade shocks arise from technological innovations affecting transportation costs, which are tantamount to a change in the terms of trade. These changes affect imports and thus tariff revenues directly because transport costs affect domestic prices, and also indirectly because they affect tariff choices. Having this in mind, we characterize below the variation in equilibrium outcomes (Proposition 1) as a function of transport costs on both domestic conflict and power sharing in lemmas 2 and 3. These lemmas consider the benchmark case of a land abundant economy and a fall in transport costs; i.e., having better terms of trade ($dq < 0$). We interpret these lemmas in Section 2.

Lemma 2. *In a land abundant economy where the ruling elite owns most land, the effect of a shock that reduces transport costs on the likelihood of rebellion is ambiguous since the rapacity and redistributive effects pull in opposite directions, canceling each other out. The transport shock increases the likelihood of rebellion as long as the rise in inequality is much smaller than the increase in the demand for imports and tariffs.*

Proof of Lemma 2. For tractability, assume that $Pr(\pi_C) = \pi_C$. We explore the effect of a shock that reduces the transport costs ($dq < 0$) on the critical value $\overline{\kappa}$ (see the proof for Proposition 1), where

$$\overline{\kappa} = N_C^{-1}\pi_C(p_E, q)T(p^m, q).$$

Applying the chain rule and also the implicit function theorem we obtain:

$$\begin{aligned}\frac{d\overline{\kappa}}{dq} =& N_C^{-1}\left[qt^m M(p^m)\left(\frac{\partial \pi_C(p_E,q)}{\partial t_E}\frac{\partial t_E}{\partial q} + \frac{\partial \pi_C(p_E,q)}{\partial q}\right)\right. \\ &\left. + \pi_C(p_E,q)\left(t^m M(p^m) + qt^m\frac{\partial M(p^m)}{\partial q} + qM(p^m)\frac{\partial t^m}{\partial q}\right)\right].\end{aligned}$$

The first term inside the brackets captures the *redistributive effect* and the second one, the *rapacity effect*. Note that $\frac{\partial \pi_C}{\partial t_E} > 0$, $\frac{\partial t^m}{\partial q} < 0$ and $\frac{\partial t_E}{\partial q} > 0$ because an exogenous price hike would necessarily lead to a reduction in the tariff rate to maintain efficiency, and to the opportunity of obtaining a higher relative subsidy on exports (Lemma 1). Also, $dM(p^m)/dq < 0$ because the demand for imports falls with a higher international price. Thus an improvement in the terms of trade ($dq < 0$) reduces the likelihood of rebellion via de distributive effect and increases it via the rapacity effect.

Next we investigate under what circumstances the likelihood of rebellion grows. Rewriting the

previous expression in terms of elasticities, this occurs whenever

$$1+\varepsilon_M+\varepsilon_{t^m}>-\varepsilon_{\pi_C}-\eta_{\pi_C}\varepsilon_{t_E},$$

where $\varepsilon_M \leq 0$ is the price elasticity of import demand , $\varepsilon_{t^m} \leq 0$ is the price elasticity of efficient tariffs, $\varepsilon_{\pi_C} \geq 0$ is the price elasticity of inequality, $\varepsilon_{t_E} \leq 0$ is the price elasticity of the status quo tariff and $\eta_{\pi_C} \geq 0$ is the elasticity of inequality to a change in tariffs. □

Lemma 3. *In a land abundant economy where the ruling elite owns most land, the effect of a shock that reduces transport costs unambiguously reduces the likelihood that ruling elites share power since the rapacity and redistributive effects go in the same direction.*

Proof of Lemma 3. We proceed similarly to Lemma 2: We explore the effect of a shock that reduces the transport costs ($dq < 0$) on the critical value $\underline{\kappa}$ (see the proof for Proposition 1), where

$$\underline{\kappa}=[N_E^{-1}\pi_E(p_E,q)-1]T(p^m,q).$$

Applying the chain rule, the implicit function theorem, and rewriting in terms of elasticities, the likelihood of democratization grows whenever we obtain:

$$\frac{d\underline{\kappa}}{dq}=(1+\varepsilon_M+\varepsilon_{t^m})\big(\pi_E(p_E,q)-N_E\big)-\pi_C(p_E,q)\varepsilon_{\pi_C}-\eta_{\pi_C}\varepsilon_{t_E}+q>0.$$

