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**The Political Economy of Imperialism,
Decolonization, and Development**

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Abstract

Nations have historically sought power and prosperity through control of physical space. In recent decades, however, territorial empire has largely ceased. Most states that can take and hold territory no longer appear eager to do so, while the weak are unable to expand. Have powerful countries become “kinder and gentler,” or has something fundamental changed about the logic of empire? We offer a theory of imperialism and decolonization that explains both historic cycles of expansion and decline and the demise of the urge to colonize. Technological shocks enable expansion, while military technology gradually disseminates, diluting imperial advantage. At the same time, economic development has led to a secular decline in the payoffs for appropriating land, minerals, and reluctant labor. Once conquest no longer pays for great powers, the systemic imperative to vertically integrate production also becomes archaic.

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Other nations in history have fought in foreign lands and remained to occupy and exploit. Americans, following a battle, want nothing more than to return home – George W. Bush

1 Introduction

Two US wars in the Middle East have reawakened discussions of American Empire (Johnson 2001, 2004; Bacevich 2002; Ferguson 2004). In stark contrast to traditional patterns, however, the United States appears to have no desire to actually acquire more *territory*. Whether empire requires physical expansion and colonization, or simply “effective control” of another society (Doyle 1986, page 30), seems to us to be largely definitional.¹ Labeling US motives and practices as imperial, hegemonic, or something else² is perhaps less critical than attempting to understand why such behavior exists and evolves over time. We seek to explain the acquisition or abandonment of colonial holdings, offering an account that ties together the rise and fall of territorial expansion with the current US penchant for influence rather than long-term occupation. Developed nations exhibit little of the traditional preoccupation with obtaining land and resources through force. The appeal of colonial holdings evaporated for leading nations by the mid-twentieth century. Rather than reflecting an exception to traditional tendencies, US efforts represent a secular change in the imperatives of power; owning land or minerals matters much less than guiding the global commons.

One of the defining characteristics of the modern world has been the cycle of European empire. In it, the familiar pattern of expansion and contraction is readily discernible (c.f. Gibbon 1993[1776], Spengler 1932, Modelski 1987). Yet, while acts viewed as “imperialist” may persist today, no nation or set of nations have come forward to pick up the gauntlet of empire. The world’s richest and most powerful countries show little interest in the continuous administration of foreign territory, as opposed to attempting to influence, intimidate, or coerce foreign sovereigns and polities. These same powers are also vigorously opposed to allowing other countries to pursue any territorial ambitions.

¹Ferguson (2003c, pages 160-161) prefers empire to hegemony. “To compare . . . the United States and the United Kingdom as hegemonies is to miss differences that become obvious when the two are compared as empires.” Distinguishing between US hegemony and British empire would highlight differences Ferguson emphasizes. “A century ago, the United Kingdom’s formal empire was very large indeed, covering nearly a quarter of the world’s surface and ruling roughly the same proportion of its population. Today, on the other hand, the United States’ formal empire includes just 14 dependencies (of which the largest is Puerto Rico) and covers less than 11,000 square kilometers.”

²President Hugo Chavez of Venezuela recently claimed in the United Nations that the US was led by “the devil.”

What some have labeled a norm of territorial integrity (Zacher 2001, Fazal 2007) seems to us to require further explanation. What motivates an end of empire? Can we expect this phenomenon to continue or will the future repeat historical patterns of imperial growth and decay “all over again”? If we are to accept “American Exceptionalism,” then perhaps international relations will someday return to patterns of the not-so-distant past. China or India, for example, might use growing economic and military potential to expand at the expense of their neighbors. Alternately, rising powers may find that control of physical space is best accomplished by proxy, ensuring that other countries conform to instructions from Beijing or Delhi, rather than by actually having to conquer, and administer, marginally productive places that are geographically distant from the metropol.

We offer a theory of imperialism and decolonization based on the dynamics of military technology and economic development. Random technology shocks create military advantages that gradually decay as insights or equipment disseminate, or as countermeasures are developed that degrade military advantage. Military technology shocks by themselves can explain the cycle of empire, but not the secular trend away from territorial expansion. A second feature, economic development, has led nations gradually to prefer commerce to conquest. Capital accumulation makes empire expensive, shifting incentives away from appropriating inputs to production and toward influencing the terms of trade. A third element explains the timing and rapidity of decolonization. Conquest imparts political control that invites the vertical integration of economic processes. Mercantilism in turn impels other countries to acquire or maintain colonies in order to access markets and inputs to production. This imperialist prisoners’ dilemma is reversed once influential actors prefer free market policies, allowing other countries to abandon empire as well. The theory predicts that territorial empire is archaic. Power in the modern world derives from productivity, rather than from raw materials. The lust for land could return, however, if inputs again become scarce, if military technology lowers occupation costs, or if powerful nations fail to maintain open markets.

2 Literature: Tropes of Empire

Lasting over three and one half centuries, the age of European imperialism profoundly shaped the modern world. The classical practice of territorial expansion virtually ended soon after World

War II, but the institutions and economies of the often contrived successor nations formed to manage abandoned colonial holdings remain heavily conditioned by their dependency (c.f. North 1981; Acemoglu, et al. 2001; Spruyt 2005). Territorial imperialism has been widely criticized both during (Hobson 1938[1905], Lenin 1970[1916], Orwell 1950, Sartre 2001) and after its formal practice (Said 1993, 1994, 2000; Johnson 2001, 2004; Chomsky 2003). Considerable attention also focused on the consequences of decolonization (Darwin 1988, Betts 1998). Yet, while many scholars examine the origins of empire (Smith 1981, Scammell 1989, Canny 2001, Black 2002), its practice (Gollwitzer 1969, Cain & Hopkins 1993*b*), or demise (Motyl 2001; Galtung et al. 1980; Galtung 1996; Springhall 2001), less effort has been devoted to relating historical cycles of expansion and decay to the secular, and precipitous, terminus of territorial empire in the mid-twentieth century.³

Explorations of contemporary imperialism seem more rhetorical and didactic than deductive or analytical (Johnson 2001, 2004; Ferguson 2004). Discussion of American empire has ebbed and flowed with shifting US power (Schlesinger 1986, Kennedy 1989), and with a variable landscape of international actors (Bacevich 2002). Careful research has focused on an evolving logic of hierarchy (Lake 1996, Cooley 2005), or on the role of U.S. hegemony in deterring territorial aggression (Zacher 2001, Fazal 2007). Absent is an account of why, in fact, things are not more like they used to be.

2.1 Explanations for Imperialism⁴

Theories seem to come in threes. Explanations for empire focus on the demand of the metropolis for riches, resources, markets, or jobs; on the supply of targets for conquest; or on system-level factors that condition colonial opportunities or demand. Hobson (1938[1905]), Lenin (1970[1916]) and others claimed that the imperial impetus comes from over-extended capitalism.⁵ Snyder (1991) views instead political and military elites as the cause of empire, while jingoistic propaganda deceives the masses. Dependency theorists shift the emphasis to political tensions and economic incentives

³Our argument is by no means incompatible with the view that moral suasion had a role in the end of empire (Jackson 1993, Crawford 2002). However, an emphasis on normative social reasons is perhaps overly congratulatory of the triumph of western ethics over western avarice (Spruyt 2000). Western civilization set aside ethical qualms for hundreds of years. The very dawn of empire is punctuated by the *encomiando*, a guarantee of Church protection for believers in the New World, but one that effectively gave authorities a free hand with indigenous populations.

⁴Our comments on the literature are necessarily brief. They are not intended as a thorough or balanced representation of available perspectives. Instead, we focus on contemporary debates and our own view of salient controversies.

⁵For reviews and criticism, see Fieldhouse (1961, 1967); Menom & Oneal (1986); Eckstein (1991); Wolfe (1997).

on the periphery (Gallagher & Robinson 1953, Dos Santos 1970, Galtung 1971, Caporaso 1998).⁶ Agents co-opted by the metropolis undermine developing nations. A third category of argument involves structural theories from realists (Waltz 1959, Gilpin 1981) to Marxist historians like Wallerstein (1979) to long cycle theorists (Modelski 1987; Modelski & Thompson 1988; Goldstein 1988; Thompson 1988; Chase-Dunn & Rubinson 1979; Chase-Dunn et al. 2000).⁷ Empires expand or contract in an organic fashion, responding in an unending cycle of world power or prosperity.

2.2 Explanations for Decolonization

Scholarship on the end of empire can also be grouped into supply-side, demand-side, and system-structural approaches. Some researchers emphasize domestic politics in the metropolis (Kahler 1984, Holland 1985). The need of landed nobles to provide employment for “second sons” may have dissipated with the rise of other more fungible forms of property. Alternately, democracy itself may have shifted the domestic political calculus. A second perspective emphasizes colonial resistance and/or the decline of the European educated “comprador” class of native elites (Easton 1964, Grimal 1978, Low 1991). Finally, other researchers favor international factors, such as the “demonstration effect” of initial Japanese victories over the western colonial powers in World War II, or the rise of an anti-imperialist bipolar system during the Cold War (McIntyre 1977, Lapping 1985).

2.3 Putting Together Growth and Decay

Students of world affairs have long been interested in the rise and fall of great powers (c.f. Gibbon 1993[1776], Mahan 1987[1890], Mearsheimer 2001). Again, three schools of thought offer insights.

The *World-Economy* approach has been particularly influential in conjunction with the dependency school of international political economy (Dos Santos 1970, Frank 1972). Inequality varies between core and periphery (Wallerstein 1974, 1983; Galtung 1971; Gidengil 1978; Chase-Dunn & Rubinson 1979; McGowan & Kordan 1981; Rasler & Thompson 1983). Economic stagnation leads to imperial conquest, while booms reduce interest in colonial holdings. The world-economy model

⁶For critiques of dependency arguments, see Gidengil (1978); Smith (1979); Weede & Tiefenbach (1981).

