

Garfinkel, Michelle R.; Skaperdas, Stergios; Syropoulos, Constantinos

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Trade, Insecurity, and the Costs of Conflict

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Michelle R. Garfinkel, Stergios Skaperdas, Constantinos Syropoulos

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Poschingerstr. 5, 81679 Munich, Germany

Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de

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Trade, Insecurity, and the Costs of Conflict

Abstract

Typically, economics assumes that property rights over productive resources or goods are perfectly defined and costlessly enforced. The costs of insecurity and the resultant conflict are, however, real and often economically significant. In this paper, we examine how international trade regimes affect the costs of conflict and, in turn, how the desirability of international trade is affected by these costs. We consider both domestic and international conflict. Trade openness reduces the costs of these types of conflict for countries that import goods whose production relies on supplies of contested resources. For countries that export such goods, trade openness intensifies conflict. The effect of conflict on the allocation of productive resources through prices under trade can also explain the “natural resource curse” and can overturn a country’s natural comparative advantage. Finally, we consider alternative channels through which trade can affect arming and conflict costs, with effects that can either improve or worsen international relations.

JEL-Codes: C720, C780, D300, D700, D740, F100, F510, F600.

Keywords: insecure resources, trade openness, the gains from trade, domestic conflict, interstate conflict.

Michelle R. Garfinkel
Department of Economics
University of California-Irvine / USA
mrgarfin@uci.edu

Stergios Skaperdas
Department of Economics
University of California-Irvine / USA
sskaperd@uci.edu

Constantinos Syropoulos
School of Economics
LeBow College of Business
Drexel University / Philadelphia / PA / USA
c.syropoulos@drexel.edu

“We cannot make war without trade nor trade without war.”

Governor-General of the Dutch East India Company to the directors of his company upon taking office in the early 17th century.¹

“If no Naval Force, no Trade.”

British Governor of Bombay Charles Boone in the 18th century.²

1 Introduction

Historians and social scientists have long debated how economic relationships matter for war and peace. Some insist that the “web of economics relationships ties the interests of countries together, promoting peace by creating strong incentives to manage and resolve whatever conflicts arise rather than allowing them to escalate to the point of war.”³ According to this school of thought—the *liberal trade* school—trade reduces or even eliminates wars by bringing people of different creeds together and, by the carrot of gains from trade, incentivizes against war.⁴ Indeed, Angell (1933[1913]) thought that war was unthinkable on the eve of World War I because the great powers were so economically interdependent during that first period of modern globalization.⁵ Others maintain, by contrast, that most wars in the past were waged for economic reasons, such as control of vital natural resources and access to markets; and these ongoing economic relationships created conditions favorable to conflict. Since World War I is a prominent counterexample to the liberal trade school of thought, the possible positive effects of trade on conflict must be variable across time and can only be circumstantial at times.⁶

In this chapter, we discuss a strand of research in economics that tries to rigorously integrate considerations of conflict and peace into the economic theory of trade. While we also clarify some of the issues surrounding the liberal trade hypothesis, it is important to note that we do consider explicitly here a nation’s decision of whether or not to wage a violent war. Instead, we focus on incentives for the parties engaged in conflict to allocate resources to the military (or arm) to capture a larger share of whatever is being contested or to ensure a stronger bargaining position in peaceful negotiations. In this sense, our discussion could be considered as one that focuses on what Kenneth Boulding (1978) has referred to as a “stable peace.”⁷ Our analysis suggests that, even in such a setting, trade matters for the severity of conflict as it can further divert the allocation of resources

away from civilian uses (i.e., the production of goods for current consumption and investment that adds to future consumption opportunities) toward military uses.

Economics obviously pays much attention to the role of trade—from bilateral exchange between individuals to today’s complex international supply chains—as a critical determinant of material welfare. Nations, not to mention individual persons, nowadays cannot live in autarky without becoming paupers, and this necessity of trade and economic interdependence has been progressively becoming ever more important at least since the agricultural revolution.