□

All in all, I summarize the results above in the following analytical typology:

Table A. 1: Analytical typology for a reduction in transportation costs

Country type	Ruling elites (challengers) own most land (capital)	Ruling elites (challengers) own most capital (land)
Land abundant	Power sharing and intra-state conflict decreases (unambiguously): rapacity and redistributive effects go in the same direction.	Ambiguous effect in power sharing and conflict: rapacity and redistributive effects go in the opposite direction.
Capital abundant	Ambiguous effect in power sharing and conflict: rapacity and redistributive effects go in the opposite direction.	Power sharing and intra-state conflict decreases (unambiguously): rapacity and redistributive effects go in the same direction.

Note: Higher ownership of both means of production by either group is inconsequential because the re-distributive effect responds to inequality (π).

A.6 Holding tariffs constant

If we hold tariffs constant, we obtain that

$$\frac{d\overline{\kappa}}{dq} = \varepsilon_{\pi_C} + \varepsilon_M + 1.$$

We use price elasticities to be consistent with lemmas 2 and 3.

The rapacity effect dominates the redistributive effect as long as:

$$\varepsilon_{\pi_C} + \varepsilon_M > -1,$$

where $\varepsilon_M \leq 0$ is the price elasticity of import demand and $\varepsilon_{\pi_C} \geq 0$ is the price elasticity of inequality.

Now, $d\underline{\kappa}/dq$ is given by

$$\frac{d\underline{\kappa}}{dq} = (1+\varepsilon_M)\big(\pi_E(p_E,q) - N_E\big) - \pi_C(p_E,q)\varepsilon_{\pi_C} + q.$$

The first thing to notice is that $\partial\pi_E/\partial q < 0$, which follows from applying the same reasoning as in Lemma 1, likewise $dM(p^m)/dq < 0$. Therefore the redistributive and rapacity effect reinforce each other.

The difference between this model, with exogenous tariffs, and the main model, with endogenous tariffs, is that the rapacity effect can be weaker in the former model vis-á-vis the latter because tariff policy is also at stake in the latter model.

B Empirical appendix

Figure B. 1: Countries and years in the sample

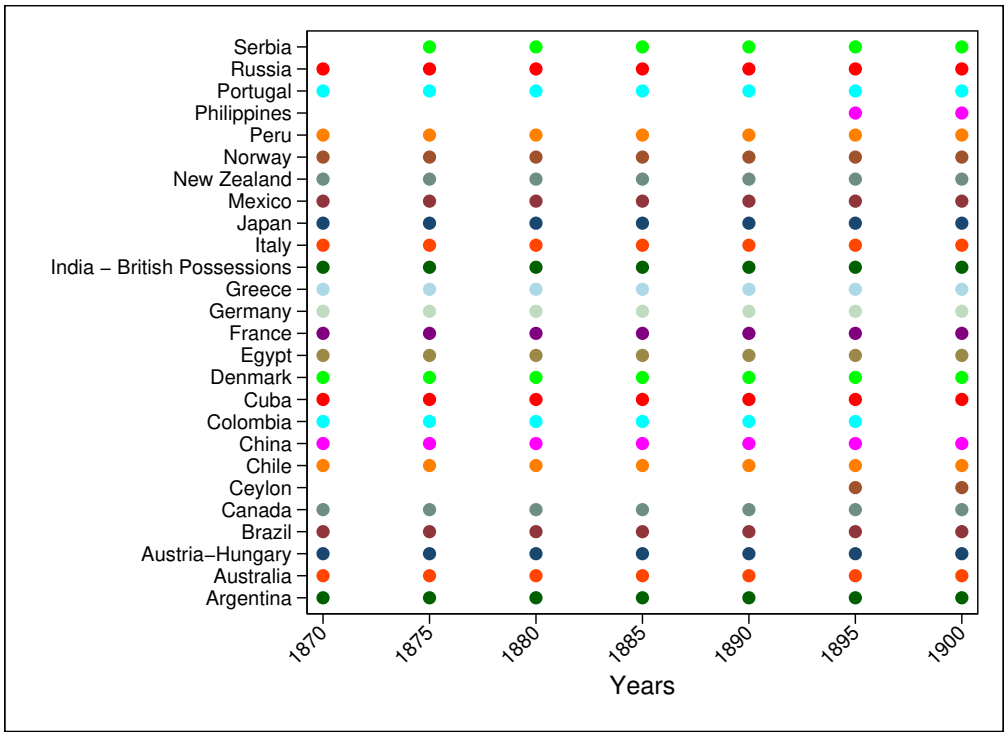
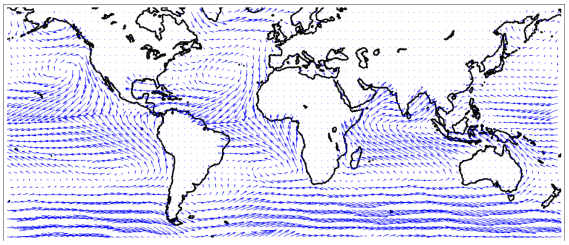
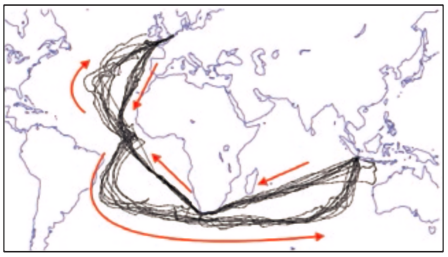