⁷Pollins & Murrin (1999) tie together long-cycle theory with theories of imperial growth and decline. For a review of long cycles research, see Rasler & Thompson (2000). For criticism, see Beck (1991), and Silverberg (2006).

thus pays more attention to long economic cycles than to the variable costs of colonial occupation.

Economic determinists (Marx 1975[1853], Hobson 1938[1905], Lenin 1975[1917]) stress that imperialism is the inevitable product of capitalist expansion. Changes in the economies of capitalist countries forced Western powers to seek dependencies that continue today in the post-colonial periphery (Gallagher & Robinson 1953, Magdoff 1969, Moran 1978). However, Marxist thinkers in particular are less interested in explicating the forces driving divestment of colonial holdings.

A third intellectual tradition, institutionalism, emphasizes political and social factors as the leading determinants of imperial growth and decay (Strang 1990, 1991a). Empire and decolonization result from shifting power relations among beneficiaries and those hurt by colonialism (c.f. Cohen 1973, Kahler 1981, Kimura 1995, Garoupa & Gata 2001). Competition is intensified by political liberalization in the metropolis (Kahler 1988), or by metropolitan cultural traditions (Pagden 1995, Armitage 2000). Yet, institutionalists face a heavy burden in explaining the persistent impotence of anti-colonialist ideas, as well as their sudden salience. Rapid decolonization, in a context of dramatic economic change suggests the value of economic incentives in bolstering institutionalist arguments. Indeed, as the other two approaches make clear, there is a sense that the colonial enterprise is fundamentally economic, even when other factors play significant roles.

Only a few studies attempt to explore intensively the micro-foundations for colonial expansion and decline. According to Grossman & Iyigun (1995), investments in colonies could be profitable due to monopoly rents, provided that the risk of insurrection is low.⁸ Increasing the insurrection technology or size of local populations could make colonization unprofitable, eventually triggering an abandonment of empire (Grossman & Iyigun 1997).⁹ Yet, these studies rely on largely exogenous changes in the colony to explain the end of empire. Nationalism (Gellner 1983) or insurgency (Fearon & Laitin 2003) could make colonialism more expensive. But these same challenges confront domestic sovereigns who nevertheless strive to retain power. It seems unlikely that these changes alone explain the rapid and nearly simultaneous divestment of colonial holdings. The question of whether imperial cycles persist or modernity trends away from empire remains to be answered.

⁸For a debate on “gentlemanly capitalism,” see Cain & Hopkins (1980, 1986), O’Brien (1999, 2000), White (2000).

⁹Oneal & Oneal (1988) show that colonial investments were profitable, while Frieden (1994) argues that approaches to investment and colonial control were interrelated. Most capital flowed to middle-income countries, rather than colonies (Clemens & Williamson 2000). See also Pollard (1985, 1987), Temin (1987), and Balasubramanyam (1989).

3 Territory Ain't What it Used to be: Cycles and Trends

We offer a theory combining the flow, ebb, persistence and demise of territorial empire that focuses on three factors. First, exogenous military technology shocks create the opportunity to reallocate territory through colonization.¹⁰ Second, occupation encourages mercantilist economic policies, in turn increasing incentives for other nations to acquire colonies. Finally, economic development produces a secular decline in the value of colonial holdings, while increasing the cost of occupation. We also examine other factors likely to influence the durability of empire, including metropolitan political liberalization and the effects of resistance movements and nationalism among colonies.

3.1 Military Technology: The Onset and Diffusion of Shock and Awe

Anecdote and logic suggest that the advent of empire is closely tied to the ability and incentive to project power (Fuller 1945; McNeill 1963, 1984, 1998; van Creveld 1989; Dupuy 1990). Empire generally begins with new military, economic, transportation, or logistical technology that suddenly allows one country to conquer and control other states or territories (Headrick 1981).¹¹ Technological shocks are thus a necessary, but not sufficient, condition for imperial expansion. Conversely, military and other advantages borne of technological innovation tend to diffuse over time. Targets of empire and third-party states have incentives to adapt, absorbing technologies and limiting or eliminating advantages of the imperial power (Buzan & Herring 1998, Krause 1992, Goldman & Andres 1999, Goldman & Eliason 2003).¹² Unless the imperial power continues to innovate, it eventually experiences relative decline (Gibbon 1993[1776], Kennedy 1989, Gilpin 1981). As one British historian describes, “we had a comparative advantage as an island seapower. It was then enlarged and sustained because we secured the further comparative advantage of being the world’s first industrial nation. These advantages first shrank and then disappeared” (Low 1991, page 6).

¹⁰Military advantage can lead to other forms of hierarchy, such as vassal states, which we do not explore here.

¹¹It is easy to overemphasize technology, or confuse its contribution to power projection with combat effectiveness. For discussions of the continuing importance of leadership, politics, and personnel see, Dupuy (1979); Millett, et al. 1986; Stam & Reiter (1998a, 1998b); Reiter & Stam (2002); Rotte & Schmidt (2003); Biddle (2004); Lieber (2005).

¹²Parker (1988, pages 118-120) discusses strategic military interplay between colonizers and indigenous populations. “The logic of Western superiority in fixed encounters had been thoroughly digested by the Indians: after their costly initial defeats, they were scrupulously careful to avoid pitched battles—much to the fury of the Europeans—because they always lost them. Only gradually did the Europeans recognize that the only way to beat the Indians was to adopt those same guerilla methods... But the Indians of New England were also learning fast” (1988, page 119).

European expansion and colonization took place in the context of dramatic increases in the administrative, transportation, and military technologies of European states (North & Thomas 1973, Bean 1973, Tallett 1997, Abernethy 2002). This transformation, and its consequences for European politics, are discussed elsewhere (c.f. Wallerstein 1980, Hobsbawm 1987, Tilly 1992, Schroeder 1994). Accounts of the origins of these technology shocks vary. Some authors argue that harsh competition pushed European powers to develop more powerful arms and armies (c.f. Downing 1992, Rogers 1995, Parker 1988, Boyd-Graber 2004).¹³ Others emphasize financial innovations which permitted powerful militaries, and particularly navies (Ferguson 2002, Glete 2002). Still other research identifies a symbiosis in which states promoted a European state system, which in turn privileged states (Spruyt 1994). For our purposes, identifying the origins of these innovations is less pertinent than explaining why these recurring technological shocks propelled adventurers, then conquering armies, to distant places and why this impetus later ebbed and evaporated, and has not returned.¹⁴

The cyclical nature of empire (Gibbon 1993[1776], Kennedy 1989), and of military advantage (Rasler & Thompson 1983, Holsti 1991), are well established, if somewhat stylized, empirical facts. What is less well understood is whether there exists variation in the motivation for empire. Some scholars argue that the urge to conquer is ubiquitous, occurring in all nations at all times and held in check only by the lack of technological advantage or martial expertise, or alternatively by mutual deterrence (Morgenthau 1948, Mearsheimer 2001). Alternately, one can conceive of the impetus to empire as particularistic, housed in the aspirations of individual leaders, and thus more the stuff of historical and biographical research than social science. We view the preference for territorial aggression as a variable driven by environmental conditions that can recur or trend over time.

A second aspect of military innovation involves specialization. Armies can be used to fight and win wars against other armies, or to control the populations and territories of subject places. Winning at war involves massing military power against critical elements of an opposing force (Jomini 1971[1838]). Controlling civilian populations involves exerting limited force in many places at once. Innovations in military technology presumably influence the classic elements of firepower, mobility, and protection (Liddell Hart 1946). While the last two elements increase the ability of a

¹³Thompson (1999) contrasts demand side arguments with variability in the supply side (the ease of conquest).

¹⁴For a discussion and debate on the origins of western military advantage see, Lynn (1996); Thompson (2006).

military force of a given size to exert combat power *and* to control a populated space, the first factor leads optimal force structure in different directions. Heavy (strategic) bombers and capital ships are ineffective tools for crowd control. The logic of conventional war increasingly demands relatively large allocations of capital. In contrast, the logic of conquest and control calls for “old fashioned” labor-intensive force structures—lots of soldiers with relatively little mechanization. The divergence of optimal force structures should mean that sophisticated militaries, armies that tend to win the wars they fight, should be less and less effective as occupiers. To the degree that the determinants of battlefield and colonial effectiveness differ, and to the extent that resources available to the military are finite, nations contemplating colonizing another country must choose between a military that is optimized for conventional combat, and a force structure intended primarily for occupation.

3.2 Economic Development: When Empire Pays, and When it Does Not

One of the central debates in the study of imperialism is over whether (or how much) nations profit from empire (Lieberman 1996; Brooks 1999, 2005; Ferguson 2003). While a number of studies provide evidence that colonies were a net economic benefit, at least over certain periods (Fieldhouse 1973; Wolff 1974; Marseille 1984; Offer 1993; Ferguson 2003a), scholars remain divided in their reading of the “balance sheet” of empire.¹⁵ In a very real sense, however, this debate is instrumental to our objectives in explaining the basic imperial dynamic. We note simply that colonial conquest offered a *perceived* economic benefit to key constituencies or decision makers. Subsequently, the value of empire declined. If colonial holdings were never profitable (we doubt this), then rising costs of control, or declining benefits from markets or resources would eventually make clinging to empire prohibitive. Alternately, if empire was never a net drain on the imperial exchequer (we doubt this too), then plummeting profits must still weaken the forces of colonialism and embolden opponents. Social forces within the metropolis (i.e. democracy) or in the colony (i.e. nationalism) could also have tipped the balance sheet, but we discuss these later. The critical point here, which appears to be widely accepted, is that the economic benefits of empire declined over time (Doyle 1986).