The standard analysis in economics textbooks and much of academic economics, however, assumes that property rights over the resources used to produce goods and the goods to be traded themselves are perfectly secure and that security is costlessly enforced. In practice, as the quotes above indicate, the world is more complex. The Dutch East Company Governor-General suggested that trade and war were complements from his company’s perspective. If they made war and they didn’t trade then they could not make a profit; and if they traded without war, presumably they would run the risk of losing everything to those who could wage war on them. The latter also seems to be the point of the British Governor of Bombay as trade requires protection from potential predators. Another English East India Company official considered commerce not in terms of mutual exchange but rather as “a kind of warfare.”⁸

This connection between trade and the need to pay for security is not just an attribute of Western Colonialism. It has existed for as long as trade and states have existed, and it still exists today. Before European Colonialism appeared, the Eurasian trade across the Silk Road, for example, waxed and waned depending on the security conditions along this route. As Findlay and O’Rourke (2007) have argued, the first globalization episode was that created by the Mongol Empire in the 13th century.⁹ By encompassing territory from Europe to China and providing enhanced security, it allowed trade to expand throughout the Eurasian heartland.

In the postmodern world it might appear that neither navies nor armies are needed to support international trade; at least that might be the view to express in polite company. Nevertheless, the view expressed by former President of Germany Horst Köhler (for which he was subsequently forced to resign)

A country of our size, with its focus on exports and thus reliance on foreign trade, must be aware that military deployments are necessary in an emergency to protect

our interests, for example, when it comes to trade routes, for example, when it comes to preventing regional instabilities that could negatively influence our trade, jobs and incomes.

might be closer to reality.¹⁰ Are the hundreds of billions of dollars that the U.S. spends on the military unrelated to maintaining the present balance of forces in the international system and, particularly, of the international trading regime that exists today? What about the military expenditures by the rest of the world? Is the assumption of mainstream economics of complete and costless security connected to trade inconsequential for understanding the role of trade in the modern world?

In this chapter we argue that the answer to the last question is No. We first establish, by summarizing just a few contributions of the relevant literature, that the costs of conflict are large. Many of these costs result not just from violent conflict but also from security expenditures that potential, though not necessarily actual, adversaries make to deter attacks or to gain leverage in bargaining over contested resources or the scope of influence in global matters. Furthermore, while not all security expenditures are related to protecting trade routes, the substantial existence of conflict costs—regardless of whether they are explicitly linked to trade or not—can have consequences for the desirability of some forms of trade. Once having established that the costs of conflict are large, we examine how trade regimes—autarky and trade without geographical barriers or import tariffs (i.e., free trade)—and the costs of conflict can be related for two main different types of conflict: domestic and international.

With respect to domestic conflicts, we ask questions such as, how might greater integration of a country in the global economy affect conflict and the country's overall material welfare? Based on research that can be summarized using a simple graph, we argue that the presence of domestic conflict is crucial for determining the effects of trade. We focus on the case of conflict over resources, a frequent source of conflict in many poor countries.¹¹ For countries that import the contested resource or goods that use the contested resource in production, greater openness to international trade is highly beneficial. On top of the regular benefits of trade openness that typically exist in the absence of conflict, the country also enjoys a reduction in the severity of conflict (reflected in lower military spending or “arming”) as compared with an autarkic regime, since the country can purchase the contested resource more cheaply in international markets in this case. By contrast, for a country that exports the contested resource or goods produced with such

resources, greater trade openness implies that those who control the resource receive a higher price. This higher price, in turn, intensifies domestic conflict and its costs in ways that offset and can even overwhelm the benefits of trade, in which case the country would lose from opening its economy to trade in world markets.

Using similar arguments that highlight the role of trade openness to alter product prices and thereby influence the cost (and/or benefit) of producing guns and, as such, arming incentives, we discuss how international conflict over resources can have different welfare consequences for a country depending on whether it imports or exports the contested resource or the goods that use the contested resource under free trade. Importing the resource reduces conflict compared to autarky thereby adding to the benefits of openness that would be realized absent conflict, whereas exporting the resource increases conflict and its associated costs that can more than offset the benefits of openness.

For both domestic and international conflict, there are a variety of other important consequences. With prices of resources and final goods as well as the incomes of individuals depending on global market conditions, conflict over resources can give rise to such phenomena as the “resource curse”—where a higher price of an exportable good using the contested resource can be associated with lower incomes and welfare due to the increased conflict that higher price induces. And the “comparative advantage” of a country impacted by conflict is not set in stone: a country that would have imported a good produced with the resource if there were no conflict might actually export it in the presence of conflict.

