Binding Prometheus: How the 19th Century Expansion of Trade Impeded Britain’s Ability to Raise an Army

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This article explores how the dramatic expansion of British trade in the decades prior to World War I affected Britain’s ability to raise an army. We first develop a simple institutionally based model of British army recruiting which we then perturb by expanding trade while holding all other variables constant. Our theoretical analysis suggests that the expansion of trade would impede Britain’s ability to raise an army, a prediction that finds substantial support in the historical record using both quantitative and qualitative analysis. Contrary to the conventional wisdom that trade enhances a state’s military power, we find that the expansion of trade did not ease Britain’s resource constraints by making labor more freely available for military purposes. Rather, by raising the civilian demand for labor, the expansion of trade made labor more expensive and difficult to mobilize, even as a more effective army became more important to British strategy.

Scholars now recognize that the deep division in international relations between international political economy and international security was an artifact of the Cold War (Mastanduno, 1998; Kirshner, 1998). Since the mid-1990s a growing number of studies have explored how international economic forces shape the security politics of states (e.g., Mansfield, 1994; Liberman, 1996; Copeland, 1996; Papayoanou, 1999; Lobell, 2001). Despite this resurgence in scholarly interest, the theoretical linkages between economics and security remain underdeveloped. For example, most of the literature subscribes to the deeply held conventional wisdom that international trade necessarily enhances the potential military power of all states that transact on world markets. Because trade raises national incomes, trade is believed to increase state power by enhancing the state’s ability to divert economic resources into its military establishment (e.g., Hirschman, 1945; Viner, 1948; Knorr, 1970, 1975; Grieco, 1990; Gowa and Mansfield, 1993).

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This idea, which Albert Hirschman terms the “supply effect” of trade, provides the theoretical foundations for several important areas of research in international relations. Yet it has escaped scholarly scrutiny largely because it seems so intuitively obvious as to be self-evident. As Hirschman writes, “All these points are obvious and hardly need further elaboration” (1945:14).

A recent article by David Rowe (1999) challenges this conventional wisdom. Building on the insights of the Heckscher-Ohlin model of international trade, Rowe argues that the effects of international economic forces on a state’s military power vary. Whether international economic forces, such as an expansion or contraction of international trade, enhance or impede a state’s ability to mobilize those resources most critical to its military power is inversely related to how these economic forces alter domestic relative prices. They will enhance the state’s ability to mobilize resources into the military whenever they cause the relative prices of these resources to fall; conversely, they will impede the state’s ability to mobilize these resources whenever they cause their relative prices to rise. Thus, by raising wages throughout labor-abundant Europe, Rowe argues that the 19th century expansion of the world economy progressively impeded the ability of the European great powers to mobilize labor into their militaries. And, because prewar military technology meant that labor was the single most important resource for a state’s military power, the expansion of the world economy progressively eroded these states’ military power as well.

Rowe’s study, however, fails to adequately link the growing difficulties that the European great powers experienced in mobilizing labor to the expansion of the world economy. For example, Rowe offers Britain’s chronic recruitment difficulties and a dramatic decline in the quality of British recruits as evidence for his argument, but does not explain why the expansion of trade would lead to these outcomes. The problem is that pressures emanating from the international economy are rarely the direct and unmediated cause of social outcomes. These pressures are almost always aggregated by and filtered through the economic, social, and political institutions that link state and society to produce domestic outcomes (Bates, 1997; Garrett and Lange, 1995; Gourevitch, 1986). Because different institutions will aggregate these pressures in different ways, the same economic shock will generate different outcomes under different institutional settings (Garrett and Lange, 1995:75; Thelen and Steinmo, 1992). To explain how an economic shock produces a specific outcome, one must show how the country’s domestic institutions aggregate and transform the economic shock in ways that produce the specific outcome that one observes.

In this article we explore and extend Rowe’s challenge to the conventional wisdom by analyzing how the 19th century expansion of trade affected Britain’s ability to raise an army. The article has six sections. The first section reviews the growing importance of the army in prewar British strategy in order to provide the historical context for our study. In the second and third sections we analyze the institutions Britain used to mobilize labor into the army in order to construct a model of British army recruiting, which we then use to derive a number of hypotheses about the specific ways in which the expansion of trade affected Britain’s ability to raise an army. The fourth section explores these hypotheses empirically, using both the qualitative historical record and quantitative empirical analysis. In the fifth section, we discuss the implications of our findings for Britain’s army, politics, and strategy. We show that the expansion of trade progressively impeded Britain’s ability to raise an army even as the need to prepare for major land war became more important to British strategy. We conclude by discussing the broader implications of our study. Contrary to conventional wisdom, the expansion of British trade did not ease the labor constraints that confronted the British army; rather the expansion of trade made these constraints even more binding.
The Growing Importance of the British Army in British Strategy

Three principles governed British strategy in the decades before World War I: preserving the status quo, maintaining the balance of power in Europe, and retaining a “free hand” for British foreign policy which minimized its alliance commitments (Gooch, 1994). Despite Britain’s traditional reliance on sea power, the army’s importance to British strategy grew dramatically in this period. First, foreign naval construction and the growing financial burden of British naval power undermined Britain’s naval dominance. This development prompted Britain to engage in a series of naval arms races, redeploy the navy from the western Atlantic, Pacific, and Mediterranean to the island’s home waters, and establish naval understandings with France and Japan (Kennedy, 1976, 1980; Friedberg, 1988; Lobell, 2001). It also substantially raised doubts about the navy’s ability to defend the home islands and the army’s ability to repel an invasion. These doubts prompted three important inquiries in the Committee of Imperial Defence in 1903, 1908, and 1913–14. Although these reviews affirmed the primary role of the navy in protecting Britain, they also underscored the poor state of Britain’s land defenses (Gooch, 1994:287–288; French, 1982).

Second, the army’s importance to British strategy grew because protecting the British empire created a growing need for British land power. The penetration of central Asia by Russian railways meant that Russia’s massive army could be moved by rail to within close range of the Afghan border, raising the possibility of a major war on the frontiers of India that would need to be fought and won by the army (Friedberg, 1988:214–218). The Boer War (1899–1902) demonstrated that Britain’s existing military resources were scarcely adequate to pursue even a minor imperial conflict. The war required Britain to field more than 400,000 troops to subdue an irregular force that never numbered more than 90,000. In early 1900, only 17,000 regular army troops remained in Britain, raising alarm about the country’s vulnerability to an attack (Gooch, 1994:287; Adams and Poirier, 1987:7; J. Stevenson, 1990:202). Moreover, the army’s performance was abysmal, raising serious doubts about the adequacy of the army’s recruiting, training, and tactics and rendering all sites of potential military conflict scenes of potential disaster (Friedberg, 1988:233–234).

Third, and most important, the army’s role in British strategy grew because British naval power could no longer maintain the European balance of power, one of Britain’s guiding strategic principles. The falling cost and growing density of land-borne transport on the European continent not only made the continental powers less vulnerable to naval blockades; it also meant that they could rapidly redeploy their troops to counter a landing of British forces on the periphery of Europe, thus nullifying Britain’s traditional strategy for continental intervention (Friedberg, 1988:212–214).

This was especially true after the early 1900s, when Germany displaced France and Russia as the primary threat to the continental balance. Germany’s position in the center of Europe and its conscripted mass army made Germany relatively invulnerable to British naval pressure. Even a victory in the Anglo–German naval arms race would not resolve the problem of how to maintain the European balance of power, because Germany would still possess a free hand to wage war on the Continent. A strategic review of British security policy by the Committee of Imperial Defence in 1911 concluded that Germany would defeat France long before a British trade embargo damaged Germany’s war-making capabilities and that British amphibious landings on the German coast would not affect the war in France (Gooch, 1994:291–292).

By 1911, the advocates of British land power gained the upper hand in Britain’s internal strategic debates. Military intervention on the Continent offered the best hope for maintaining the balance of power and most closely matched
the wishes of Britain’s leading politicians (Gooch, 1994:296). Thus, “the naval predominance that had characterized British strategy in the nineteenth century had given way to military preeminence,” resulting in a significant shift in the center of gravity in British strategy from the navy to the army (Gooch, 1994:281; also S. Williamson, 1969).

The changing strategic environment, however, was only one factor that affected the British regular army and its role in British strategy. In addition to the principles that defined the ends of British strategy were the resource constraints that determined the means available to pursue them. Britain did not conjure its military resources from thin air. It mobilized them from the national economy through a political process in which it induced its citizens to surrender their privately held resources to the state for public purposes (Rowe, 1999; Levi, 1997; Barnett, 1990).

Two important implications followed from this fact. First, because citizens could not use the resources taken by the state for their own private desires, there were inherent domestic political limits on Britain’s ability to extract resources from the national economy. The problems of taxation and finance placed significant constraints on British policy, forcing Britain to continually “balance the demands of defense against the requirement for economy” (Gooch, 1994:288). Second, these limits were determined, in part, by the opportunity costs that the British state’s taking of these resources imposed on the citizens who supplied them. The more citizens valued using their resources in alternative ways, the less willing, ceteris paribus, they were to surrender these resources to the state. Thus, economic changes that affected the opportunities and incomes that Britain’s citizens earned from the private use of their resources also affected the state’s ability to mobilize these resources for its strategic purposes.