Nations, like firms or individuals, must address their wants through some combination of pro-

¹⁵See, for example, Davis & Huttenback (1982, 1986), Cain & Hopkins (1987, 1993a), Porter (1988), O’Brien (1988).

duction, purchase, and theft (Tilly 1985, Hirshleifer 1989). Stealing is appealing when taking is more lucrative than making or trading (Olson 1993). Theft can be preferred to purchase or production when the technology of stealing (appropriation) is relatively advanced, when the inputs to theft are relatively abundant, and when that which is taken is relatively valuable. Within borders, muggings and other property crimes tend to be committed by unemployed or unskilled labor (Strasburg 1978, Sullivan 1989). Governments attempt to reduce the appeal of private theft by limiting access to the technology of appropriation (regulating firearms, explosives, lock smiths, etc.), by improving the productivity of non-appropriative labor (schools, vocational training), or by reducing the expected benefits of theft (police and prisons) (Becker 1968; Fajnzylber, et al. 2000).

In contrast, the international system lacks some of the tools available domestically to discourage appropriation (Grieco 1988, Lake 1996). Across international borders, governments or populations attempt to deter aggression by making conquest expensive (defense) or occupation unprofitable (nationalism, “scorched earth” policies). Countries cannot much alter the productivity of foreign labor, however, and typically nations control their own appropriative technology. International incentives for choosing production over predation thus depend heavily on environmental conditions, and on exogenous change (Hirshleifer 1978, 2001). If, for example, labor productivity rises in countries with the best appropriative technology, or if labor becomes scarce in these economies, while capital abundance drives down returns on appropriated (foreign) capital, then countries capable of conquest will no longer covet colonial holdings, though these countries may continue to use force in a punitive manner for other political (policy) reasons (Gartzke & Rohner 2009).

The question of whether to trade or take is one civilizations have confronted throughout history (Andrews 1984). Indeed, the two processes are linked. Vikings, the marauders of feudal Europe, were also the chief merchants of the era (Deutsch 1944). After robbing the churches and great houses, they often established trading posts, where less lucrative goods were bought and sold (Sawyer 1972, Jones 1984, Kurrild-Klitgaard & Svendsen 2003). Bank robbers often have bank accounts, while mobsters and petty criminals rob one person in order to pay another. Identifying how nations profit from particular combinations of trade and theft is central to the logic of empire.¹⁶

¹⁶Other factors, such as the symbolic value of territory (Fazal 2006), or geopolitical concerns (Spykman 1942, 1944) also influence the logic of empire. However, unless imperialism pays, it remains an extremely expensive past time.

3.3 The Imperialists' Dilemma: Mercantilism Made Me Do It

Imperialism creates a special opportunity for states to engage in anti-competitive economic behavior (Viner 1948). The metropole is in a position to determine whether trade will be allowed with third-parties (c.f. Porter 1994, Williams 1972, Irwin 1991, Ward 1994). These incentives extend beyond the colonial holdings of one particular country when vertically integrated mercantilist economies effectively limit the growth of non-imperialist states. Barriers to market entry and to raw materials in foreign colonies encourage nations to seek their own colonies and to adopt mercantilist policies.

Prisoners' dilemma beggar-thy-neighbor colonial policies ensured that industrializing states sought colonial holdings to gain access to markets and resources. As key imperial powers chose to prevent other nations from trading in their colonial hinterlands, nations experiencing follow-on industrialization were forced to choose between limited growth and entry into empire. The mad rush to conquer the remaining unclaimed portions of the globe followed, not so much because every property was profitable, but because staying home ensured that possible future profits would never arise. The process of territorial "crowding out" reversed itself once the predominant power no longer sought markets through colonial occupation, but instead used its leverage to open access.

Preliminary attempts by the United States to acquire colonial holdings suggest that Americans were not morally opposed to empire (Mahan 1987[1890], LaFeber 1963). Instead, relatively late industrialization and large internal markets meant that the US had a comparative advantage with free trade, while colonial expansion threatened war with Europe (Van Alstyne 1960, Zakaria 1998).

4 Modeling Imperialism

We construct three main versions of a game-theoretic model of imperialism: a basic model of the effects of military technology and economic development, a model of domestic political liberalization, and a third model that examines the role of system effects (mercantilism) in perpetuating empire. Supply-side arguments (nationalism, colonial populations) are modeled by varying the cost of appropriation. Additional treatments (the size of empire, insurgency) appear in two appendixes. We begin with two actors (N, S) that represent tribal groups, countries, or regions of the world.

4.1 The Basic Model

We can think of the potential for colonization as “lumpy.” A critical mass of fighting technology and labor is necessary before a state can achieve any result. Warships and adventurers were needed before Europe could discover, and then conquer, the New World. Even neighboring states must acquire some minimal level of capabilities to engage in territorial aggression. Appropriative activities thus only occur if the fighting technology ρ is higher than some arbitrary level $\hat{\rho}$. Formally, the restriction $\rho > \hat{\rho}$ ensures that a state projects power only when the threshold has been exceeded.

The production functions for actors N and S are displayed as equations (1) and (2) below:

$$y_N = \alpha L_N^a K_N^b \quad (1)$$

$$y_S = \beta L_S^c K_S^d \quad (2)$$

where y = production output, L = labor allocated to domestic production, K = physical capital and land stock, α, β = total factor productivities, and where a, b, c, d = exogenous parameters.

These production functions take the standard Cobb-Douglas form, where output depends on the two factors of production, capital K and labor L , which are complements and are subject to decreasing returns (i.e. $a < 1, b < 1, c < 1, d < 1$). Actors also have a time endowment normalized to 1 and choose a proportion of time to allocate to production and to appropriation or defense:

$$1 = L_i + F_i + D_i \quad (3)$$

where F = time devoted to appropriation, D = time used for defense, and where $i \in [N, S]$.

Imagine that N develops a technological advantage. Europe’s historical turning point began in the late feudal period when ideas and technology from the Muslim world diffused through Europe and sovereigns began to consolidate political and military power (Lewis 1982, 1995). At this stage neither N nor S had reached the technological threshold for overseas conquest ($\rho_S < \rho_N < \hat{\rho}$). By the 15th century, however, N reaches the threshold, while S remains below it, $\rho_S < \hat{\rho} < \rho_N$.

In the age of imperialism, $\rho_S < \hat{\rho}$. S cannot colonize N . Accordingly, S always chooses $F_S = 0$.

Thus, the time constraint of S becomes $L_S + D_S = 1$. Since N will not be attacked by S , N chooses $D_N = 0$ and its time constraint becomes $L_N + F_N = 1$. Thus, there is asymmetry in the incentive structure of the two players. This simplifies the analysis and reflects historical conditions.

Colonizing an opponent entails appropriating land and physical capital, assets that are valuable but which can either be bought or stolen. The prospects of colonization are endogenous in our framework and depend on the fighting efforts of N and S . We first discuss the potential corner solutions where one or both actors select zero fighting effort. Clearly, when $F_N = 0$, no colonization takes place. In this case there is no fighting and both actors just receive their own domestic production: N receives the entire y_N , and S the entire y_S . Further, if N makes a positive appropriation effort $F_N > 0$, but S fails to defend itself $D_S = 0$, we assume that N captures the whole production of both actors. Note, however, that in equilibrium we never observe $F_N > 0$ and $D_S = 0$, because S would always be better off selecting a positive defense level (as we discuss further below).

We next introduce the payoff functions for interior solutions when both players select positive fighting efforts, $F_N > 0$ and $D_S > 0$. We assume that the part of the land and physical capital in S captured by N depends on the difference between the fighting efforts of N and S . When F_N is much larger than D_S , we assume that on average N captures a large part of K_S , while N captures an intermediate portion of K_S when F_N and D_S are of similar size, and so on. Several studies use similar linear appropriation technologies (c.f. Rohner 2006; Besley and Persson 2009a, 2009b), allowing the use of production functions with decreasing returns to labor and capital (i.e. Cobb-Douglas), while keeping the model tractable. As actors trade off concave production gains with linear appropriation gains, there is always a unique interior optimum involving positive fighting levels of both players. Formally, equation (4) represents the payoff (utility) function for actor N :

$$V_N = \alpha L_N^a K_N^b + \left[\frac{1}{2} + \theta(\rho_N F_N - \rho_S D_S) \right] K_S \quad (4)$$

where ρ = the fighting technology ($0 < \rho < 1$), θ = a parameter ($0 < \theta < 0.5$).

N 's payoff equals its production output ($\alpha L_N^a K_N^b$), plus what capital and territory it “steals” from S . The term $\left[\frac{1}{2} + \theta(\rho_N F_N - \rho_S D_S) \right]$ is the “contest success function” (Hirshleifer 1989). As mentioned above, the greater the appropriation effort of N , and the lower the defensive effort of S ,

the more capital and territory N gains. The parameter θ refers to the decisiveness of the fighting effort. If $\theta = \frac{1}{2}$, fighting is perfectly effective in determining distribution, whereas if $\theta = 0$, time spent on fighting has no effect on the distribution of benefits (Rohner 2006). We also include a friction component to the fighting effort $(1 - \rho)$. Improvements in military technology (higher ρ) make appropriation more efficient, which also means that N has less to lose by fighting S .