We also touch on two other approaches that one can take in studying the effects of trade on international conflict and welfare. One of these approaches emphasizes the effect that a country’s arming can have on world prices that, in turn, influence the country’s terms of trade (or the world price of the good exported relative to the good imported) and its welfare. In comparison to the case where the adversarial countries remain in autarky, this channel of influence can reduce or augment their incentives to arm, depending on whether they trade with each other or with other countries not involved in the conflict. The second approach emphasizes the effect of trade to add to the current wealth of trading partners that face a positive probability of entering into a future dispute with each other. Through that channel, trade amplifies all countries’ incentives to arm and thus adds to the costs of conflict. If, however, countries are of roughly the same size, the normal gains from trade will exceed the added costs of conflict, such that both countries are better off under

trade. By contrast, if initial resource endowments are sufficiently uneven across the two countries, trade will induce a large enough shift in power from the larger country to the smaller country to make the larger country worse off.

2 On the costs of conflict

As of about a decade ago, the costs of the Afghanistan and Iraq wars to the U.S. were estimated by Stiglitz and Bilmes (2012) to have been between 4 and 6 trillion dollars.¹² This cost was about 25 to nearly 40 percent of US GDP at the time. Put differently, it amounted to more than five to eight times the cost of US social security expenditures in 2011. Interestingly, while social security expenditures are considered “unaffordable” or “unsustainable” by many, there is barely any public discussion of the costs of warfare. In any case, since Stiglitz and Bilmes did not explicitly consider the long-term effects and costs to Iraq or Afghanistan, let alone the costs incurred by other countries that might have been affected by these two wars, the true costs are likely to be much higher than their estimates.

Among the costs of conflict, we include the direct human and physical costs of warfare. But, we also include other direct and indirect costs of both actual warfare and those that arise in a “cold” war as countries or groups aim to increase their own security, to prevent others from having claims on them, or to increase the claims they have on others.¹³ Expenditures on weapons (such as swords, guns, tanks, F-35s and nuclear missiles) and military personnel that are not deployed in combat are considered costly, because they do not increase anyone’s final consumption of goods and services and, to the extent they cannot be employed elsewhere in the economy, they actually reduce the resources available for producing goods in support of current consumption and future consumption. To be sure, such expenditures may very well increase one’s own security or power; doing so, however, typically decreases the security and power of another side in a zero-sum fashion. What’s more, over short and medium time horizons, those expenditures could be partly avoided through diplomacy and other confidence-building measures. In the long run, they could be avoided through political and economic integration coupled with enforceable commitments that effectively eliminate conflict.

France and Germany, for example, fought two extremely destructive wars in the twentieth century and, as a result, suffered enormous human and economic costs. Yet, by the end of the

century, there were no perceived security threats across the Franco-German border and now the two countries devote virtually no resources to guard against one another. France and Germany do devote some resources to their respective militaries and intelligence efforts as well as to their domestic security; but such expenditures tend to be lower than those by the U.S. and a number of other countries.

Using an indirect method of measuring the “welfare” costs of conflict—a method adapted from other areas of economics—and using data on actual conflicts from 1954 to 2005, Blomberg and Hess (2012) estimate that, on average, consumption was 9 percent lower than it would have been in the absence of conflict.¹⁴ The variation across countries, though, is large, with rich countries—such as France and Germany—estimated to have suffered just a few percentage-points reduction in consumption, whereas the Democratic Republic of the Congo and Iraq were estimated to have suffered more than a 50 percent reduction. Blomberg and Hess consider those estimates as representing a lower bound of the true costs, partly because they measured the effect of actual conflict, not the resource cost of military and other security expenditures. Thus, while Saudi Arabia has had a relatively low welfare cost of conflict according to Blomberg and Hess’s estimates, it devoted 8.4 percent of its GDP in 2020 to military expenditures with the world average standing at 2.4 percent.¹⁵

It is evident that the costs of conflict absorb a significant percentage of the incomes of all countries, with those that are poorer and least able to afford diversions from consumption and investment having to devote more resources to security and conflict. Nonetheless, the typical assumption made in economics of perfect and costless enforcement of property rights over resources and goods could conceivably be inconsequential as far as different trade regimes are concerned. We explore this issue next in terms of both domestic and international conflict.