Figure B. 2: Wind patters and changes in maritime transportation

(a) Prevailing sea surface winds throughout the world



(b) Example of a shipping route: England to Indonesia and back



(c) Change in transportation times

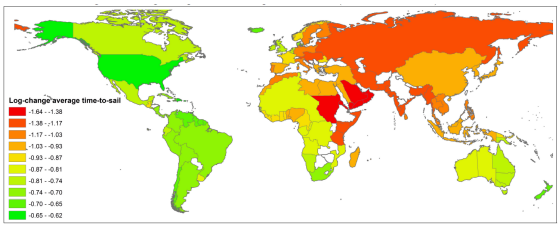
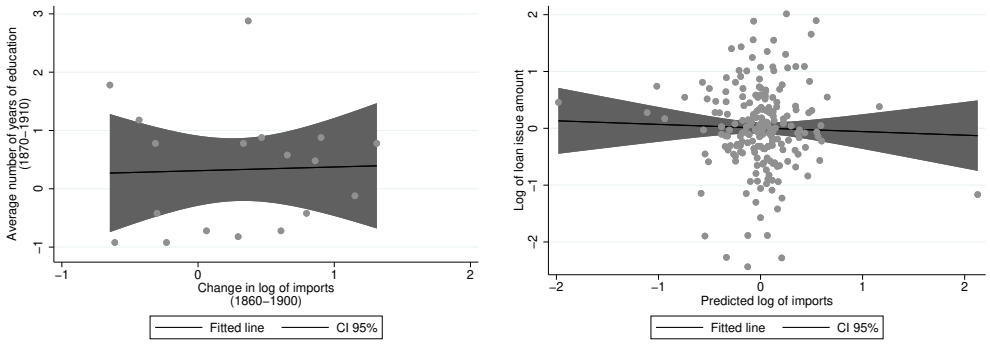


Figure B. 3: Alternative mechanisms as a function of imports

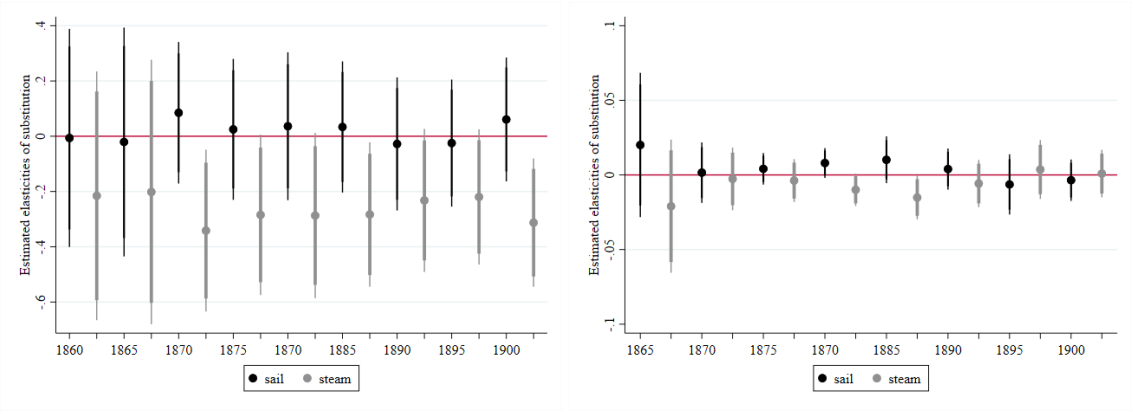
(a) Educational attainment **(b) Foreign borrowing**