Fighting technology ρ_N , resp. ρ_S can be seen as an increasing function of the total national factor productivity, denoted α , resp. β . We assume that ρ_N is a concave function of α , and ρ_S a concave function of β , as increases in the general technology level of a society result in less than proportional increases in fighting effectiveness. Technology requires military specialization, which optimizes force structures for battlefields versus riot control or counterinsurgency (Black 2000).¹⁷ Factors such as muscle power and the morale of personnel are also effectively fixed. Thus, doubling a country's weapons less than doubles the country's military strength. A functional form that reflects this reasoning is $\rho = k\alpha^\gamma$, where k =constant, $0 < \gamma < 1$.¹⁸

Introducing the time constraint $L_N + F_N = 1$ into N 's payoff function and solving for first order conditions, we obtain N 's optimal level of L_N :

$$L_N^* = \left(\frac{\alpha a K_N^b}{\theta \rho_N K_S} \right)^{\frac{1}{1-a}} \quad (5)$$

where L_N^* = the optimal level of L_N , and other variables or parameters are as described. For simplicity we will focus on parameter values for which $0 < L_N^* < 1$, which guaranties that there always exists an interior solution and which is the most interesting case for our research question.

Note that this interior L_N^* is the unique solution in the basic framework. An equilibrium of no appropriation and no defense would not be sustainable as N would always have incentives to deviate and choose some positive level of appropriation. Similarly, for positive appropriation efforts of N also S would always have incentives to select positive levels of defensive activities.

N 's optimal production level increases with total factor productivity, and decreases with fighting

¹⁷An ever smaller proportion of states are able to integrate military technologies effectively (Biddle 1998). Conversely, forces optimized for conventional battle are at a comparative disadvantage in asymmetric warfare.

¹⁸One could also imagine that fighting technology decays in the distance between metropolis and colony: $\rho = \rho(\bar{d})$, where d = distance, or assume a specific function, as in the gravity model: $(1 - \rho) = \omega d^2$, where ω is exogenous.

technology. Productivity increases encourage domestic production, while increases in military power make appropriation more appealing. The net effect of production technology on labor time is positive, however, as productivity increases less than proportionally increase fighting technology.

The payoff function for actor S follows a similar logic, with some differences, as S is the prey and not the predator of imperialism. S can either invest time into production or into defensive activities. Its payoff simply corresponds to its economic output that is produced using its remaining capital (the part which has not been appropriated by N) and its time devoted to labor. Formally:

$$V_S = \beta L_S^c \left\{ \left[\frac{1}{2} + \theta(\rho_S D_S - \rho_N F_N) \right] K_S \right\}^d \quad (6)$$

The part of K_S controlled by the imperialist N , $\frac{1}{2} + \theta(\rho_N F_N - \rho_S D_S)$, and the part maintained by S , $\frac{1}{2} + \theta(\rho_S D_S - \rho_N F_N)$, sum to 1. Including the time constraints, $L_S + D_S = 1$ and $L_N + F_N = 1$, and setting the first derivative of equation (6) with respect to L_S equal to zero, we obtain the reaction function for S :

$$L_S^* = \frac{c \left[\frac{1}{2} + \theta(\rho_S - \rho_N(1 - L_N^*)) \right]}{\theta \rho_S (c + d)} \quad (7)$$

where L_S^* = the optimal level of L_S , and other variables or parameters are as described.

As expected, S 's defense effort increases (lower L_S) in N 's colonization effort (lower L_N).

The first and second waves of European colonization (Latin America, Asia) can be explained using the basic model outlined above. The third wave of colonization involves system effects discussed below. As illustrated in Figure 1, threshold conditions initially constrain territorial empire. The level where domestic production technology reaches this first threshold (such that $\rho_N > \hat{\rho}$) is labelled α_1 . Incentives for empire then decay gradually with increasing productivity. Finally, colonialism collapses when development reaches α_2 . The rapidity in the fall of colonialism can be accounted for by fixed costs (see appendix A) or by democratization (see section 4.2).

Figure 1 reveals that the relationship between productivity (economic development) and efforts to acquire colonies is non-linear. Initially, development increases fighting technology, encouraging the pursuit of empire once threshold capabilities are achieved. As productivity continues to increase, however, and capital accumulates, incentives to appropriate decline (N prefers making to taking).

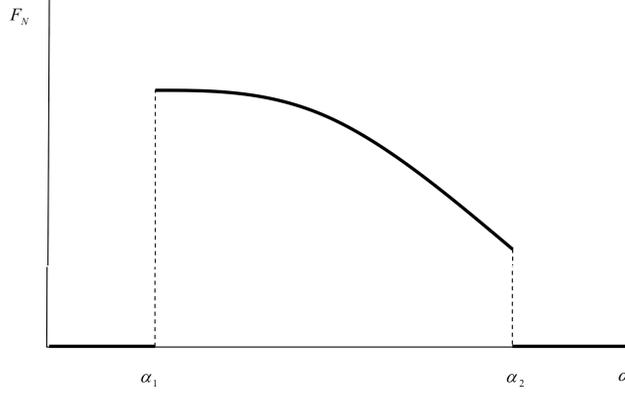


Figure 1: The level of colonization effort chosen by N

Hypothesis 1 *The effect of economic development on territorial empire should be strictly concave, first increasing, and then later decreasing the likelihood of a country possessing colonial holdings.*

The incentives for empire should also increase with military technology, though at a declining marginal rate. Technological advances initially increase appropriative potential, but advantages diffuse, while additional effort fails to yield equivalent increases in appropriative capacity.

Hypothesis 2 *The effect of military technology on territorial empire should be positive but declining, increasing appropriative potential at a diminishing marginal, spatial, and temporal rate.*

4.2 Political Liberalization

European democratization could have contributed to decolonization (Kahler 1984, Snyder 1991, Strang 1992). We next examine the possible effects of political liberalization on decolonization.

Appropriation and production decisions do not result from a plebiscite. Leaders and key political supporters may receive intense benefits from appropriation, even if empire is not socially optimal for the country as a whole. In the model below, the task of the government is to choose and impose a unified level of labor L which can be more or less close to socially optimal levels, but which is eventually adopted by both the population and the elite. This politically optimal level is found by optimizing equation (8), the payoff function for the government of N , with respect to labor L .

$$V_{GN} = \phi V_{PN} + (1 - \phi)V_{EN} - \zeta(V_{EN} - V_{PN}) \quad (8)$$

where V_{GN} = payoff function of the government of N , ϕ = relative weight attributed to the collective payoff function of the population, V_{PN} = payoff function of the population of N , V_{EN} = payoff function of the ruling elite of N , ζ = parameter capturing the costs of political instability.

The government cares about the payoff function of the population, as the leader wants to stay in power. However, for similar reasons it also cares about the payoff function of the ruling elite. The relative weight of the two payoff functions depends on the level of democratization (M). As a regime becomes more democratic, the weight attributed by the leader to the utility of the population increases, $\phi = \phi(M)^+$. A complete theory of democratization would endogenize ϕ in terms of other parameters or variables. Making ϕ exogenous serves our purposes here and simplifies exposition.

We also model the risk of political instability due to distributive conflicts that occur if relative payoffs of V_{EN} and V_{PN} are quite different. This is captured by the term $\zeta(V_{EN} - V_{PN})$, which we can represent as $\zeta(V_{EN} - V_{PN})$ rather than in absolute values, $\zeta |V_{EN} - V_{PN}|$, assuming conventionally that elites are richer, more productive, and can more easily capture rents from colonies: $\alpha_{EN} > \alpha_{PN}, K_{EN} > K_{PN}, \rho_{EN} > \rho_{PN}$. Elites have better access to business relationships (Cain & Hopkins 1993a) and to political power (Snyder 1991), extracting heavy rents from the country's colonial policies. If elites benefitted from empire at the expense of the larger population (Acemoglu 2003; Sorli, et al. 2005), or if democratization in Europe allowed moral sentiment to hold sway (Jackson 1990, Watson 1992), then democracy should lead to a decline in territorial empire.¹⁹

Given that the level of labor is imposed by the government, $L = L_{EN} = L_{PN}$, it follows from equation (4) that $V_{EN} > V_{PN}$, if the assumptions $\alpha_{EN} > \alpha_{PN}, K_{EN} > K_{PN}, \rho_{EN} > \rho_{PN}$ hold and if a_{EN} and a_{PN} , as well as b_{EN} and b_{PN} are of a similar magnitude. Introducing equation (4) for both the elite and the population into the government's payoff function (8), we obtain equation (9). The new variables x , y , and z are introduced to facilitate interpretation of the results. For the purposes of illustration only, we further assume that $a = a_{EN} = a_{PN}$ and $b = b_{EN} = b_{PN}$.

$$\begin{aligned}
 V_{GN} &= \phi(x_{PN}L^a - y_{PN}L + z_{PN}) + (1 - \phi)(x_{EN}L^a - y_{EN}L + z_{EN}) \\
 &\quad - \zeta(x_{EN}L^a - y_{EN}L + z_{EN} - (x_{PN}L^a - y_{PN}L + z_{PN}))
 \end{aligned} \tag{9}$$

¹⁹For claims that democracies are imperialistic, see Haas (1995); Galtung (1996); Henderson (2002); Spruyt (2005).

where $x_{PN} = \alpha_{PN}K_{PN}^b$, $y_{PN} = \theta\rho_{PN}K_S$, $z_{PN} = [\frac{1}{2} + \theta(\rho_{PN} - \rho_S D_S)] K_S$, $x_{EN} = \alpha_{EN}K_{EN}^b$, $y_{EN} = \theta\rho_{EN}K_S$, and where $z_{EN} = [\frac{1}{2} + \theta(\rho_{EN} - \rho_S D_S)] K_S$.

