

Appendix 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.

Appendix 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.