In other words, British strategy in the late 19th and early 20th centuries operated within an environment defined not only by the shifting balance of power, but by the rapid economic changes of this era as well. An important change was Britain’s deepening economic integration into a broader world economy, marked most clearly by the dramatic and sustained expansion of British trade in the decades before the war. Between 1860 and 1913 British trade grew by 273 percent and was a major source of Britain’s rising economic prosperity in the 19th and early 20th centuries (Mitchell, 1962:283–284, 1975:492–497; Maddison, 1991:74–76). The volume of British merchandise exports from 1870 to 1913 grew by a compound rate of 2.8 percent per year, while real GDP growth averaged a compound 1.9 percent per year (Maddison, 1991:51, 75). International economic competition was a major source of Britain’s productivity gains during this period. Growing economic competition from imports not only made Britain’s agricultural productivity higher than in European countries that protected their agricultural sectors; it also meant that Britain’s economic structure was more efficient because it was concentrated in sectors where Britain possessed its comparative advantage (Maddison, 1991:39).

**Trade, Domestic Institutions, and British Army Recruiting**

Profound changes in the international economy, such as the 19th century’s dramatic expansion of world trade, rarely operate directly on governments or their militaries. They are instead aggregated by and channeled through the various institutions that organize a country’s economic, social, and political life.

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1 The _ceteris paribus_ clause is crucial. We do not claim that the changing opportunity cost of surrendering privately held resources to the state is the _only_ factor that determines the willingness of private individuals to surrender resources to the state, or, by extension, the state’s difficulty in mobilizing resources from the national economy. Other factors, especially the perceived level of external threat, can also affect this calculus.
These institutions, essentially the formal and informal rules that structure behavior (North, 1990), determine how international economic shocks alter individual preferences, the range responses open to individuals to act on their altered preferences, how these responses are aggregated by and articulated through the policy process, and, finally, how the government reacts to the resulting political-economic pressures (Garrett and Lange, 1995; Bates, 1997; Gourevitch, 1986). Because different institutions will aggregate the same economic shock in different ways, to accurately assess the effects of an economic shock, one must also accurately model how a country’s institutions transform the shock into specific outcomes. Unfortunately, there is no “grand theory” of institutions that lends itself to simple, parsimonious theorizing. Most important arenas of social behavior are governed by multiple, overlapping institutions that can interact in complex ways. Rather than focus on single variables such as a country’s party system or the nature of its electoral politics, institutional analysis requires instead careful attention both to the array of institutions that structure behavior in specific settings and to the specific ways in which these institutions interact to shape the outcomes one observes (Garrett and Lange, 1995:75).2

To understand how the 19th century expansion of the world economy affected Britain’s ability to raise an army involves at least three separate analytical issues. (See Figure 1.) The first issue (I) is how the expansion of trade altered wages within the British economy, which, in turn, altered the opportunities and rewards that accrued to British citizens from using their labor in different ways as well as the pattern of individual and societal preferences over political and economic behavior. The second issue (II) is how the institutions used by the British government to mobilize labor into the army shaped individual and societal responses to military service under the changed economic circumstances, and, in so doing, transformed the economic shock into economic and political pressures on the government’s ability to mobilize these resources for strategic purposes. The third issue (III) is how Britain’s government and military institutions shaped these actors’ perceptions of these pressures and determined the range of responses

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2 Although institutions play a critical role in determining outcomes, it is important to remember that they do so by constraining and refracting social behavior that originates from more fundamental causes. Institutions affect social outcomes by structuring social interaction; they do not motivate the behavior that drives these interactions. See Thelen and Steinmo (1992).
open to them. The British state was not a unitary actor but allocated authority over different aspects of British military policy among various entities. This structure determined which actors within the government and military experienced the changing constraints and in what manner, how these changing constraints became incorporated into the policy process, who had authority to implement what types of policy responses, and, ultimately, the potential range of responses that the state had available to meet them. We consider these issues in turn.

(I) The Effect of Expanding Trade on British Wages

To determine how the expansion of trade affected British wages, we turn to the Heckscher-Ohlin model of international trade. This model is especially appropriate as recent work in economic history has broadly confirmed its applicability to analyzing the rapid integration of the world economy in the late 19th and early 20th centuries (see O’Rourke and Williamson, 1994; O’Rourke, Taylor, and Williamson, 1996; J. Williamson, 1996). In the Heckscher-Ohlin framework, a country’s trade broadly reflects its underlying factor endowment. A country exports those goods that use intensively those factors of production in which its economy is abundantly endowed relative to the rest of the world, and imports those goods that use intensively those factors in which its economy is scarce. An expansion or contraction of trade changes domestic relative factor prices by changing the prices of the country’s traded goods. For example, a rise in world demand for a country’s exports causes export prices to rise and leads to a more than proportional increase in the returns to the factors used intensively to produce these goods; conversely, increasing import penetration in a country’s import-competing markets causes prices of these goods to fall, leading to a more than proportional decline in the returns to the factors used intensively to produce them.

We consider the expansion of trade using a three-factor model of labor, land, and capital in which Britain is abundant in labor and capital, but scarce in land. Our approach diverges from most analyses of British hegemony by international relations scholars, who use implicit two-factor (2 × 2) models of capital and labor to assume that hegemonic Britain was abundant in capital, and, by definition, scarce in labor. We believe that two-factor models of labor and capital are too crude to accurately analyze the impact of world trade in the late 19th and early 20th centuries. As the economic historians Kevin O’Rourke and Jeffrey Williamson (1999:250) write of this era:

Land-scarce and labor-abundant Europe exported manufactured goods to the resource-abundant, labor-scarce New World, in exchange for grain, wool, raw cotton, and other agricultural products. It is difficult to rationalize such trade in the context of simple 2 × 2 models since land, labor, and capital were all relevant factors of production underlying trade in the Atlantic economy a century ago.

Moreover, the empirical evidence strongly suggests that Britain was abundant in labor relative to world markets during this era. Britain had one of the highest population densities in the world (Rogowski, 1989:26–27). Britain was also a major source of emigration to the capital- and labor-scarce New World in the late 19th and early 20th centuries. At its peak in the 1880s, Britain’s ten-year emigration rate was the third highest in Europe; by 1910 its rate had fallen to only fourth, a phenomenon that is very difficult to reconcile with the idea that Britain was somehow “scarce” in labor relative to world markets at this time (O’Rourke and Williamson, 1999:122). Most important, according to the Heckscher-Ohlin framework, the factor content of a country’s trade will reflect its underlying
factor endowment, so that Britain’s labor abundance should be reflected in the factor content of its exports. In an influential paper, the economic historians Nick Crafts and Mark Thomas found exactly that. Britain’s comparative advantage in this period lay in unskilled-labor-intensive, capital-neutral, and human-capital-scarce manufactures, and net British exports were unskilled labor intensive throughout the period from 1870 to 1935 (Crafts and Thomas, 1986).

Given Britain’s abundance in labor, the Heckscher-Ohlin model predicts that an expansion of international trade would cause relative wages to rise in Britain (and other labor-abundant economies) but fall in labor-scarce economies elsewhere. In fact, British wage:rental ratios rose throughout the period, as did wage:rental ratios in other labor-abundant European economies, while wage:rental ratios fell in the labor-scarce economies of the New World in 1914 (O’Rourke and Williamson, 1999:62–63). Between 1870 and 1910 the ratio of wages to land rents in labor-abundant but land-scarce Europe rose by a factor of 2.7 in Britain, 1.8 in France, and 1.4 in Germany. And, consistent with the Heckscher-Ohlin model, the wage:rental ratio fell in the land-abundant and labor-scarce economies of the New World. Between 1870 and 1913 the Australian ratio had fallen more than 25 percent, while the United States’ ratio fell by more than half. Likewise, the Argentine ratio in 1913 was only one-fifth its level in the mid-1880s (J. Williamson, 1996:13). These relative price movements were also reflected in British unskilled real wages, which rose 59 percent between 1870 and 1913 (J. Williamson, 1995:Table A2.1).

These price shocks would have affected any enterprise, such as the British army, that employed large amounts of labor. The more the expansion of trade drove up civilian wages, the greater became the opportunity costs of military service for the rank-and-file soldier. Yet these price shocks do not, by themselves, determine how potential British recruits responded to the growing opportunity costs of military service or how these responses were perceived and acted upon by the British state. To answer these questions requires an understanding of the various institutions used by Britain to mobilize labor into the military.

(II) The Institutions of Labor Mobilization—Voluntary Enlistment; Selective Recruitment; Static Military Wages

Three institutions are important to understanding how Britain mobilized labor into its military. The first and most important institution was voluntary enlistment. Unlike the continental great powers which practiced conscription, Britain used a system of voluntary military enlistment in which young men voluntarily signed up for several years of military service, an institution that forced the state to compete in the open market against other employers for British labor. Thus, rather than command labor from the economy, Britain had to induce its young men to perform military service by making the army at least as attractive as other employment opportunities.