Taking first order conditions, we obtain equation (10), the optimal labor level set by government:

$$\begin{aligned} L_{GN}^* &= \left[\frac{a((\phi + \zeta)x_{PN} + (1 - \phi - \zeta)x_{EN})}{(\phi + \zeta)y_{PN} + (1 - \phi - \zeta)y_{EN}} \right]^{\frac{1}{1-a}} \\ &= \left[\frac{a((\phi + \zeta)\alpha_{PN}K_{PN}^b + (1 - \phi - \zeta)\alpha_{EN}K_{EN}^b)}{(\phi + \zeta)\theta\rho_{PN}K_S + (1 - \phi - \zeta)\theta\rho_{EN}K_S} \right]^{\frac{1}{1-a}} \end{aligned} \quad (10)$$

Note that for $x_{PN} = x_{EN}$ the result for L_{GN}^* is just identical to the result in equation (5): $L_{GN}^* = L_N^* = \left(\frac{\alpha a K_N^b}{\theta \rho_N K_S} \right)^{\frac{1}{1-a}}$. It is also interesting to see that political instability increases the weight attributed to the population's payoff. In fact, increases in ζ have exactly the same effect as increases in ϕ . By moving L closer to the population's optimum, inequality between elite and population is reduced, which decreases the government's loss from political turmoil.

Whether democratization (higher ϕ) leads to a higher or lower L_{GN}^* depends on the relative size of L_{EN}^* and L_{PN}^* , where $L_{PN}^* = \left(\frac{\alpha_{PN} a K_{PN}^b}{\theta \rho_{PN} K_S} \right)^{\frac{1}{1-a}} = \left(\frac{a x_{PN}}{y_{PN}} \right)^{\frac{1}{1-a}}$ and $L_{EN}^* = \left(\frac{\alpha_{EN} a K_{EN}^b}{\theta \rho_{EN} K_S} \right)^{\frac{1}{1-a}} = \left(\frac{a x_{EN}}{y_{EN}} \right)^{\frac{1}{1-a}}$. Assuming that elites are richer ($K_{EN} > K_{PN}$), and more productive ($\alpha_{EN} > \alpha_{PN}$), implies that $x_{EN} > x_{PN}$. Assuming that elites extract more of the rents from colonies ($\rho_{EN} > \rho_{PN}$) implies that $y_{EN} > y_{PN}$. Whether on the whole L_{EN}^* is greater or smaller than L_{PN}^* depends on the relative size of the wealth-productivity effect on one hand (x_{EN} versus x_{PN}) and of the rent-extracting effect (y_{EN} versus y_{PN}) on the other. If the difference in wealth and productivity is large, but elites are much better at extracting rents ($y_{EN} \gg y_{PN}$), then $L_{EN}^* < L_{PN}^*$. This implies that democratization (a larger ϕ) reduces colonization, as the greater weight of L_{PN}^* increases L_{GN}^* .²⁰

Colonial holdings could have continued to profit elites even if they produced losses overall. Rapid decolonization can be explained by economic factors alone (see Appendix 1), but political liberalization could also have played a role. We must rely on empirical assessment to determine what mix of factors triggered decolonization. Domestic politics suggests the following hypothesis:

Hypothesis 3 *Democracies should be less likely to possess (or to seek to acquire) colonies.*

²⁰Economic development results in higher values of $\alpha_{EN}, \alpha_{PN}, \rho_{EN}, \rho_{PN}$, which increases $x_{EN}, x_{PN}, y_{EN}, y_{PN}$, though not necessarily at the same rate. The net effect of democracy thus varies with time and development.

4.3 Accounting for System Effects

The logic of empire may be conditioned as well by system-level variables. The structure of the global economy is affected by the choices of multiple nations. While free markets are socially optimal, individual states often have incentives to engage in anticompetitive policies (Conybeare 1987). Countries may pursue or perpetuate colonial holdings if other countries inhibit free trade or capital.

Parsimonious models explain particular relationships, while omitting others. Different models also reflect competing claims in the literature and allow us to compare the implications of different assumptions. We next relax the assumption of a single imperialist country, including two players $N1$ and $N2$, that compete over access to S . We use the Nash equilibrium solution concept to solve a game in which the two imperialist countries choose between producing (L), and fighting (F).

$$L_i + F_i = 1, \text{ with } i = N1, N2. \quad (11)$$

Equation (12) displays the payoff function of country $N1$ ($N2$'s payoff function is analogous):

$$\begin{aligned} V_{N1} = & L_{N1}(A + B \left[\frac{1}{2} + \psi(\rho_{N1}F_{N1} - \rho_{N2}F_{N2}) \right] (1 - \lambda D_S)) \\ & + \left[\frac{1}{2} + \psi(\rho_{N1}F_{N1} - \rho_{N2}F_{N2}) \right] (1 - \lambda D_S)K_S \end{aligned} \quad (12)$$

where A = marginal productivity of labor, B = potential marginal gains from trade, ψ = parameter related to the decisiveness of the fighting effort (with $0 < \psi \leq 0.5$), ρ = the fighting technology ($0 < \rho < 1$), and λ = a parameter related to the defensive technology of player S .

Equation (12) has the same overall structure as equation (4). However, since including a second colonial power increases model complexity, we simplify other aspects to keep the model tractable.²¹

The payoff for country $N1$ is composed of three elements. First, there are returns on productive activities, which are increasing in the parameter A . Second, there are gains from trade that increase in the parameter B and in the portion of country S that is controlled by $N1$, $(\frac{1}{2} + \psi(\rho_{N1}F_{N1} - \rho_{N2}F_{N2}))(1 - \lambda D_S)$.²² Treating S as divisible can be interpreted as the portion of the developing

²¹These simplifying assumptions are not critical to the main results of the model.

²²We again focus on the unique interior Nash Equilibrium with $F_{N1} > 0$, $F_{N2} > 0$.

world controlled by a given imperialist power. Mercantilism attempts to restrict trade with a given colony to the colonial power. Thus, if one country ($N1$) acquired all of S , $N2$ would not trade.

The portion of country S that is colonized is represented by $(1 - \lambda D_S)$. Given that the focus here is on the interaction between $N1$ and $N2$, we treat D_S as exogenous. The part of this colonized fraction of S that is controlled by $N1$ and that can be used as an exclusive trade partner is specified by the difference-form contest success function $(\frac{1}{2} + \psi(\rho_{N1}F_{N1} - \rho_{N2}F_{N2}))$. The parameter ψ reflects how decisive fighting is in determining the division of the colony. If $\psi = 0$, fighting does not affect the division of resources. For $\psi = 0.5$, fighting is fully decisive. We assume that fighting has some strictly positive effect (i.e. $\psi > 0$). The logic of this contest success function parallels the basic model. When F_{N1} is larger than F_{N2} , $N1$ receives a greater share of the colony, and vice versa.

The third component of country $N1$'s payoff is the portion of the value of the colony, K_S , that it captures through fighting. Fighting for colonies against rival imperialist powers results in a direct benefit, the portion of K_S gained, and in an indirect benefit, the possibility of trade. The profit from appropriation must be balanced against productive income lost due to friction from conflict.

Introducing players' time constraints (11) into $N1$'s payoff function (12), we get equation (13):

$$\begin{aligned} V_{N1} = & L_{N1}(A + B \left[\frac{1}{2} + \psi(\rho_{N1}(1 - L_{N1}) - \rho_{N2}(1 - L_{N2})) \right] (1 - \lambda D_S)) \\ & + \left[\frac{1}{2} + \psi(\rho_{N1}(1 - L_{N1}) - \rho_{N2}(1 - L_{N2})) \right] (1 - \lambda D_S) K_S \end{aligned} \quad (13)$$

Setting the first derivative of equation (13) with respect to L_{N1} equal to zero and expressing the result in terms of L_{N1} , we find the optimal value of L_{N1} displayed in the reaction function (14). The solution is analogous for player $N2$. Note that these are the results for an interior solution. Corner solutions follow from the fact that neither variable can become negative, $L_{N1} \geq 0, F_{N1} \geq 0$:

$$L_{N1}^* = \frac{A + B(\frac{1}{2} + \psi(\rho_{N1} - \rho_{N2}))(1 - \lambda D_S) - \psi \rho_{N1} K_S (1 - \lambda D_S)}{2B\rho_{N1}\psi(1 - \lambda D_S)} + \frac{\rho_{N2}L_{N2}^*}{2\rho_{N1}} \quad (14)$$

where L_{N1}^* , resp. L_{N2}^* are the optimal levels of L_{N1} , resp. L_{N2} .

According to equation (14), the proportion of labor time $N1$ devotes to production increases in its productivity (A), and decreases with a more attractive target (higher K_S). These findings

are both consistent with the basic model, but in addition, systemic competition now creates an “imperialist race.” The more time $N2$ spends on productive activities (higher L_{N2}), the more time country $N1$ devotes to production. Conversely, when country $N2$ puts time effort into fighting, country $N1$ does so also. Thus, colonization by one power induces imperialism in other states:

Hypothesis 4 *A country is more likely to hold colonies when the system contains many colonies.*

The strategic interaction between the two imperialist countries $N1$ and $N2$ is illustrated in Figure 2.²³ The grey (black) lines represent the reaction function of country $N1$ ($N2$). The solid (dashed) lines correspond to a case of low (high) productivity, $A = 0.16$ ($A = 0.24$). The Nash equilibrium for the solid lines is at $(0.5;0.5)$, and is $(0.75;0.75)$ for the dashed lines. The reaction functions for both countries are positively sloped, indicating that each country increases its production effort for increases in the productive effort of the other state. This also means that a state increases its colonization effort for increases in the colonial activity of the other power.