Note: Dependent and independent variables are residualized to account for fixed effects.

Figure B. 4: Change in the elasticity of imports with respect to shipping times by sail and steam

(a) Imports **(b) Import tariffs**



Note: Confidence intervals at 90% and 95% confidence are added. Standard errors are dyadic clustered. The coefficients we obtain for steamship times are negative because sailing technology restricted trading mostly to the closest trading partners.

Table B. 1: Descriptive statistics

	Mean	SD	Min	Max	N
Pane A - Political Participation & Democratization:					
Avg. equal access index	0.29	0.18	0.03	0.74	202
Power distributed among socioeconomic groups	-0.71	1.04	-3.14	1.21	202
Power distributed among social groups	0.00	1.06	-2.72	2.15	202
Avg. equal competition index	0.33	0.19	0.02	0.76	202
Avg. equal protection index	0.36	0.25	0.01	0.88	202
Avg. polyarchy index	0.27	0.17	0.02	0.80	198
V-Dem's Participatory Democracy Index	0.16	0.11	0.01	0.55	198
Avg. suffrage index	0.27	0.22	0.00	1.00	202
Avg. competitiveness score in 5-year period	21.36	18.42	0.00	67.72	165
Vanhannen's Political Participation Index	5.44	2.81	1.00	10.00	157
Avg. polity2 score in 5-year period	0.24	6.14	-10.00	10.00	166
Panel B - Tariff Revenues and Imports:					
Log imports	14.08	14.53	1.32	87.50	202
log(Predicted imports)	2.93	1.04	0.87	5.79	202
log(Predicted imports) (interaction prediction)	2.95	1.06	0.88	5.88	202
Log of tariff revenues	4.65	4.65	1.31	38.52	202
log(Predicted tariff revenues)	3.18	0.95	1.09	5.23	202
log(Predicted tariff revenues) (interaction prediction)	3.18	0.95	1.09	5.24	202
Terms of Trade	105.23	22.41	60.47	220.04	202
Log sail time	8.44	1.14	5.15	10.77	202
Log steam time	7.65	1.15	4.14	9.83	202
Panel C - Agriculture Comparative Advantage (Moderator):					
Caloric suitability (sum of raster)*	32468420.6	48844029.6	52,745.004	192063280	202
log(caloric suitability) (sum of raster)	16.09	1.79	10.87	19.07	202
Land indicator (caloric suitability $>$ p(50)=1)	0.48	0.50	0	1	202
Panel D - Proxies for Conflict:					
Internal war in 5-year period	0.16	0.37	0	1	202
Perc. years of internal conflict in 5-year period	0.08	0.20	0	1	202
Civil war in 5-year period	0.12	0.33	0	1	159
Perc. years of civil war in 5-year period	0.04	0.14	0	1	159
Intra-state war in 5-year period (Corr. of War)	0.12	0.33	0	1	202
Avg. deaths in inter-state war years	4435.16	35089.73	0	400000	202
Perc. years of intra-state war (Corr. of War)	0.04	0.13	0	1	202
Inter-state war in 5-year period	0.11	0.32	0	1	202

Note: * Data drawn from Galor and Özak (2015) corresponds to caloric potential index obtained from raster data. It is a constant for the period of analysis.