The second important institution was selective recruitment. Military service was physically and psychologically demanding. Muscle power was the primary method of battlefield mobility. Soldiers were often required to carry substantial loads at rapid paces over long distances and to operate in the field under challenging conditions with little access to adequate medical facilities. Disease could devastate an army as thoroughly as a crushing defeat. These factors made the strength and overall health of recruits an important component of the army’s military capabilities. Army recruiters did not induct all young men willing to serve, but selected only those recruits that met the army’s medical standards. Thus, the potential recruit’s first task was to undergo a medical evaluation; only those that passed this test were inducted.
The third important institution was static military wages. Army wages during most of this period remained essentially unchanged even though civilian wages increased steadily throughout the period. The basic money wage of a British private rose only seven times between 1860 and 1914, but even these pay raises proved to be substantively insignificant when compared with the general rise in civilian wages (Skelly, 1977:191; War Office, 1906–1907c:205). One important cause of static military wages was the recruitment contract. Soldiers were legally obligated to serve for several years and could not leave the army to seek out higher wages in the civilian economy. Nor could soldiers legally strike for higher army wages. According to the Wantage Committee, which was formed in the early 1890s to solve Britain’s deepening recruitment problems, “Soldiers are precluded by the conditions of service and the rules of discipline from exercising the ordinary pressure which in civil life is brought to bear upon employers of labour by their employés. Improvements in pay or position and other reforms in the Army must therefore have their origin not from below, but direct from the authorities” (Wantage Committee, 1892). The recruitment contract thus insulated the army from the full brunt of rising civilian wages and narrowed the market in which it competed directly with civilian employers to the yearly market for recruits. However, the most important causes of static military wages, which we discuss directly below, were the high political costs of any effort to expand military wages and increase military budgets. These costs imposed an unwritten rule on the army that, in the absence of some compelling new threat, it could compete for labor only in ways that did not raise its budget.

(III) Britain’s Government and Military Institutions—Parliament and War Office

Two institutions determined military policy in Britain, each with different powers and responsive to different constituencies. The first was the popularly elected British Parliament which formed the government and set the general parameters of military policy. At the broadest level, Parliament determined the level of taxation in the economy and allocated the state’s revenues among competing uses, including the military. More directly, it determined the overall size and structure of the British army, its budget, rates of military pay, terms of military service, and the general institution (voluntary enlistment) by which the army mobilized labor from the economy. Because Parliament was popularly elected, electoral competition for control of Parliament forced it to be responsive to the inherent popular resistance to the state’s efforts to mobilize private resources for military purposes.

Most aspects of army operations, however, were delegated by Parliament to the War Office. At the broadest level, the War Office reconciled the ends of British strategy with the means that Parliament made available to meet them. It thus formulated the army’s military doctrine and developed its war plans. At a more basic level, the War Office ran the army’s day-to-day affairs and maintained its viability as a fighting organization. Among other tasks, it oversaw the recruitment of soldiers out of the economy, set the medical standards for enlistment, determined the training of recruits, ensured that soldiers were armed and fed, and deployed units in the field.

This division of authority meant that no single entity exercised full authority over all aspects of the army’s organization and operations, a structure that deprived Britain of considerable flexibility in responding to the country’s changing strategic and economic environment. Although the War Office was tasked with

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3 Some readers may object that static wages are not properly an “institution.” Yet given the extreme difficulties in raising military wages that confronted the British Army, which we discuss below, we believe it appropriate to model the army as operating under an informal rule that it could not compete for labor in ways that led to rising military wages and military budgets.
ensuring that the army could protect Britain’s strategic interests, any significant change in the army’s structure, size, or budget required parliamentary approval. Gaining approval was nearly impossible. The Secretary of State for War was often the only member of the Cabinet dealing with army matters and had few natural allies in the political competition in Parliament over scarce budgetary resources (Skelley, 1977:242). Most important, higher military budgets were a clear political liability in the electoral competition over the control of Parliament and had forced the resignations of Randolph Churchill as chancellor in 1886 and Gladstone as prime minister in 1894. Rising military expenditures became “one of the central political problems of the period” and Parliament was loath to approve them, preferring instead to yield to the latent popular resistance against military spending (Ferguson, 1998:111; Gooch, 1994). Substantial changes in the army’s size, structure, or finances were politically feasible only when linked to compelling national emergencies such as the Boer War or, as in the Haldane reforms, implemented in ways that reduced military expenditure (Poe, 1967:135).

This problem was especially pronounced with regard to military wages. Although maintaining competitive military wages was potentially the single most effective instrument for attracting labor into the army, higher military wages were also a significant liability for a Parliament preoccupied with controlling military expenditure. Army pay was the single largest line item in the army budget, averaging one-third of the army budget in the decade before the war. Other personnel costs such as food and clothing drove expenses even higher (War Office, 1913–1914). Moreover, pay was a recurring expenditure. Unlike monies spent on weapons, which represented one-time outlays for weapons systems that had a useful life of a decade or more, increases in military pay entailed permanent annual increases in military spending. In short, holding the line on military spending meant holding the line on military pay.

The Effect of Trade on Army Recruitment

How did the expansion of trade affect Britain’s ability to raise an army? We can now answer this question using our knowledge from the previous section and the method of comparative statics. Comparative statics is a form of thought experiment that isolates the effects of a change in a single variable by comparing the outcomes generated by a change in that variable over two time periods while holding every other variable constant. To understand how an expansion of trade affected Britain’s ability to mobilize labor, we first construct a causal model of how Britain mobilized labor from the economy using our knowledge of the actual institutions Britain used for this purpose (II and III from the previous section). We then perturb this model by varying a single parameter—we expand trade—and ask how this shock (I from the previous section) changes the outcomes the model produces. Because only trade varies, any changes in these outcomes indicate the causal impact of an expansion of trade on Britain’s ability to mobilize labor into the army.

Figure 2 represents our causal model of British army recruiting. The demand for recruits is given by the curve $D$. This curve is set by Parliament, which, because it determines both the size of the British army and the terms of military service for recruits, also determines the number of recruits that must be mobilized from the economy each year to maintain force levels. In addition, because Parliament sets the size of the army in response to the external threats to Britain’s strategic interests, we further expect the demand for army recruits to be relatively inelastic with respect to wages. This point was forcefully made by Field

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1 Nor did military technology enable Britain to substitute weapons for men as the basic unit of military power. See D. Stevenson (1996:62); Herrmann (1996:229).
Marshal Viscount Garnet Wolseley in 1896, who wrote to the Permanent Under Secretary of State for War (Sir Arthur Haliburton) that

> the strength of our Army must be fixed by the work it has to do and not by the rates of the recruiting market. The latter we can command, the former is imposed upon us. The imperious pressure of Imperial needs will not yield to consideration of home thrift, and an enemy will not weaken his attack . . . because rather than increase the soldier’s pay, we give it too weak a garrison. (War Office, 1896c)

In other words, Britain could not offset the cost of higher wages by cutting back on the number of soldiers; increases in military wages translated directly into increases in the army’s wage bill.

The supply of potential recruits was determined by the institution of voluntary enlistment, or, in other words, by the number of young men willing to voluntarily enlist for military service at the prevailing rate of pay. The institution of selective recruitment, however, meant that the army did not induct all potential soldiers willing to serve at a given wage, but rather selected among the total pool according to some standard. Thus, the market for recruits was characterized by two supply curves S_t and S_1. S_t represents the total pool of labor available for military service at different wage levels. S_1 represents the supply of recruits meeting the army’s selective standards, which at every point lies inside the curve S_t.

The level of military wages, W, is initially determined by the intersection of S_1, the supply curve of recruits meeting the prevailing quality standard, and D, the state’s demand for military labor. Once Parliament sets the initial wage level, however, we treat W as fixed in order to capture the institution of static military wages that characterized the market for recruits during this period.

At W, out of the total available pool of OT potential recruits, the state inducts OI recruits into the army, and rejects IT as unfit for military service.

Figure 3 represents the effects of an expansion of international trade on British recruiting. Britain’s abundance in labor relative to the rest of the world...
means that rising levels of trade increase the demand for labor in the British economy, causing civilian wages to rise. This, in turn, shifts upward (see Figure 3) the supply curve of the total pool of labor potentially available for military service, $S_t$, which rises to $S_t'$, as well as the supply curve of labor meeting the prevailing quality standards for military service, $S_1$, which rises to $S_1'$. Because Britain practices voluntary enlistment, fewer men now offer themselves for military service, causing the number of recruits inducted into the military to fall from $O_1$ to $O_1'$.