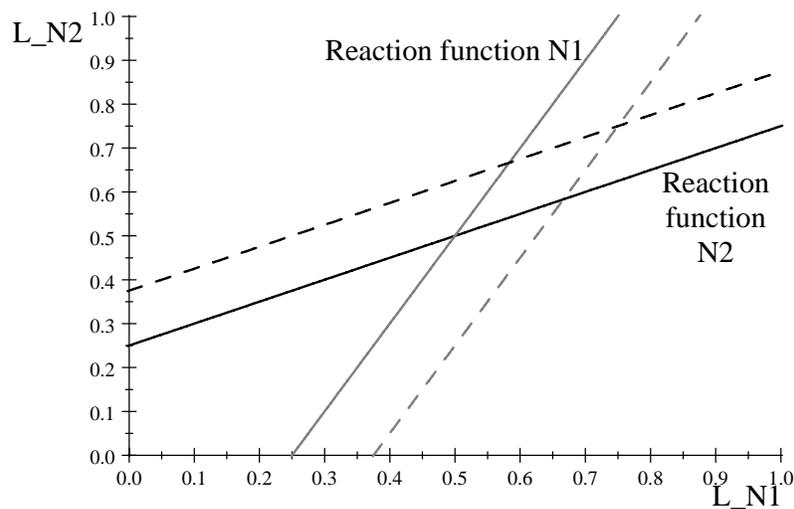


Figure 2: The reaction functions of the countries $N1$ and $N2$

A slight extension of the systemic model helps to explain how the move from mercantilism to freer global markets helped to trigger rapid decolonization. Up to now we have assumed that

²³The following parameter values are used for the solid lines (they are symmetrical for both players): $A = 0.16$, $B = 0.8$, $K_S = 1$, $\psi = 0.4$, $\rho_{N1} = \rho_{N2} = 1$, $\lambda = 0.5$, $D_S = 0$. For the dotted lines we have $A = 0.24$.

all gains from trade depend on the territorial control of trade partners (mercantilism). We can now allow that only a part γ of the trade gains depend on possession of colonies. The move from mercantilism to capitalism and freer trade is reflected by a gradual decrease in γ .²⁴

We introduce the possibility of partially free trade, by changing equation (12) into (12') below:

$$V_{N1} = L_{N1}(A + B(1 - \gamma) + B\gamma \left[\frac{1}{2} + \psi(\rho_{N1}F_{N1} - \rho_{N2}F_{N2}) \right] (1 - \lambda D_S)) \\ + \left[\frac{1}{2} + \psi(\rho_{N1}F_{N1} - \rho_{N2}F_{N2}) \right] (1 - \lambda D_S)K_S \quad (12')$$

All variables are defined as before. The parameter γ can be interpreted as the level of mercantilism. Naturally, the results for $\gamma = 1$ are identical to the results presented above. By contrast, $\gamma = \varepsilon$ (where ε is an infinitely small positive number) corresponds to a capitalist free trade system.

Introducing the time constraints (11) in (12') and computing the first-order conditions, we get:

$$L_{N1}^* = \frac{A + B(1 - \gamma) + B\gamma(\frac{1}{2} + \psi(\rho_{N1} - \rho_{N2}))(1 - \lambda D_S) - \psi\rho_{N1}K_S(1 - \lambda D_S)}{2B\gamma\rho_{N1}\psi(1 - \lambda D_S)} + \frac{\rho_{N2}L_{N2}^*}{2\rho_{N1}} \quad (14')$$

We can evaluate the effect of mercantilism and capitalism on incentives for imperialism and decolonization by looking at the first derivative of L_{N1} with respect to γ . A negative first derivative implies that more capitalism (lower γ) increases the incentives to produce (higher L_{N1}) and accordingly reduces the incentives to fight (lower F_{N1}) to gain or retain control of foreign territory or markets. The first derivative of L_{N1} with respect to γ becomes negative, if condition (15) holds:

$$A + B > \psi\rho_{N1}K_S(1 - \lambda D_S) \quad (15)$$

Condition (15) holds when the gains from production (A) and the gains from trade (B) are each large relative to the product of S 's capital endowment, the fighting technology of $N1$, and the pivotal nature of warfare. In the post-World War II period, the steady decay of barriers to trade, the relative poverty of developing countries, as well as the rise of nationalist insurgency movements made colonialism less appealing. Changes in the global economy had by the early 20th century

²⁴With γ in the denominator, the reaction function (14') is undefined when $\gamma = 0$. It makes sense to treat free trade as an absolute that is only approximated empirically (after multiple WTO rounds, trade is still not "free").

created conditions in which the economics of colonies, and the vertical integration of production networks, were increasingly ineffective. Sources for raw materials proliferated. The ascendance of the United States as hegemon further degraded the economic advantages of empire (Louis 1987).

Mercantilism can be proxied empirically as a situation where the hegemon holds many colonies.

Hypothesis 5 *A country is more likely to hold colonies when the hegemon has many colonies.*

Development started with agricultural societies, moved through mercantilism, to be followed by capitalism. We expect the effect of systemic development on colonial holdings to be non-linear.

Hypothesis 6 *The effect of systemic development on territorial empire should be strictly concave, first increasing, and then later decreasing the likelihood of a country possessing colonial holdings.*

5 Research Design and Data

While our theory applies to broad swaths of history, our empirical analysis is limited by data availability to the last two centuries (1816-1992). Our unit-of-analysis is the country year. We examine both dichotomous (presence or absence) and ordinal (count) indicators of colonialism/decolonization. For the dichotomous dependent variable, we rely on ReLogit (King & Zeng 2001a, 2001b).²⁵ We use negative binomial regression to estimate the number of colonies a country holds. We correct for spatial dependence using Huber/White robust standard errors. Independent variables are lagged by one year to address endogeneity. We also use Beck, et al. (1998) splines for duration dependence.

5.1 Dependent Variable

The dichotomous and count versions of the dependent variable come from two sources. Strang (1991b, Appendix) provides a list of the start and end years for a large number of dependencies beginning in the late 15th century. Strang includes dependencies that are not under colonial domination, and cases where political boundaries change over time. This could be a problem if dependencies operated under a different logic than colonies, or if dependencies experience reorganization, but not decolonization. These discrepancies are bound to weaken support for our claims.

²⁵Results are equivalent using logit. A Stata “do” file that replicates the analysis is available from the authors.

We also examine colony data from Ravlo, et al. (2003). These data are used as an independent variable by Ravlo and co-authors to argue that democracies are less warlike toward former colonies.

5.2 Independent Variables

- **Economic development:** Given the need to cover substantial time periods before the mid-Twentieth century, we adopt two variables widely used as proxies for per capita GDP (Lipset 1959; Burkhart & Lewis-Beck 1994; Hegre et al. 2001):²⁶ 1.) *Energy Cons./Pop.* comes from the COW National Material Capabilities dataset of total annual fuel consumption in coal-ton equivalents (Singer et al. 1972; Singer 1987; Correlates of War Project 2005). 2.) *Iron & Steel/Pop.* measures the quantity of iron or steel produced by a country in a given year.
- **Military Technology:** No convention exists as to the measurement of military technology. Dupuy (1979, 1987) advocated an index where each weapon is given a lethality score. The index requires detailed information that makes it unworkable here. We adopt an admittedly much simpler instrument for measuring military technology, by dividing defense spending from the Correlates of War National Material Capabilities dataset (CINC) by the number of military personnel by country per year.²⁷ The result is a statistic analogous to GDP per capita identifying which armies have advanced weaponry, etc, and which do not.
- **Democracy:** Polity data provide indexes based on formal constraints on the executive (AUTOC) and institutional support for democracy (DEMOC) (Jagers & Gurr. 1995, Gurr et al. 1989). We prepare monadic values by combining DEMOC and AUTOC scales as follows, $[(DEMOC_i - AUTOC_i) + 10]/2$, (where $i \in [A,B]$). We add 10 to make all values non-negative and divide by 2 to yield a 0–10 index. We examine both the monadic values and higher and lower democracy scores for each state in each dyad (Oneal et al. 2003; Oneal & Russett 1999).
- **Capabilities:** Capabilities determine the ability of states to project power and conduct warfare

²⁶The close fit between GDP and energy usage was weakened by the oil shocks in the 1970s. Since our measures therefore underreport development, reported estimates will tend to understate support for the hypotheses.

²⁷COW provides military expenditure figures in nominal (current year) British pounds (1816–1913) and US dollars (1914–2000). We used GDP deflators available at *EH.net*, (URL: <http://eh.net/hmit/>) to obtain constant (2000) dollars (Johnston & Williamson 2005; Officer 2004, 2005). Additional details are available from the authors.

independent of national income. We assess capabilities in the dyad using the Correlates of War (COW) Composite Indicators of National Capabilities (CINC) score. CINC scores are computed as the weighted average of a state's share of total system population, urban population, energy consumption, iron and steel production, military manpower and military expenditures. *CINC* represents the CINC score for each state in the directed dyad.

- *Major Power Status*: Major powers tend to be more active internationally, resulting in more frequent conflict behavior. Since they may also tend to be more prosperous, there is a danger that the relationship between development and conflict might be confounded by major power politics. We include a dummy variable, *Maj. Power*, coded (1) for the major powers.
- *Temporal Dependence*: Finally, we control for temporal dependence using the Beck et al. (1998) technique. We construct four splines for each dependent variable, interpolated from a dummy matrix coding the lag between directed dyad years of conflict initiation or onset.

6 Results

The results of our analysis of development, technology, hegemony, and colonies are summarized in two tables containing eight regressions. Each of the six regressions listed in Table 1 estimates the probability that an independent country possesses at least one colony. Succeeding models introduce additional variables to assess hypotheses, compare model specification, or examine robustness.

As Model 1 in Table 1 reveals, no simple linear relationship exists between either development (*Energy Cons./Pop.*) or military technology and colonialism. In contrast, democracy actually appears to precipitate imperialism. As the concave function in Figure 1 makes clear, a linear specification of development and military technology is inappropriate. Model 1 is mis-specified.