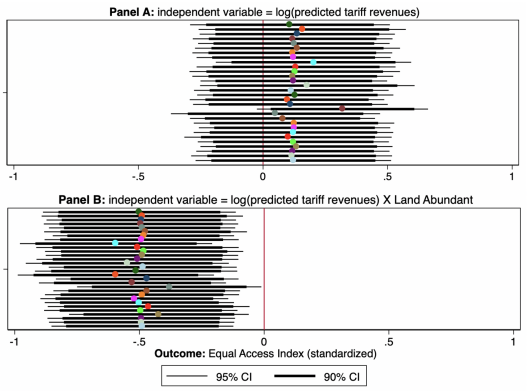
Table B. 2: Effect of Tariff Revenues on Political Participation

Dependent variable:	Equal Access Index		Power distributed among socioeconomic groups		Power distributed among social groups	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
log(Tariff Revenues)	0.027		0.047		0.009	
	(0.018)		(0.031)		(0.013)	
log(Exogenous Tariff Revenues)		-0.037		-0.121		0.093
		(0.191)		(0.159)		(0.119)
Observations	202	202	202	202	202	202
Country FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
First Stage F-stat		68.05		68.05		68.05

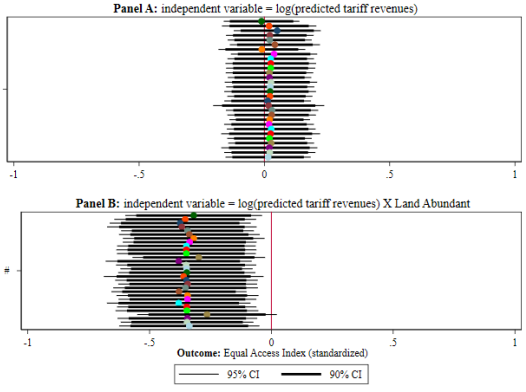
Notes: Outcomes are standardized. Country and year cluster-robust standard errors adjusted for a small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%.

Figure B. 5: Effects of tariff revenues, dropping one country out with replacement

(a) Political participation



(b) Inter-state conflict



Note: We run the same specification as in Table 3 but dropping one country at a time out of the 31 countries in the sample. We report 95% confidence intervals.

Figure B. 6: Sensitivity analysis

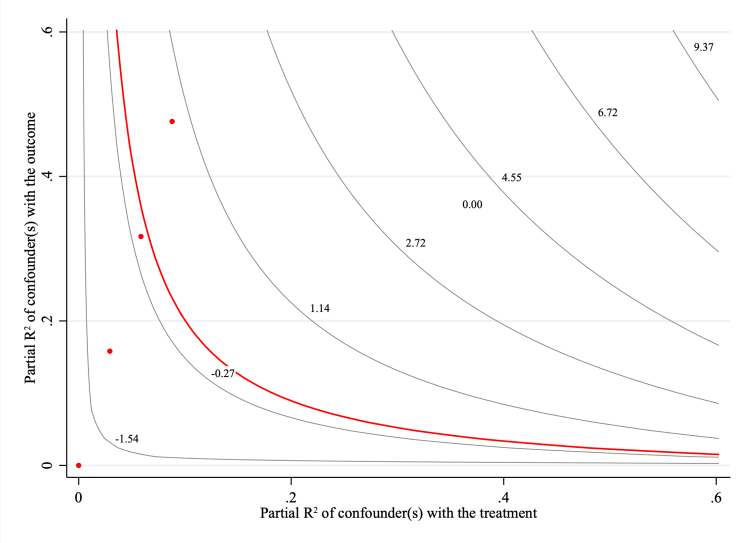


Table B. 3: Effect of Imports on Political participation

Dependent variable:	Equal Access Index		Power distributed among socioeconomic groups		Power distributed among social groups	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
log(Imports)	0.045		0.025		0.033	
	(0.035)		(0.028)		(0.026)	
log(Imports) X Land Abundant	-0.044		-0.021		-0.033	
	(0.035)		(0.027)		(0.026)	
log(Exogenous Imports)		0.127		0.027		0.197
		(0.242)		(0.168)		(0.218)
log(Imports) X Land Abundant		-0.462*		-0.341		-0.304
		(0.275)		(0.232)		(0.203)
Observations	202	202	202	202	202	202
Country FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Treatment + Interaction	0.001	−0.335	0.004	−0.313	−0.000	−0.108
SE(Treatment + Interaction)	0.003	0.236	0.005	0.253	0.002	0.180
p-value(Treatment + Interaction)	0.745	0.155	0.483	0.216	0.945	0.550
First Stage F-stat		63.356		63.356		63.356

Notes: Coefficients are standardized. Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%.