This shortage presents the War Office with a substantial problem. The institutional division of authority between War Office and Parliament prohibits it from responding to this shortage by raising wages to attract more recruits. Moreover, Parliament’s hostility to rising military expenditures means that War Office efforts to lobby for an increase in pay will be politically costly and unlikely to succeed, especially because there is no change in the level of external threat with which the Parliament can justify larger military budgets to the electorate. This impasse forces the army to seek out some mechanism other than competitive wages to fill the ranks. The army’s most viable alternative is to exploit the institution of selective enlistment in order to expand the supply of recruits at the prevailing wage.\textsuperscript{5} It can use its authority over physical standards to set a new, less restrictive standard, so that the number of recruits willing to serve at the fixed wage $W$ equals the demand for recruits established by Parliament $D$. This standard is represented in Figure 3 by the (dashed) supply curve $S_2$. It lies at every point between the old standard $S_1'$ and the total pool of military labor $S_t'$ and intersects the demand curve $D$ at $W$, yielding $O_1$ recruits. In other words, because the War Office cannot respond to changing market conditions by changing wages, it responds instead by altering the quality of recruits inducted into the army.

\textsuperscript{5} One can imagine other ways to increase enlistment such as appeals to patriotism, exaggerations of the level of external threat, or the deliberate manipulation of foreign crises. None of these strategies, which seek to convince men who would otherwise not enlist to enter military service, will be as immediately effective as relaxing the army’s selective standards. Rather than target potential recruits who would otherwise not enlist, relaxing standards taps instead that pool of men willing to join the army but barred from doing so by the army’s restrictive standards.
We can now derive at least three hypotheses concerning the effect of the expansion of trade on the British army. Our first hypothesis follows directly from our discussion above:

**H1:** The expansion of trade will force the army command to lower quality standards for military recruits.

Second, we define the rejection rate as the proportion of the total pool of potential military recruits who are rejected for military service because they fall below the prevailing quality standards. Graphically, the rejection rate is

\[ \frac{OT - OI}{OT} \]

in the first period, and

\[ \frac{OT' - OI}{OT'} \]

in the second. Because \( OT > OT' \), it also follows that

\[ \frac{OT - OI}{OT} > \frac{OT' - OI}{OT'} \].

In other words, higher wages in the civilian sector cause fewer men to step forward for military service, which, in turn, leads the military to lower standards and reach deeper into the available pool by rejecting fewer men in order to maintain sufficient numbers. This yields our second hypothesis.

**H2:** The expansion of trade will cause the rejection rate for recruits to fall.

Finally, because rising demand for labor in the civilian sectors of the economy creates a shortage of army recruits meeting the initial quality standard (\( OI' < OI \)), rising levels of trade will cause an influx of less qualified recruits (\( OI - OI' \)) as the army seeks to maintain numbers. This produces our third hypotheses:

**H3:** The expansion of trade will erode the quality composition of British army recruits, and, by extension, the British army.

We now explore these hypotheses.

**Empirical Analysis**

**Lowered Standards**

Throughout the first half of the 19th century, army wages were low but competitive with unskilled wages, especially once one factors in the regularity of army pay (Spiers, 1980:53). By mid-century, however, military wages compared favorably with only the lowest paid agricultural labor. In 1867, for example, the War Office estimated that the total value of pay and in-kind services for an infantry private was 34£ 4s per annum, while annual wages for the lowest paid agricultural workers amounted to 33£ 14s in Scotland, 30£ in England, and 18£ 19s in Ireland. By contrast, the War Office estimated that annual wages for unskilled workers in the cities varied between 39£ 3s and 49£ (Skelley, 1977:193). Moreover, the army’s tendency to compare its wages with the lowest paid agricultural
workers understated the emerging gap between army and civilian pay. According to the report of the Wantage Committee (1892:13):

It is a delusion to compare the position of the soldier with that of the ordinary agricultural labourer, within whose ranks are comprised old and weakly men, and men tied by various circumstances to their native villages and shut out from free competition. The comparison should be made between the soldier and the young man of good physique, who is free to offer his services wherever wages are most remunerative. . . . The pay within the reach of such able-bodied, though unskilled, men is undoubtedly in excess of that offered by the State to the Army recruit.

The continued general rise in civilian wages soon meant that military pay was uncompetitive even when compared to agricultural wages. By 1900, regularly employed but lower paid agricultural workers in Scotland and England received from 16s to 22s per week, a sum higher than the military wage (Skelley, 1977:223–224, n. 92). In 1904, the Royal College of Physicians testified to an official inquiry that the sharp decline in agricultural recruits was due to the fact that “there has been a marked increase in the wage of agricultural labourers (a diminishing class) of late years, and that the attractions offered to this class by the Army in the shape of pay are proportionately much less than formerly.” In fact, the general rise in wages sharply limited the number of desirable recruits from all occupational backgrounds. The Royal College further testified that the “increase in the rate of wages of all forms of labour . . . diminishes the attractions of a military career for those engaged in regular labour, and leads to a proportionately larger number of the ‘unemployed’ offering themselves for service in the Army” (Interdepartmental Committee on Physical Deterioration, 1904:98). The Metropolitan Police concurred, concluding that “the calling of a soldier has ceased to attract the class of men who formerly enlisted, and as a consequence a larger proportion of the residuum of the population come under the notice of the army Recruiting Authorities” (Interdepartmental Committee on Physical Deterioration, 1904:6).

The growing gap between civilian and military wages caused chronic shortages of recruits between 1860 and the First World War. Only occasionally did British troops reach establishment strength, or did the number of recruits inducted into the army equal the troops lost to discharge, desertion, or other causes (Spiers, 1980:37–39; Skelley, 1977:235–237). Moreover, it was clear to army recruiters that their ability to raise troops was closely linked to the rising demand for, and wages of, labor in the civilian economy. According to the Wantage Committee (1892:13), the most important reason for the army’s recruitment problems was that “the present pay of our soldiers is inadequate, and that an improvement in both their pay and position is essential.” The annual reports of the Inspector General of Recruiting regularly blamed poor recruiting years on the flourishing state of British economy (e.g., Inspector General of Recruiting, 1889:3, 1897:7, 1900:3, 1914:7). Likewise, a 1904 parliamentary inquiry into the declining quality of British recruits noted that “the class from which the recruits are derived varies from time to time with the conditions of the labour market. When trade is good and employment plentiful it is only from the lowest stratum of the people that the Army receives its supply of men: when, on the other hand, trade is bad, a better class of recruit is available” (Inter-Departmental Committee on Physical Deterioration, 1904).®

These pressures intensified dramatically in the years just before World War I when the army confronted severe and growing shortages of recruits (Inspector General of Recruiting, 1907–1911). The most effective means to solve the army’s

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® References to “trade” in this era encompass both foreign trade and domestic economic activity.
difficulties, as the Wantage Committee noted, should have been to make military pay competitive with civilian wages. The committee’s two most important recommendations were to “raise the pay of the soldier to the ordinary market rate for unskilled adult labour, i.e., compete openly in the labour market for the class of man required” and to “make the conditions of service such as will attract the desired stamp of man into it and keep him contented while serving” (Wantage Committee, 1892:11). Yet the political difficulties associated with raising military wages meant that Parliament raised the basic pay of the British private only seven times in over fifty years (Skelley, 1977:191; War Office, 1906–1907c:205). Not only were these increases substantively insignificant relative to the rise in civilian wages, the continual rise in civilian wages meant that the beneficial effects of any single increase were temporary. As Arthur Haliburton, Under Secretary of State for War, complained:

The pay of the soldier has frequently been increased, with a view of inducing an older class of men to enlist, and each such measure has failed. . . . Several additions and alterations [to pay] have since been made, and to such an extent that since 1866 the net cash received by the soldier has been nearly trebled, and yet we are told that the recruit of today is far worse than the recruit obtained before all these increases were given. (War Office, 1892c)

Likewise, a 1902 pay increase prompted by the army’s dismal performance in the Boer War and a deepening recruitment crisis proved equally ineffective. The increase did not raise the entry-level wage for recruits but applied only to soldiers with at least six months’ military service who were at least 19 years of age (War Office, 1906–1907c:205). Even then the soldier’s wage remained paltry by civilian standards, more than 2s lower than the average weekly wage of the poorest paid agricultural laborers in Britain. Not surprisingly, the wage increase failed to yield any improvement in the quantity or quality of recruits (Spiers, 1980:55; Skelley, 1977:190). “This all tends to show,” the 1903 annual report of the Inspector General of Recruiting dryly noted, “that under present conditions, even with the prospective advantages obtained by the soldier . . . there is still a want of elasticity in the recruiting market” (Inspector General of Recruiting, 1903:25). Nor did two further pay raises pushed through by the successive Secretaries of State for War, Arnold-Forster and Haldane, yield lasting improvements in army recruitment.