Model 2 adds quadratic terms for economic development and military technology. Both pairs of coefficients for civilian and military productivity are highly statistically significant. *Energy Cons./Pop.* and its square suggest the concave function predicted by *Hypothesis 1*. The two terms for military technology appear to be reversed, with the linear term negative, while the quadratic is positive. However, since the quadratic coefficient is over 2.5 times as large as the linear term

Table 1: The Political Economy of Decolonization (Relogit estimator [King & Zeng 2001a, 2001b])

D.V.: Colonies	—— Strang (1990) ——			—— Ravlo, et al. (2003) ——		
	1	2	3	4	5	6
Indep. Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
	(S.E.)	(S.E.)	(S.E.)	(S.E.)	(S.E.)	(S.E.)
Energy Cons./Pop.	-0.011 (0.014)	0.976*** (0.270)	0.966*** (0.254)	1.391*** (0.270)	1.775*** (0.411)	1.812*** (0.406)
Energy Cons./Pop. ²		-0.070** (0.025)	-0.103*** (0.024)	-0.161*** (0.040)	-0.180*** (0.043)	-0.191*** (0.042)
Military Technology	-9.872 (7.710)	-42.621*** (13.337)	-49.602*** (14.417)	-73.105*** (11.949)	-75.648*** (18.597)	-83.461*** (19.809)
Military Technology ²		113.579*** (32.727)				
Energy × Mil. Tech.			6.253*** (1.765)	7.924*** (1.653)	9.079 [†] (5.003)	10.642* (5.189)
Regime Type	0.157*** (0.042)	0.060 (0.044)	0.060 (0.044)	0.034 (0.050)	-0.030 (0.058)	-0.010 (0.061)
# Colonies Hegemon				0.038*** (0.008)	0.022** (0.007)	
# Colonies System					4.515*** (1.077)	-6.296 (5.473)
Sys. Energy/Pop.						8.119** (3.120)
Sys. Energy/Pop. ²						-2.843* (1.118)
US Energy/Pop.						-1.720** (0.597)
US Energy/Pop. ²						0.137** (0.043)
CINC	19.628 [†] (11.408)	17.381 (10.879)	17.786 [†] (10.772)	42.589 [†] (24.084)	40.430 [†] (24.482)	38.471 [†] (22.498)
Major Power	1.232 (0.955)	1.039 (1.035)	0.973 (1.055)	1.003 (0.883)	0.945 (0.826)	0.935 (0.821)
# States in System						-0.057* (0.028)
# Major Powers						0.627*** (0.163)
Intercept	-0.425 (0.577)	-0.099 (0.610)	-0.014 (0.618)	-0.058 (0.551)	-2.359*** (0.731)	4.575 (5.024)
N	9671	9671	9671	10474	9830	9830

Sig. levels : † : 10% * : 5% ** : 1% *** : 0.1%. Coefficients and S.E.'s for spline variables suppressed.

(with similar means), the substantive effect of the positive quadratic coefficient is much larger than the linear term. The results for military technology are thus those predicted by *Hypothesis 2*, with military technology increasing the temptation to colonize, but at a declining marginal rate. In contrast, democracy does not appear to significantly determine decolonization (*Hypothesis 3*).

Note that neither conventional measure of power, *CINC* and *Major Power*, is significant in Model 2. Major power status remains statistically insignificant throughout Table 1, and in one of two models in Table 2. *CINC* is statistically significant, though at a very low threshold (10%). Intuition and popular folklore link colonial empire closely with large, powerful states. Colonization appears “democratic” in that productivity and military technology are not a product of state size.

It stands to reason that civilian and military productivity are related.²⁸ Model 3 adds an interaction term between *Energy Cons./Pop.* and *Military Technology*. As expected, *Dev. × Mil. Tech.* is statistically significant and positive. Both development variables remain largely unaffected, but *Military Technology*² is now insignificant and so is not included in this and subsequent models.

Figure 3 offers a three-dimensional plot of the predicted probability of an independent country possessing at least one colony based on Model 3. Development (*Energy/Pop.*) increases from left to right, while military technology (*Mi. Tech.*) increases from front to back in the image. The probability of colonial possessions is plotted on the vertical axis. The resulting plot looks roughly like a “grand piano,” “mesa,” or the bow of a ship (facing slightly right of the reader). Recall that in the formal model military technology is a declining function of development. Imagine beginning in the left foreground of the figure (low *Energy/Pop.* and *Mi. Tech.*) and moving in a diagonal line toward the most advanced countries (high *Energy/Pop.* and *Mi. Tech.*). The declining marginal impact of development on military technology leads the trajectory of a nation to veer right as we travel first up onto the piano/mesa/boat, and then down again onto the floor/valley/water on the right side of the figure. Notice also that the transition to and from colonialism is abrupt.

While we cannot reject *Hypothesis 1* or *Hypothesis 2* (or support *Hypothesis 3*), we have yet to examine the systemic and hegemonic effects outlined in the remaining hypotheses. Models 4 and 5

²⁸*Energy Cons./Pop.* and *Military Technology* are moderately correlated ($r \approx 0.3$). While linear and squared terms are highly correlated, multicollinearity is not indicated, as the linear terms are statistically insignificant by themselves, the non-linear variables are significant, other variables are unaffected, and theory dictates this specification.

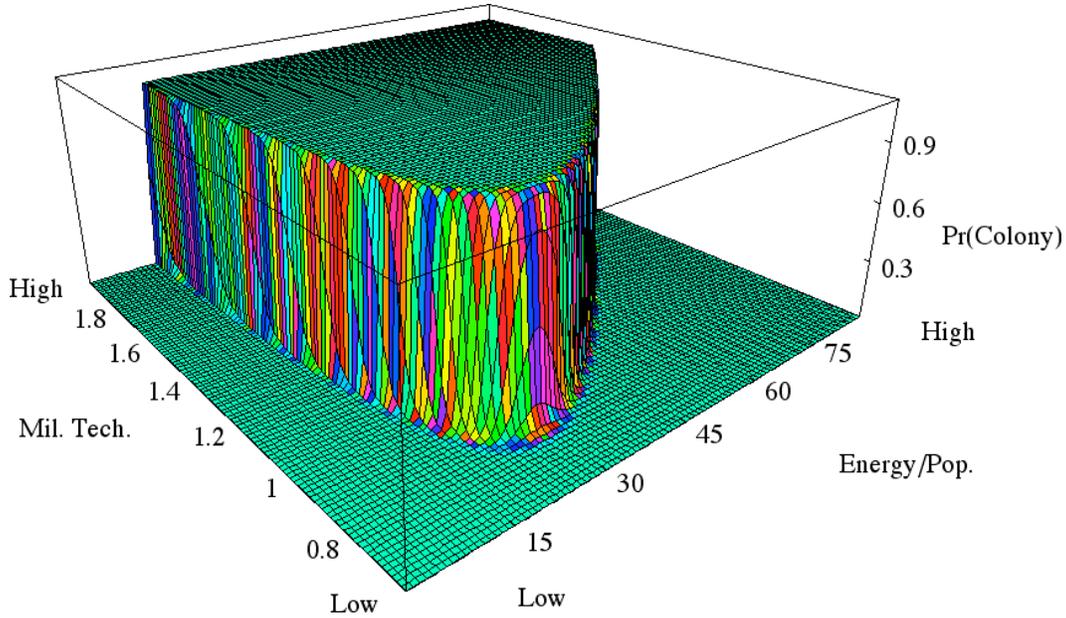


Figure 3: Estimated Effects of Development and Military Technology on Empire (Model 3)

in Table 1 introduce variables for the number of colonies held by the hegemon (*Hypothesis 5*) and the number of colonies in the system (*Hypothesis 4*). Neither hypothesis can be rejected.²⁹

Model 6 completes Table 1 by introducing variables to evaluate systemic development, the effects of the United States as hegemon, and to control for factors relevant to the systemic variables. Consistent with *Hypothesis 6*, *Sys. Energy/Pop.* and its square reveal a concave relationship between systemic development levels and the appeal of colonies. Development initially leads to systemic predation as states compete to capture resources and markets. These incentives reverse themselves, however, as the gains from production (A in the formal model) increase with development and the gains from trade (B) grow with the size of the world economy. Similarly, the appeal of colonization appears to ebb with increases in US productivity, though the strength of US opposition appears to be declining. As the chief proponent, and beneficiary, of free trade in the twentieth century, the US possessed few incentives to prop up the European colonial system when the US became hegemon. We add $\# States in System$ and $\# Major Powers$ to evaluate the effects of changing system structure and size. Having more major powers increases incentives for territorial empire.

²⁹A variable coded for the proportion of territories that are colonies ($\frac{colonies}{colonies+countries}$) yields equivalent results.

The number of states in the system is negatively associated with colonialism, though the two are rough complements. What is surprising, in fact, is that the relationship is not stronger. In any case, initial findings for the state-level hypotheses appear robust to systemic variables.

Table 2: Political Economy and the Number of Colonies (Neg. Binomial Regression)

D.V.: # of Colonies	— Strang (1990) —		— Ravlo, et al. (2003) —	
	7		8	
Indep. Variables	Coeff.	(S.E.)	Coeff.	(S.E.)
Energy Cons./Pop.	0.871**	(0.281)		
Energy Cons./Pop. ²	-0.094***	(0.029)		
Iron & Steel/Pop.			17.297***	(4.676)
Iron & Steel/Pop. ²			-29.698**	(10.034)
Military Technology	-26.300**	(9.395)	-24.975*	(11.272)
Dev. × Mil. Tech.	3.023†	(1.602)	45.906†	(25.591)
Regime Type	0.066	(0.051)	-0.114†	(0.063)
# Colonies Hegemon	0.027***	(0.007)	0.035***	(0.005)
CINC	7.712	(7.711)	26.749†	(15.890)
Major Power	1.614*	(0.780)	0.269	(0.986)
Intercept	-1.962*	(0.834)	-3.762***	(0.451)
/ln(α)	2.311**	(0.331)	1.273**	(0.311)
N	9671		10865	
Log-likelihood	-8159.553		-8959.683	
$\chi^2_{(8)}$	76.11		200.466	
Sig. levels : † : 10% * : 5% ** : 1% *** : 0.1%. Spline variables suppressed.				