Table B. 4: Effects of Imports on Intra-State Conflict

Dependent variable: Intra-state Conflict	Civil War Indicator (Haber, Menaldo et al., 2011)		Percentage of Years of civil War (Haber, Menaldo et al., 2011)		Intra-state War Indicator (Corr. of War)		Percentage of Years of Intra-state War (Corr. of War)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(Imports)	0.002		0.002		-0.000		0.001	
	(0.005)		(0.003)		(0.005)		(0.003)	
log(Imports) X Land Abundant	0.000		-0.002		-0.000		-0.002	
	(0.007)		(0.003)		(0.007)		(0.003)	
log(Exogenous Imports)		0.004		0.010		0.005		-0.013
		(0.096)		(0.040)		(0.088)		(0.042)
log(Imports) X Land Abundant		-0.354*		-0.141		-0.238		-0.139
		(0.200)		(0.094)		(0.190)		(0.098)
Observations	202	202	202	202	202	202	202	202
Country FEs	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓
Treatment + Interaction	0.003	−0.350*	0.001	−0.131	−0.001	−0.233	−0.000	−0.152
SE(Treatment + Interaction)	0.003	0.209	0.001	0.096	0.003	0.187	0.002	0.103
p-value(Treatment + Interaction)	0.465	0.094	0.678	0.171	0.834	0.214	0.776	0.139
First Stage F-stat		63.356		63.356		63.356		63.356

Notes: Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%. [a] Standardize beta coefficients.

Table B. 5: Effect of Tariff Revenues and Trade Imports on Various Democratization Measures

Dependent variable:	Equal Competition Index		Equal Protection Index		Polyarchy Index		V-Dem Participatory Democracy Index		Share of Population with Suffrage		Vanhannen's Competition Index		Vanhannen's Political Participation Index		Polity IV	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
log(Tariff Revenues)	0.329*		0.080		0.249		0.225		0.258		0.344		0.399		0.120	
	(0.151)		(0.142)		(0.154)		(0.176)		(0.332)		(0.245)		(0.345)		(0.226)	
log(Tariff Revenues) X Land Abundant	-0.323*		-0.086		-0.259		-0.251		-0.290		-0.350		-0.407		-0.133	
	(0.148)		(0.140)		(0.153)		(0.178)		(0.327)		(0.247)		(0.346)		(0.227)	
log(Exogenous Tariff Revenues)		0.204		0.215		0.041		-0.115		-0.146		0.295		0.091		0.131
		(0.155)		(0.140)		(0.193)		(0.198)		(0.297)		(0.239)		(0.268)		(0.189)
log(Exogenous Tariff Revenues) X Land Abundant		-0.299*		-0.095		-0.387**		-0.337**		-0.562**		-0.352		-0.289		-0.214
		(0.153)		(0.131)		(0.161)		(0.167)		(0.233)		(0.256)		(0.332)		(0.240)
Observations	202	202	202	202	198	198	198	198	202	202	165	165	157	157	166	166
Country FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Treatment + Interaction	0.007	−0.094	−0.006	0.120*	−0.010	−0.346	−0.026	−0.452	−0.031	−0.709*	−0.005	−0.057	−0.008	−0.197	−0.013	−0.083
SE(Treatment + Interaction)	0.007	0.082	0.006	0.066	0.009	0.312	0.023	0.340	0.020	0.401	0.020	0.274	0.013	0.370	0.007	0.222
p-value(Treatment + Interaction)	0.381	0.249	0.326	0.070	0.294	0.268	0.295	0.184	0.175	0.077	0.801	0.835	0.543	0.594	0.126	0.709
First Stage F-stat		63.356		63.356		63.356		63.356		63.356		63.356		63.356		63.356

Notes: Coefficients are standardized. Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%.