Unable to attract labor from the economy with competitive wages, the army sought instead to manipulate the supply of potential recruits by varying the physical requirements. Army recruiters would lower standards whenever potential soldiers were in short supply, thus expanding the pool of potential recruits, and raise standards whenever recruits were abundant (Spiers, 1980:40; Skelley, 1977:237–38). Often the physical requirements for recruits would change several times within a year. Sometimes this involved setting new permanent standards for recruits; at other times it simply meant loosely interpreting existing ones. Changing standards was a more flexible instrument than changing wages. Not only did this course of action entail none of the political costs inherent in seeking to change army pay, it could be targeted at only incoming recruits, at only those branches of the army short of manpower, or even at only those specific regiments experiencing recruitment difficulties. Finally, so long as civilian wages moved up and down, this practice would not degrade the overall quality composition of the army. Because soldiers served for several years, the induction of lower quality recruits caused by rising civilian wages in one year would be offset by the induction of higher quality recruits in response to falling civilian wages in subsequent years. Only a prolonged and sustained rise in civilian wages would cause this practice to undermine the quality composition of the British army.
This is exactly the situation that confronted the British army in the late 19th and early 20th centuries. The expansion of British trade fueled the sustained rise of civilian wages, forcing the army to progressively lower its physical standards in order to maintain numbers. In 1860, the army’s modal recruit was a healthy man from a rural background who met relatively high physical standards; by the eve of World War I, he was shorter, younger, less healthy, and from an urban environment (Levi, 1997:54). The erosion of physical standards is most visible in the dramatic decline in the minimum height requirement for infantry recruits. In 1861, the minimum acceptable height for an infantry recruit was 5’8” tall; by 1913, it was only 5’3” after falling to an all-time low of 5’0” in 1902 (Inspector General of Recruiting, 1861–1914; Skelley, 1977:237–238).

To measure the quantitative impact of British trade on quality standards, we examine the association between total trade and the minimum height requirement (in inches) from 1861 to 1912. To control for other factors that may have affected army recruitment, we include seven additional independent variables. Our basic statistical model—used here and elsewhere in the article—takes the form:

\[ DV_t = \beta_0 + \beta_1 \times \text{TRADE}_t + \beta_2 \times \text{UNEMPLOYMENT}_t + \beta_3 \times \text{INFLATION}_t \]
\[ + \beta_4 \times \text{GDPPC}_t + \beta_5 \times \text{EMIGRATION}_t + \beta_6 \times \text{CARDWELL}_t \]
\[ + \beta_7 \times \text{BOERWAR}_t + \beta_8 \times \text{EFFECTIVE}_t + e_t \]

TRADE measures the level of British exports and imports. We measure British trade broadly since both exports and imports potentially affected relative prices in the domestic economy. As the effect of trade on army quality standards operated through civilian wage levels, we include two business-cycle control variables that might also be expected to affect civilian wages. UNEMPLOYMENT measures the civilian unemployment rate in Britain, while INFLATION indicates the change in consumer prices. We also add control variables for British prosperity and labor flows; GDPPC measures the annual growth in Britain’s Gross Domestic Product on a per capita basis, and EMIGRATION measures net British emigration (emigration minus immigration).

Because a shift in the demand for new recruits could cause analogous effects to the ones we hypothesize, we use three independent variables to control for the demand for recruits. CARDWELL controls for the impact of the Cardwell reforms. These were instituted in stages between 1870 and 1874 and set the basic structure of the British Regular Army in this period. They sought both to rationalize the army by pairing home regiments with regiments serving abroad and to create an army reserve by allowing soldiers to enter the reserves after serving six years of the twelve-year term. We code the Cardwell reform variable as 1 from 1871 to 1906 when these reforms became superseded; otherwise it is 0. BOERWAR is a dummy variable that controls for the impact of the Boer War. The Boer War dummy takes on the value of 1 for the years 1899–1902; otherwise the variable is coded as 0. Finally, EFFECTIVE measures the ratio of the “effective” strength of the

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7 We focus on height standards because this is the standard that is most consistently reported in British Army medical and recruitment statistics.
8 Data from Mitchell.
9 We do not control for civilian wages because our theory holds that trade affects army recruitment via its effect on wages. Because civilian wages are an intervening variable and the expansion of trade is causally prior to rising wages, we model the effects of trade rather than wages. We obtain statistically similar results if we substitute a wage series for the trade series.
10 The data for these variables are provided by Mitchell.
army (the actual number of soldiers) to its “establishment” strength (the size set by Parliament). The lower the ratio of effective to establishment strength, the greater the army’s recruitment efforts; conversely, when the ratio equaled or exceeded 1, the army suspended recruiting (Floud, Wachter, and Gregory, 1990).

Our results appear in model 1 (Table 1), which was estimated using Generalized Least Squares, correcting for serial autocorrelation in the time-series data. The estimate for the trade variable reveals that the expansion of British trade had a subtle, but statistically significant, effect on the minimum height standard. The estimated coefficient indicates that a £1 million increase in British trade was associated with a 0.006 inch decline in the height standard. Over the 1861–1912 period, British trade grew by £967 million, suggesting that the cumulative effect of trade over these five decades amounted to a decline of almost 6 inches. It is interesting to note that the business-cycle variables (unemployment and inflation)...

As is often the case with time-series regression, the OLS residuals exhibited statistically significant autocorrelation, limited to an AR1 process. We estimated $\rho$, a measure of first-order autocorrelation, and used the measure to transform all variables in the model according to the formula: $y'_i = y_i - (\rho y_{i-1})$. This transformation, which is a form of differencing conditioned on $\rho$, has the effect of making the time-series data stationary, reducing concerns about spurious results. As Granger and Newbold (1974) suggest, a regression where $R^2 > DW$ $d$ indicates spurious results (assuming a positive AR1 process). This inequality does not hold for our results. The partial differencing procedure is preferable to full differencing as full differencing a nearly nonstationary (or stationary) time-series creates specification error (Ahtola and Tiao, 1983).

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Table 1. Estimates of Trade on British Army Recruitment

<table>
<thead>
<tr>
<th>Model #</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Minimum Height Requirements, 1861–1912</td>
<td>51</td>
<td>GLS</td>
<td>-0.006***</td>
<td>1.99</td>
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<td>Percent Rejected, 1882–1912</td>
<td>31</td>
<td>OLS</td>
<td>-0.025***</td>
<td>0.15</td>
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<td>Percent 64 Inches or Under, 1887–1907</td>
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<td>GLS</td>
<td>0.034***</td>
<td>-0.56</td>
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<tr>
<td>Percent 120 lbs. or Under, 1887–1907</td>
<td>23</td>
<td>OLS</td>
<td>0.034***</td>
<td>-0.76</td>
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<tr>
<td>Trade</td>
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<tr>
<td>Unemployment</td>
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<td>Inflation</td>
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<td>GDP per capita</td>
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<td>Emigration</td>
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<td>Boer War</td>
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<td>Prob &gt; F</td>
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<td>Durbin-Watson d</td>
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Numbers in parentheses are $t$ statistics. Statistical significance indicated by:

***p < .01, **p < .05 (two-tailed).
tion) do little to explain changes in the height standard, suggesting that the decline in military standards is best understood as a long-run phenomenon.\textsuperscript{12} On the other hand, the Cardwell reforms made the army’s recruiting problems more severe. A major feature of these reforms was to allow recruits to enter the reserves after serving only six years of the twelve-year term of duty. Because more recruits took this option than expected, the Cardwell reforms paradoxically increased the army’s annual need for new recruits (Skelley, 1977:254).

Moreover, the decline in minimum height standards substantially understates the true erosion of physical standards for army recruits. For example, the army also inducted a high number of “special enlistments” that failed to meet one of the army’s minimum physical standards. These were usually boys or underdeveloped men who, in the examining officer’s opinion, could grow to become efficient soldiers (Spiers, 1980:40; Skelley, 1977:238). In 1892, the army conceded that these special enlistments amounted to 32 percent of all recruits in the previous few years (Skelley, 1977:238). Between 1892 and 1901, when the army was forced to report this statistic, an annual average of 27.7 percent of inducted recruits failed to meet the army’s physical standards, ranging from a low of 18 percent in 1896 to a high of 34.3 percent in 1899. Nor were the standards demanding. The army’s minimum physical requirements at this time were for a soldier to weigh 115 lbs., be 5’3” to 5’4” tall, and have a chest size of 33”. Although special enlistments fell to less than 2 percent of recruits after 1902, this was not due to an improvement in the physical quality of recruits, but, as the army acknowledged, to falling physical standards and the greater discretion given to army medical officers to interpret them in practice (Inspector General of Recruiting, 1904:12). Moreover, the army’s intake of special enlistments was directly related to the state of British economy. For example, one annual report of the Inspector General of Recruiting notes that “January was an exceptionally good month [for recruiting but] . . . a change then set in, probably owing to the increasing demand for labour and the exceptionally flourishing state of British trade, and recruiting for the next seven months fell off seriously . . . while the percentage of recruits enlisted under standard materially increased” (Inspector General of Recruiting, 1899:2).

\textit{Falling Rejection Rate}

Our second hypothesis is that rising trade, by increasing the civilian demand for labor, will cause the army’s rejection rate for recruits to fall by forcing the army to reach deeper into the available pool of recruits in order to maintain numbers. All potential recruits underwent an examination by an army medical officer to ensure their fitness for military service. The results of these examinations, especially the proportion of potential recruits rejected for falling below the army’s physical standards, were reported in the Annual Reports of the Army Medical Examiner from 1882 to 1912, giving us the opportunity to explore our hypothesis rigorously.