Table 2 lists two negative binomial regressions, each estimating the number of colonies a country holds. Theoretical expectations for the count of colonies are looser than for the dichotomous variable. Still, results are substantially consistent with those in Table 1. Model 7 reports the curvilinear relationship between development and the count of colonies. *Military Technology* is again negative and significant, while the interaction term between development and military technology is again positive. The number of colonies held by the hegemon significantly increases colonialism by other states, while state capabilities or major power status have modest effects. Model 8 substitutes iron and steel production per capita for energy consumption. *Regime Type* becomes marginally significant in the expected direction for the first time. Five of the six hypotheses are thus consistently supported. The fact that democracy is usually insignificant suggests that, while institutionalist arguments are logically tenable, popular rule does not appear to impact imperialism in practice.

7 Conclusion: Once and Future Empire?

The lust for territory subsided among powerful nations as it became cheaper to make than to take, and as the global mercantilist system gave way to freer trade. Empire is unappealing when appropriative technology is low, domestic labor is scarce, or when global markets are obstructed.

In contrast, the desire to control land, rooted labor, and minerals remains strong in the developing world. Poor countries still covet territory, though they often lack the capacity to project power beyond their borders. In places where labor is cheap and abundant and capital is expensive, conquest and other activities designed to allow the state to acquire a larger pool of rents will remain appealing. A final factor is US enforcement of a norm of territorial integrity (Zacher 2001, Fazal 2004), though this could decay if the US weakens or developing states become more capable of conquest.

Paradoxically, successful development could increase the number of “middle tier” economies, which could then overwhelm internal or external inhibitions against territorial aggression. Rapid development could see nations cross the military technology threshold ($\hat{\rho}$) faster than the rise in the value of labor. At the same time, technological innovation might again increase the ability of the most advanced nations to take rather than make. Automation and smart weaponry could dramatically lower the cost of empire. Alternately, political instability or dramatic price increases in critical resources could spark efforts to control mineral-rich regions. Global political competition could also ignite efforts to capture and control scarce minerals. We must hope that rising powers see themselves as beneficiaries of the global economy and endorse open markets in due course.

Finally, what should be made of the revived empire debate? At least some of the controversy follows from different conceptions of what empire entails. Proponents of American Exceptionalism seem in fact to be advocating US leadership. To the degree that our results suggest an important role for the hegemon in promoting open markets, we can support this limited form of leadership. However, much of the advocacy is overblown and confused, precisely because sponsorship of global markets limits the incentives for powerful states to pursue other aspects of empire. Critics, too, seem to exaggerate the continuity between recent US policies and earlier incarnations of territorial empire. There is something different about how the current hegemon treats territory, but in contrast to George W. Bush, we see this change as applicable to every nation, not just the United States.

A The Size of Empire

The modeling appendix deals with increasing returns to scale. The size of empire is at issue; provided that it makes sense to engage in colonization at all, how much empire is a state likely to pursue? A standard way to model and think about increasing returns to scale is to include a fixed cost. Here the cost W is included whenever a positive level of colonization effort is chosen by N .

Equation (A.1) displays the utility function for some positive level of colonization ($L_N < 1$):

$$V_F = \alpha L_N^a K_N^b + \left[\frac{1}{2} + \theta(\rho_N F_N - \rho_S D_S) \right] K_S - W \quad (\text{A.1})$$

First-order conditions are identical to (5). With no colonization ($L_N = 1$), the utility is simply:

$$V_P = \alpha K_N^b \quad (\text{A.2})$$

The country N will only choose positive levels of colonization effort if $V_F - V_P > 0$. If the condition $V_F - V_P > 0$ initially holds, but does not hold for a larger α , this could explain the rapid decline of imperialism after World War II. The expression $V_F - V_P$ is re-written below:

$$\begin{aligned} (V_F - V_P) &= \alpha \left(\frac{\alpha a K_N^b}{\theta \rho_N K_S} \right)^{\frac{a}{1-a}} K_N^b + \frac{K_S}{2} + \theta \rho_N \left(1 - \left(\frac{\alpha a K_N^b}{\theta \rho_N K_S} \right)^{\frac{1}{1-a}} \right) K_S \\ &\quad - \theta \rho_S \left(1 - \frac{c(\frac{1}{2} + \theta(\rho_S - \rho_N))}{\theta \rho_S (c + d)} - \frac{c \rho_N}{\rho_S (c + d)} \left(\frac{\alpha a K_N^b}{\theta \rho_N K_S} \right)^{\frac{1}{1-a}} \right) K_S - W - \alpha K_N^b \end{aligned} \quad (\text{A.3})$$

The first derivative of $(V_F - V_P)$ with respect to α can be simplified as:

$$\frac{\partial(V_F - V_P)}{\partial \alpha} = \frac{1}{1-a} \alpha^{\frac{a}{1-a}} (a K_N^b)^{\frac{1}{1-a}} (\theta \rho_N K_S)^{\frac{-a}{1-a}} \left(\frac{1-a}{a} + \frac{c}{c+d} \right) - K_N^b \quad (\text{A.4})$$

A derivative of $\frac{\partial(V_F - V_P)}{\partial \alpha} < 0$ could explain rapid decolonization. The sign of the derivative is ambiguous, but becomes negative for small values of α , K_N , and c and for large values of θ , ρ_N , K_S and d . As some colonies were abandoned, administering remaining colonies was more expensive.

B Nationalist Insurgency

The potential association between nationalism and decolonization is consistent with two broad perspectives: First, it is conceivable that the fall of imperialism was triggered, in large part, by the economic incentives emphasized in our theory. According to this view nationalism only emerged when it became clear that colonies were economically unsustainable. The surge in nationalist ideology acted as a commitment device for new elites who wanted to make sure that they would be able to gain control of the country after independence. Hence, this first view argues that the causality runs from anticipated decolonization to the rise of nationalist movements and that nationalist insurgency was merely a by-product of inevitable decolonization which may at best have speeded up change. In contrast, the second view emphasizes causality in the other direction: According to this view, nationalist insurgency was one of the key factors precipitating decolonization in the first place. Both of these perspectives are compatible with our theory of economic incentives.

It is often argued that the rise of nationalism made it harder to police colonized populations and thus made holding colonies less attractive. We can discuss the effects of nationalism in the context of our baseline model and analyze how ideological insurgency interacts with the economic incentives for imperialism. Nationalist propaganda and ideological insurgency have two main effects in the model: 1) on the insurgent behavior in S , and 2) on the behavior of the working population in S .

Let us first discuss effect 1. Fighting the imperialists provides some additional motivation for the insurgents. Nationalism boosts the desire for victory of the independence warriors who fight harder and in a more disciplined way. As illustrated by the Cuban revolution led by Fidel Castro, a small group of highly motivated combatants can go a long way. This motivation boost from nationalism can be captured in the model by an increase in the effectiveness of the fighting technology ρ_S .

Nationalist feelings could also lead to non-military resistance and subversive activities among the working population (effect 2, above). Acts of sabotage and non-cooperation depress N 's fighting technology ρ_N . This can have a powerful negative impact on the military and administrative capacity of the imperialist, as exemplified by Gandhi's civil disobedience campaign in India.

How do these changes in fighting technology affect the time spent for labor and fighting by N and S ? The increase in ρ_S and decrease in ρ_N have an ambiguous effect on the optimal labor time

L_S^* , as $\partial L_S^*/\partial \rho_S < 0$ and $\partial L_S^*/\partial \rho_N < 0$. In contrast, the effect of nationalism on the labor and fighting incentives of N are clearer. As discussed earlier, $\partial L_N^*/\partial \rho_N < 0$. A less effective imperialist army thus results in a greater optimal labor time of N (i.e. larger L_N^*), and in less time spent on fighting (i.e. lower F_N^*). If this effect is large enough it is possible that ρ_N falls back below the technology threshold needed for imperialism (which we discussed at the beginning of Section 4.1). Hence, the surge in nationalist ideology in S could have weakened N 's army to such an extent that it became worthwhile to liquidate the empire. Together with increasing returns to scale (Appendix A) and democratization (Section 4.2), the rise in nationalist ideology could thus account for the rapid collapse of imperialism and swift decolonization displayed in Figure 1.

What remains unresolved is the relative weights that should be assigned to each respective element. Our view is that nationalism hastened the demise of empires, but that nationalism by itself did not cause decolonization. Nationalism has been accused of precipitating World War I and certainly by the 1930s had circled the globe. Still, the end of the great age of empire did not come for another generation. Around the world even today there are occupations in the face of substantial nationalist resistance. In Chechnya, Iraq, and Palestine, nationalism creates a more cohesive, and vigorous resistance, but states that deem the cause sufficient persist, and sometimes prevail. Nationalist sentiments and the war-fighting technology of insurgency are factors making territorial occupation more difficult. They do not directly influence the interest a nation may or may not have to occupy some territory, somewhere. We view the critical change to be the lack of desire among potential imperial powers to conquer and control territory, at least for extractive purposes. Future research may explore the relative importance of metropol and target variables. For now, the theory we offer subsumes both sets of factors, while contributing a new emphasis on economic and systemic variables associated with the conqueror, rather than the conquered.

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