Table B. 6: Effect of Tariff Revenues on Inter-State Conflict

Dependent variable:	Inter-state War Indicator (Corr. of War)		Avg. deaths in Inter-state War(s) (Corr. of War) [a]		Perc. of Years on Inter-state War(s) (Corr. of War)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
log(Tariff Revenues)	-0.034		0.271		-0.034	
	(0.089)		(0.362)		(0.089)	
log(Tariff Revenues) X Land Abundant	0.031		-0.272		0.031	
	(0.084)		(0.367)		(0.084)	
log(Exogenous Tariff Revenues)		0.091		0.342		0.091
		(0.100)		(0.293)		(0.103)
log(Exogenous Tariff Revenues) X Land Abundant		0.176		-0.460		0.176
		(0.146)		(0.967)		(0.145)
Observations	202	202	202	202	202	202
Country FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Treatment + Interaction	−0.003	0.267	−0.002	−0.118	−0.003	0.267
SE(Treatment + Interaction)	0.028	0.209	0.027	1.172	0.028	0.209
p-value(Treatment + Interaction)	0.903	0.201	0.945	0.920	0.903	0.202
First Stage F-stat		63.356		63.356		63.356

Notes: Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%.[a] Avg. deaths in internal war are standardized.

Table B. 7: Effect of Tariff Revenues on Political Participation controlling for inter-state wars

Dependent variable:	Equal Access Index		Power distributed among socioeconomic groups		Power distributed among social groups	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
log(Tariff Revenues)	0.579**		0.389**		0.464**	
	(0.178)		(0.144)		(0.167)	
log(Tariff Revenues) X Land Abundant	-0.560**		-0.349**		-0.460**	
	(0.171)		(0.138)		(0.165)	
log(Exogenous Tariff Revenues)		0.115		0.001		0.192
		(0.219)		(0.157)		(0.204)
log(Exogenous Tariff Revenues) X Land Abundant		-0.485**		-0.386**		-0.313**
		(0.200)		(0.194)		(0.157)
Observations	202	202	202	202	202	202
Country FEs	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓
Lagged Inter-State War	✓	✓	✓	✓	✓	✓
Treatment + Interaction	0.019	−0.370***	0.040	−0.385*	0.005	−0.121
SE(Treatment + Interaction)	0.013	0.127	0.029	0.214	0.005	0.119
p-value(Treatment + Interaction)	0.204	0.004	0.218	0.072	0.394	0.309
First Stage F-stat		63.356		63.356		63.356

Notes: Coefficients are standardized. Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses. Significance-level: *** 1%; ** 5%; and * 10%.

Table B. 8: Effect of Tariff Revenues on Intra-State Conflict controlling for Inter-State Wars

Dependent variable:	Civil War Indicator (Haber, Menaldo et al., 2011)		Percentage of Years of civil War (Haber, Menaldo et al., 2011)		Intra-state War Indicator (Corr. of War)		Percentage of Years of Intra-state War (Corr. of War)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(Tariff Revenues)	0.084		0.017		0.042		0.008	
	(0.110)		(0.027)		(0.102)		(0.030)	
log(Tariff Revenues) X Land Abundant	-0.082		-0.016		-0.025		-0.004	
	(0.119)		(0.028)		(0.099)		(0.030)	
log(Exogenous Tariff Revenues)		0.003		-0.003		-0.011		-0.018
		(0.120)		(0.027)		(0.124)		(0.035)
log(Exogenous Tariff Revenues) X Land Abundant		-0.421**		-0.096**		-0.205		-0.079
		(0.169)		(0.044)		(0.201)		(0.065)
Observations	171	171	171	171	171	171	171	171
Country FEs	✓	✓	✓	✓	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Inter-State War	✓	✓	✓	✓	✓	✓	✓	✓
Treatment + Interaction	0.002	−0.418***	0.001	−0.099**	0.016	−0.216	0.004	−0.097
SE(Treatment + Interaction)	0.021	0.160	0.004	0.041	0.015	0.192	0.004	0.069
p-value(Treatment + Interaction)	0.920	0.009	0.734	0.015	0.336	0.260	0.265	0.163
First Stage F-stat		63.356		63.356		63.356		63.356

Notes: Country and year cluster-robust standard errors adjusted for small number of clusters using Wild bootstrap in parentheses.
Significance-level: *** 1%; ** 5%; and * 10%. [a] Standardize beta coefficients.