To estimate the effect of trade on the rejection of potential army recruits, we use the statistical model presented earlier in equation (1). We find the TRADE\textsuperscript{13} variable to be a statistically significant predictor of the proportion of potential recruits rejected for military service (model 2, Table 1). A £1 million increase in British trade was associated with a 0.025 percentage point decrease in the proportion of potential recruits rejected for military service. Our rejection data cover the 1882–1912 period, suggesting that the cumulative effect of rising trade during this period was a decline of nearly 16 percentage points in the rejection

\textsuperscript{12} This result is not due to collinearity between these two variables; even when we drop one of the business-cycle control variables, the other fails to achieve statistical significance.
rate. The positive coefficient on GDPPC indicates that as prosperity increases, the army is able to reject a higher percentage of recruits, a somewhat “choosier” stance made possible because stature and health of the population increase as national income rises (Floud, Wachter, and Gregory, 1990). However, the Boer War is associated with a lower percentage of rejections as the army becomes more desperate to fill out its expanding ranks. Once again, rejections do not seem to vary with the business cycle.

Eroding Quality Composition

Our third hypothesis is that rising demand for labor in the civilian economy, coupled with the fall in physical standards for army recruits, will lead to an influx of less qualified men into the ranks, thus eroding the quality composition of the British army over time. The most compelling evidence for this hypothesis is the high percentage of special enlistments failing to meet the army’s low physical standards. As noted above, these amounted to more than one-fourth of all recruits from the mid-1880s to 1901. The Wantage Committee found the high rate of special enlistments troubling, “especially in view of the fact that in spite of them the Army has been considerably below its establishment,” and argued that special enlistments only eroded the quality of the British army (Wantage Committee, 1892:10). Its report (10–11) stated:

[The Committee] cannot but feel that the existence of a standard is in itself a proof of its not being thought desirable generally to go below its limits; and they, therefore, have no hesitation in saying that the enlistment of any large number of men below the present standard of 5 feet 4 inches in height, 33 inches round the chest, and 115 lb. in weight, is to be deprecated. . . . The Committee feel it their duty to point out clearly that men . . . who, in the words of the General Officer commanding at Aldershot “cannot do a day’s service even in England,” ought not to be classed as effective soldiers

Unfortunately, the army’s lowered standards and changed reporting practices in the early 1900s obscure the extent to which special enlistments continued to make up a substantial portion of each year’s recruiting class. Nonetheless, there are other indications that the quality composition of British recruits (and the army in general) eroded over time. “[It] is unsatisfactory,” the 1904 Annual Report of the Inspector General of Recruiting noted, “that such a large number of lads should fail, for various reasons, to attain the standard required for entrance into the Army, a standard which cannot be considered exacting” (1904:30). Likewise, in 1909, 80 percent of the 34,731 recruits approved for military service were under 5’8” tall, the minimum required height for infantry recruits in 1867, the last year before minimum height requirements began their precipitous decline. In fact, the declining quality of British soldiers prompted an official inquiry into whether the poor quality of recruits reflected an overall decline in the health of the general population. The inquiry concluded, however, that the general population’s health was not declining; rather, civilian wages were rising, which meant that the army now drew the bulk of its recruits from those segments of society least fit for military service. As John Tweedy, president of the Royal College of Surgeons, testified:

Increased competition in trade, keener industrial rivalries, the growing responsibilities of employers, the “labour movement,” trades-unions, and other social and economic factors have altered the conditions of labour, and raised at once the comparative standard of efficiency of the workman, the standard of living, and the rate of wages. In the struggle for employment the better educated, the more intelligent, and the more active and industrious are attracted to the better
paid and more coveted occupations. The result is a large, and probably growing, remainder of those who, more or less unfit, fail to obtain regular employment. And it is apparently from this residue that the Army has to obtain the larger proportion of its recruits. (Inter-Departmental Committee on Physical Deterioration, 1904:99; emphasis in original)

To discern whether trade affected the distribution of the physical stature of inducted recruits, we estimate equation (1) using as dependent variables both the percentage of new recruits entering the army 64 inches tall or under and the percentage of recruits 120 pounds or under between 1887 and 1909. These were the lowest classifications in the years in which the army reported this data. We expected that rising levels of trade would force the army to induct greater numbers of recruits toward the lower tail of the distribution. Models 3 and 4 (Table 1), indicate that a £1 million increase in trade is associated with a 0.034 percentage point rise of inductees 64 inches in height or less as well as a 0.034 percentage point rise of inductees 120 pounds or less. From 1887 to 1907, British trade grew by £451 million, suggesting that expanding trade over this period was associated with an increase of 15 percentage points in the proportion of recruits that fell under either of these standards. Consistent with our earlier rejection rate results, the GDPPC variable is significant and in the opposite direction of trade, suggesting that the negative effects of trade are partly offset by the fact that the average stature of the population increases as national income rises.

Consequences for the British Army, Politics, and Strategy

Britain’s growing difficulties in recruiting adequate numbers of high-quality recruits had a number of important implications in the decade and a half before the war. Britain’s chronic recruiting problems and the poor quality of its soldiers were widely believed to be an important cause of the army’s abysmal performance in the Boer War. This spurred the successive secretaries of state for war in the early 1900s, Brodrick, Arnold-Foster, and Haldane, to seek to improve the quality of British recruits by increasing pay; prompted a government inquiry that identified rising civilian wages as a primary source of the steady decline in the quality of British recruits; and even sparked the growth of private youth associations, such as the Boy Scouts, whose purpose was to enhance the quality of potential recruits by raising the physical and moral qualities of British youth.¹³ These efforts achieved little. By the early 1900s the gap between military and civilian wages was substantial. In 1901, Brodrick doubted that “any increased pay we could give, unless we give something like double, would really bring in a different stamp of recruit” (Spiers, 1980:55). But increases of this magnitude were simply impossible. Closing the gap between military and civilian wages had grown too expensive to be politically sustainable (Skelley, 1977:185; Spiers, 1980:54).

Nor did the army’s traditional coping mechanism for its recruitment difficulties, lowering standards to expand the pool of recruits, provide a workable solution. By 1905, the army’s recruiting standards had bottomed out. “The infantry standard,” an assessment for the prime minister noted, “is already so low that it can hardly be decreased” (British Cabinet, 1905). In terms of our theoretical model (Figures 2 and 3), because the army could no longer respond to upward shifts in the supply curve by lowering standards, it now faced only a single supply curve ($S_1$) for military labor. The expansion of trade had rendered the institution of selective recruitment meaningless. Future upward shifts in the supply curve would translate directly into shortages of recruits.

¹³ The Boy Scout motto BE PREPARED, as Travers notes, specifically referred to military preparedness. “BE PREPARED to die for your country . . .” wrote Baden-Powell in Scouting for Boys, “so that when the time comes you may charge home with confidence, not caring whether you are to be killed or not” (Travers, 1979:280).
Although an economic slump after 1905 provided a temporary reprieve from this predicament, this was precisely the situation that confronted the army when trade and economic activity resumed after 1909. In 1911 the army admitted that a flourishing economy and rising demand for civilian labor left recruiting “in a very bad state,” and believed it unlikely that “any improvement will ensue in the near future” (War Office, 1911c). In 1912, recruiting for the infantry threatened “to become serious before long unless a considerable improvement takes place in the number of eligible recruits coming forward” (Inspector General of Recruiting, 1912:21). In fact, between 1910 and 1913 Britain needed to recruit 34,000 new soldiers each year to maintain its existing troop levels, but managed to attract an annual average of only 28,577, implying a shortfall of over 20,000 troops by the eve of the war, a number that represented more than 10 percent of the “striking force” intended for overseas conflict (French, 1982:24). Moreover, army actuaries estimated that the army would experience an additional shortfall of 19,000 recruits in 1914 (Spiers, 1985:44). Only the outbreak of war averted a serious crisis. Not only had the expansion of trade, and the corresponding rise in civilian wages that followed from it, gutted the physical quality of army recruits and rendered selective enlistment meaningless, they were now forcing a de facto contraction of the British army, despite Britain’s growing strategic need for effective land power.

The recruitment crisis intensified anxieties about the army’s fighting abilities. Britain now drew recruits from the least fit segments of society, raising concern among many officers as to the quality of British soldiers (Travers, 1979). This was especially true when compared with the continental armies, which, because of conscription, drew from a much broader pool of manpower. In 1904, the Secretary of State for War, Arnold Forster, complained that the home battalions were in “pitiable” condition, noting that 35,860, or nearly 60 percent of the troops, had less than two years’ service, and that of these troops, nearly two-thirds were under the age of 20 and ineligible to serve abroad (War Office, 1904c). In 1907 Colonel à Court Repington, the Times military correspondent and, until forced to resign by a divorce scandal, one of the army’s most brilliant rising young officers, compared the quality of British and German soldiers in testimony before a subcommittee of the Committee of Imperial Defence. “Although [German] service is short,” Repington testified, “the men are older than our young entry at home. They are naturally superior in physique and education, because the army has the pick of the population instead of the residuum” (British Cabinet, 1908). The General Staff noted in 1912 that because “the French Army represents every class of society, the intellectual average [of the French soldier] is far higher than that which we are accustomed to find in the British service” (War Office, 1912c). Perhaps the most scathing indictment of the quality of British recruits was delivered by Lord Roberts, Britain’s most distinguished soldier, in 1907 to the subcommittee of the Committee for Imperial Defence:

> [W]hen I see the skeletons to which our Regular Battalions of the line are reduced at home; when I observe the youth of the boys in the ranks . . . I fear that our brave young fellows at home will fight under conditions of extreme disadvantage. [If] you think your skeleton Regular battalions of immature boys, supported by your second line, which will not stand a week’s serious campaigning without dissolving into its primary elements, is going to withstand and defeat such troops as Germany can throw into this country in time of war, you must believe that history contains not one word of truth and you may as well believe that streams flow backward to their source. (British Cabinet, 1908)

In fact, the poor quality of recruits appears to have directly affected the British Army’s training, tactics, and performance in World War I. In addition to their poor physical stature, very few recruits on the eve of the war could read and write.
despite the introduction of universal education more than forty years earlier. Between 1907 and 1913 11 percent of all recruits were illiterate; 40 percent could not pass the educational standards for nine-year-olds; and 70 percent could not pass the standards for eleven-year-olds (Spiers, 1980:65–66). Sir William Robe-erton thus described army training as “largely a case of trying to make bricks without straw,” while the British Army admitted in 1911 that German conscripts received more training in two years than British recruits in four (Spiers, 1985:47; Samuels, 1992:162). Training itself concentrated on improving the skills and unquestioning obedience of individual soldiers at the cost of the overall combat capabilities of British units (Samuels, 1992:164–165). In the first days of the war, Sir John French, commander of the British Expeditionary Force, repeatedly argued that the poor condition of the troops prevented him from counterattacking the advancing Germans (Miller, 1979:133). Moreover, the army’s wartime performance was routinely criticized for an over-reliance on junior officers to perform tasks that in other armies were left to enlisted men, an over-emphasis on the unthinking obedience of the soldier, a lack of battlefield initiative especially among lower ranks, and rigid tactics of frontal attack. A study by Martin Samuels (1992) concludes that these problems originated in the attitudes and philosophy of the prewar army, while T. H. E. Travers argues that these problems were caused in part by the widespread perception among the prewar officer corps of the “cultural degeneration” of British society and the decaying moral and physical qualities of British soldiers (Travers, 1979, 1987). Given the dramatic decline in the quality of the prewar recruit, this perception, and the tactical rigidity that followed from it, is readily understandable. At the onset of the war rank-and-file recruits averaged five inches shorter than men of officer rank, who were almost exclusively from Britain’s middle and upper classes (Parker, 1987:160n, 163).

Because Britain’s institutions of voluntary enlistment and selective recruitment could no longer generate enough recruits under the impact of increasing trade to meet the state’s strategic needs, pressures grew substantially to replace them with a set of new institutions that would generate sufficient manpower (see Figure 1). As early as the 1890s, Wolseley proposed a form of compulsory service as a solution to the army’s many deficiencies (Ryan, 1980:9). In 1901 Brodrick threatened conscription as the logical consequence of Parliament’s failure to raise army wages and solve the recruiting crisis. “My adhesion to the voluntary system,” Brodrick argued before Parliament, “is strictly limited by our ability to obtain under it a force with which our military authorities can satisfy the government that they have sufficient force to resist invasion” (Spiers, 1980:243). In 1902 the National Service League was founded to advocate compulsory universal military training and grew to some 270,000 members before the war (Adams and Poirier, 1987:11). Lord Roberts assumed the League’s leadership in 1905, and became conscription’s most vocal advocate, arguing publicly that universal military training was needed for home defense and privately that it was essential to waging a successful war on the Continent (Adams and Poirier, 1987:12–15; French, 1982:24). Moreover, the upper ranks of the army and general staff were solidly conscriptionist, believing that to prevail in modern warfare required mandatory service (Adams and Poirier, 1987:26–27). Conscription advocates even deliberately fanned invasion scares in the decade before the war in an attempt to open the political space necessary to implement compulsory service (Ryan, 1980).

But conscription was not a panacea. The source of Britain’s problems in raising an army lay not so much in the institutions by which it mobilized labor from the civilian economy, whether voluntary enlistment or conscription, but in the fact that Britain’s deepening integration into the world economy pushed up British wages and raised the opportunity costs of military service for the potential recruit. Under voluntary enlistment, these rising costs were borne directly by the state. The need to compete in the open market for labor forced the state to
fully compensate its soldiers for these costs by offering opportunities at least as attractive as those available in the civilian economy. Conscription, however, would shift these costs onto the soldiers themselves, because it would enable the state to simply compel military service from its citizens. In other words, those who advocated conscription advocated an institutional reform that would not counteract the rising opportunity costs of military service so much as shift the burden of paying for them from the state onto Britain’s young working class men and their families. And because the state would no longer pay market wages for their military service, this proposed institutional reform amounted to an uncompensated seizure of working class labor power, an outcome certain to generate the deepening popular hostility to military service similar to the widespread popular antimilitarism that threatened social stability on the Continent (Ferguson, 1998: 1–30; Rowe, 2002).

Moreover, the expansion of trade in the years before the war vastly compounded the problems that confronted Britain’s political and security elites in finding any solution to the country’s deepening strategic predicament. On the one hand, the expansion of trade generated demands for social insurance policies that cushioned the working class from the risks inherent in growing exposure to international economic forces (e.g., Cameron, 1978; Katzenstein, 1985; Rodrick, 1997). These social demands competed with the military for use of the state’s powers of taxation and budget. Increases in social insurance, tax reform, and tight control over military expenditure were thus central elements of the Liberal party program. As A. K. Russell writes, the central thrust of Liberal policy was the realization that “Free Trade maximized wealth but did not look after its distribution,” so that “what was really needed was wise legislation which would ‘correct the errors of . . . distribution, spread the national wealth more evenly, and give every man and woman a chance’” (Russell, 1973:72). On the other hand, the expansion of trade deepened societal resistance toward conscription. The more trade increased civilian wages, the more onerous became the burden that compulsory military service would impose on Britain’s working classes, and the greater the resentment this step would generate among affected segments of the population. Thus, at the same time that the expansion of trade made institutional changes such as conscription more necessary to protect Britain’s strategic interests, it also made them more difficult to achieve.

In the end, compulsory military service proved impossible. For Britain’s Liberal and Labour parties, conscription promised to create an electoral backlash, while for the Conservatives, conscription would only fan domestic unrest and energize the political opposition (Adams and Poirier, 1987; Friedberg, 1988:289–290). In the absence of a clear and compelling national emergency, there were simply no political advantages to any political party that advocated conscription. As David Lloyd George noted in 1909:

I doubt whether we are getting our money’s worth [from the army] in any direction. I am strongly of the opinion that even the question of compulsory training should not be shirked. [Yet] no Party dare touch it, because of the violent prejudices which would be excited even if it were suspected that a Government contemplated the possibility of establishing anything of the kind. (Adams and Poirier, 1987:45–44)

More generally, the expansion of trade imposed a significant constraint on Britain’s search for a strategy to maintain the European balance of power. The more trade expanded, the more it undermined the quality and effectiveness of Britain’s army, the more intractable it made the army’s recruitment crisis, the more it deepened societal resistance to conscription, and the more impossible became the task of building an army congruent with Britain’s strategic interests. The size of the British Army was therefore set not so much by its likely conti-
nental mission in the coming European war, but by the limited amounts of money and men that Britain could mobilize internally to man it (French, 1982:22-38; S. Williamson, 1969:100). Moreover, the fact that Britain could field only six divisions in its “striking force” limited its strategic options in a European conflict. Although the War Office explored a number of different plans to inject force into Europe, ranging from amphibious landings on the German coast to sending troops to Belgium, its forces were simply too small to unilaterally affect the course of a European land war. The only feasible alternative by which Britain might favorably tip the balance of a European land war was to deploy its forces on the French left flank (Gooch, 1994:295; French, 1982). In other words, the expansion of trade was indirectly responsible for tying Britain’s security to the land defense of France.

Finally, the army’s predicament was not caused by a conscious strategic decision to divert resources to the navy at the army’s expense. First, Britain’s internal strategic debate in the decade before the war made clear that military intervention on the Continent was necessary to preserve the European balance of power, one of Britain’s guiding strategic principles (Gooch, 1994; French, 1982; S. Williamson, 1969). Second, the army’s problems predated the naval arms race, and Britain experienced difficulties in raising an army throughout the five decades of expanding trade prior to 1914. The Anglo-German naval arms race led to skyrocketing naval budgets only after 1909 when the Admiralty reassessed the threat posed by German naval-building (Rogowski and D’Lugo, 1993).

Third, consistent with our argument, Britain also confronted similar substantial economic constraints on its ability to build and maintain the navy. Recent historiography shows that the primary impetus for the Edwardian naval reforms, including the Dreadnought revolution, was economic rather than strategic (Lambert, 1995a:641, 1995b; Sumida, 1995, 1989). Admiral Sir John Fisher, godfather of the Dreadnought revolution, was appointed First Sea Lord because he accepted the financial necessity to rationalize the fleet. Likewise, the 1904 redistribution of the fleet to home waters was made, not to concentrate force against Germany, but primarily to control naval spending (Lambert, 1995a:641). Consequently, budgets actually fell between 1904–1905 and 1907–1908, and did not exceed the level set in 1904–1905 until 1910–1911 (Sumida, 1989:table 3). Moreover, a principal reason to scrap a large number of ships as part of the redistribution was to mitigate an acute shortage of trained personnel (Lambert, 1995a:658). These shortages persisted up to the war and were attributed by contemporary actors to rising civilian wages (Rowe, 1999:204–205). In fact, had the war not intervened, Winston Churchill planned to abandon the battleship as the primary platform of British naval power, in large part for financial reasons (Lambert, 1995b). Finally, just as the Anglo-German naval arms race after 1909 demonstrates that Britain could generate substantial resources for the navy, the Boer War demonstrates that it could generate substantial resources for the army. Army spending between 1899 and 1903 exceeded total navy spending during the Anglo-German naval arms race after 1909 (Sumida, 1989:table 15).

Why, then, was Britain able to increase substantially the resources devoted to the navy after 1909 but not the army? We believe three factors are important. First, the rise in naval budgets was driven primarily by naval construction, extraordinary expenditures in which higher expenses in one year could be balanced by lower expenditures in subsequent years. Thus, Lloyd George agreed to Churchill’s costly 1914–1915 naval budget only because Churchill could commit to an absolute reduction in the budget the following year (Lambert, 1995b:618). On the other hand, increases in army pay, especially to rates high enough to solve Britain’s recruitment crisis, entailed substantial permanent increases in annual expenditure that could not be offset by lower spending in subsequent years. Second, the increase in naval budgets was facilitated by electoral considerations. The Liberal party’s electoral victories after 1906 enabled it to impose significant
new taxes on the upper classes (Rogowski and D’Lugo, 1993), while funds for naval construction could be directed to the Liberal Party’s constituents among industry and labor, particularly in the shipbuilding industry which was suffering an economic downturn, a fact that muted domestic opposition (Weinroth, 1971). Army spending did not benefit a similar set of constituents and soldiers did not enjoy the franchise, so there were no political advantages to raising army pay. The third, and by far most important reason, was that continued German naval construction after 1908 represented an unambiguous, compelling, and public threat to Britain’s security (Moll, 1965; Weinroth, 1971; Rogowski and D’Lugo, 1993). This threat enabled the navy to overcome the latent electoral opposition to higher military spending. The growing strategic importance of the army, however, arose from incremental factors such as the gradual shift of the European balance of power and the growing density of European land-borne transport. None of these developments entailed a similar, sudden, and dramatic threat to British security that would enable Britain’s strategic elites to overcome the obstacles to raising an army congruent with Britain’s changing strategic interests. As a consequence, Britain’s ability to raise an army was slowly strangled by the country’s deepening integration into the world economy. Had Germany not engaged Britain in a naval arms race, the navy too would have likely suffered a similar fate.

The Decay of the British Army, Institutions, and the “Demand Effect” of Trade

The expansion of British trade in the late 19th and early 20th centuries was a powerful economic force that exerted substantial pressure on Britain’s ability to raise an army. Given Britain’s domestic institutions for mobilizing labor into the military, the expansion of trade compelled the army to progressively and dramatically lower the physical standards of recruits as it struggled to maintain numbers. And, by ultimately rendering the institution of selective recruitment meaningless, this economic force also caused the de facto contraction of the army, even as the changing strategic environment created a greater need for effective land power. These difficulties, in turn, ignited a heated debate over conscription, an issue so potentially divisive that no political party would publicly advocate it; helped constrain Britain’s search for a new land strategy to one that tied the use of its army directly to the land defense of France; shaped attitudes of officers toward their men; and even led to the creation of new groups within civil society such as the Boy Scouts and the National Service League. These were large effects. Both the qualitative historical record and quantitative analysis show a clear link between these outcomes and Britain’s deepening integration in the world economy. This study thus supports the Rowe hypothesis that the expansion of the world economy in the late 19th and early 20th centuries progressively impeded the ability of the European great powers to mobilize labor for military purposes.

A number of further important implications also follow from this study. First, this study underscores the importance of a country’s domestic institutions in determining how international economic shocks manifest themselves as domestic outcomes. The specific ways in which the expansion of trade increased Britain’s difficulties in mobilizing labor—chronic shortages of recruits, the collapse of selective recruitment, and a dramatic deterioration in the physical quality of its soldiers—arose primarily from the fact that military service was voluntary. Potential recruits who did not want to serve could not be compelled by the state to do so. Consequently, the more trade raised civilian wages, the more attractive it made civilian life, the more it forced the army to take recruits at the very bottom of the labor market, and the more intractable it made the army’s manpower and recruitment problems. This outcome would not have emerged under conscrip-
tion, because this institution would have permitted the state to compel young men to perform military duty, regardless of their personal desire to do so. Under conscription, the expansion of trade and rising civilian wages would have had no discernible impact on the quality or quantity of labor available from the civilian economy. In fact, this was precisely why Britain’s military elites favored this institutional change: compulsory military service would end the chronic shortages and eroding quality of British soldiers caused by Britain’s deepening integration into the world economy.

At the same time, it would be a mistake to conclude that the ultimate source of Britain’s problems lay in its failure to implement institutional reforms such as conscription. Institutions only shape the forces that motivate social behavior, they do not cause them. The underlying cause of Britain’s recruitment difficulties was the rise in civilian wages caused by Britain’s deepening integration into the world economy. Conscription would not have affected this process, but only changed the way in which it manifested itself within British politics. By shifting the burden of paying for military service from the state—which would no longer pay market wages for soldiers—onto individual soldiers—who would now be compelled into service without offsetting compensation—conscription promised to generate substantial popular hostility against the state and military, resentment that would continue to deepen the more trade drove up civilian wages. Britain’s politicians clearly understood their predicament. They knew that voluntary enlistment was the only institution that prevented military service from becoming politicized under the impact of rising wages, and that the move to conscription meant throwing away the one institution that spared Britain from this potent source of domestic political conflict, which gripped all the other great powers of Europe. Although conscription would have yielded sufficient quantities of quality soldiers, the potential gains for Britain’s external security that this step entailed were far outweighed by bitter internal dissension and divisive political conflict which this step also entailed. In other words, conscription would have transformed the economic pressures on Britain’s ability to raise an army in ways that, as Herbert Henry Asquith later reflected, would have “split the Cabinet, split the House of Commons, split the political parties, and split the nation” (Adams and Poirier, 1987:16).

Second, this study demonstrates how institutions can interact in complex ways to shape social behavior. Voluntary enlistment and selective recruitment meant that the expansion of trade confronted Britain with an unpalatable choice—raising army wages and military budgets or cutting the quality of recruits. The division of authority over the army between Parliament, which set the demand for troops and military wage levels but was hostile to higher military budgets, and the War Office, which could not alter wages but was tasked with maintaining troop levels set by Parliament, meant that the most feasible mechanism available to the army command to fulfill its mandate with the expansion of trade was to expand the supply of recruits by marginally shaving its selective standards. Consequently, the effects of expanding trade emerged not in rising military wages which one might expect to be the “normal” market response to this change, but in the growing difficulties Britain experienced in raising an army, such as the decline in the physical quality of soldiers, the collapse of selective recruitment, and the various reactions that accompanied these developments such as the debate over conscription. These effects of expanding trade could be easily overlooked by studies not adequately sensitive to how institutions shape social outcomes.

Finally, this study demonstrates that the relationship between trade and military power is more complex than the conventional wisdom recognizes. This leads us to question the assumption that trade necessarily enhances a state’s military potential by increasing its ability to divert resources to the military sector, or what Hirschman terms the “supply effect” of trade. If this line of reasoning were correct, the 19th century expansion of trade should have eased the constraints on
Britain’s ability to raise an army. Instead, the opposite was true. Our findings not only contradict a strongly held conventional wisdom, they do so for the era’s most powerful state. The conventional wisdom falls short because it fails to recognize that trade also affects the demand for an economy’s resources. The pre–World War I expansion of trade raised British wealth and enhanced British productivity. But it did not make labor more freely available to the British army. By raising the demand for labor in the civilian economy, the “demand effect” of trade caused labor to become more expensive and more scarce, even as effective land power became more important to British strategy.

Scholars have long interpreted the decades before World War I as a period of British decline. By going against conventional wisdom to explore how the expansion of British trade during this era impeded Britain’s ability to build military force, we now have a deeper understanding of the sources of that decline. For international relations to continue to treat the relationship between wealth and power by assumption will obscure more than it illuminates and prematurely close off fruitful avenues of research into how a changing world economy affects the security politics of states.

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