3 Trade and domestic conflict

In this section, we describe a very simple model of domestic conflict over an insecure resource to study the implications of trade.¹⁶ This model focuses on a single country that consists of two identical groups who contest ownership of the nation’s territory (or land) that contains valuable oil, a final good valued for consumption.¹⁷ Each group, which we think of as a unitary actor, is endowed with the same amount of labor, another factor input that can be employed to produce

“arms” (also referred to as “guns”). Whatever quantity of labor remains after arming can be used to produce another good for consumption—namely, butter. Payoffs depend positively on consumption of both oil and butter.

The two groups hold the butter and oil they produce and exchange securely. Since labor endowments are also held securely, the intergroup dispute concerns only the ownership of territory. In the absence of strong institutions of governance and enforcement, as observed largely though not exclusively in developing economies, the groups’ ownership claims are settled under the threat of war, which motivates their incentive to arm.¹⁸ Specifically, the two groups arm to secure a larger share of contested territory, with each group’s share depending positively on its own arms relative to those of the other group.¹⁹

Once the contested territory is divided, the two groups employ their respective shares to produce oil, and they employ their own secure holdings of labor (that remain after having armed) to produce butter. Production choices are made under perfectly competitive market conditions. Given those choices, the two groups then choose their consumption of oil and butter to maximize their own payoffs. This maximization problem is subject to a constraint that depends on the trade regime in place. Specifically, groups trade their goods either domestically only under “autarky” or both domestically and internationally under “free trade.”

3.1 Arming choices

Central to this analysis is how the groups choose their guns. In making this choice, each group accounts for the influence that an additional gun has on its payoffs through income. On the positive side, an increase in a group’s guns (given the other group’s choice) augments the share of territory it obtains in the resolution of the dispute and brings with it greater income generated from oil production. On the negative side, producing an additional gun diverts some of the group’s labor away from the production of butter and thus lowers the income associated with that. Each group’s optimal choice of guns balances these two marginal effects.

Because the two groups are identically endowed with labor, have identical production technologies and preferences, and face the same constraints, they will, in equilibrium, naturally choose the same quantity of guns. The remaining question is how many guns they both choose. The answer depends on the price of a unit of oil in units of butter—or the relative price of oil.²⁰

Observe especially that the higher is this relative price all else the same, the greater is the value of the marginal benefit of arming relative to the marginal cost, and thus the greater is the amount of guns produced by the two groups.

The relevant price itself depends on whether the country trades freely in world markets or remains under autarky. Our assumption that this country is small implies that, under free trade, participation by the two groups (or equivalently by the country as a whole) in world markets has no influence on the world relative price, which we denote by p_W . The relative price of oil under autarky, denoted by p_A , is determined to simultaneously clear the domestic markets for oil and butter based on domestic supplies and demands only. This autarkic price depends positively on the domestic supply of butter relative to the domestic supply of oil, which depends positively on the national supply of labor remaining after the production of guns and negatively on the nation's total endowment of (insecure) territory. Because arming uses labor only and does not affect the aggregate amount of territory available in the country, its effect on the relative price of oil under autarky p_A is negative.²¹

What is important here, for our purposes, is the ranking of the groups' (common) arming choices under the two trade regimes. That ranking depends on the ranking of those relative prices. If the world relative price of oil p_W happens to coincide with the autarkic relative price of oil p_A , arming incentives are identical under the two trade regimes. But, as p_W rises above p_A to imply an increase in the marginal benefit of an additional gun under trade relative the marginal benefit under autarky, trade causes the groups to arm by more, and thus effectively intensifies conflict between them. Conversely, as p_W falls below p_A , the marginal benefit of arming is smaller under trade, such that they arm by less; in this case, we can think of trade as pacifying domestic conflict.

3.2 Welfare implications

Let us now turn to the model's implications for equilibrium payoffs as they depend on the trade regime in place—autarky or free trade—and the associated relative price. Our assumption that the groups are identical implies that they arm identically as previously noted. That means they receive an equal share of territory, and their payoffs are identical.²² Accordingly, there is no need for us to distinguish between the two groups. Let V_A denote the representative group's payoff under autarky and V_T denote its payoff under free trade.

To start, we consider as a benchmark, the case we will henceforth refer to as “Nirvana,” where property rights are perfectly defined and costlessly enforced, and each group holds securely one-half of the country’s endowment of land. Since there is no dispute over land in this hypothetical (and ideal) case, neither group arms. Panel (a) of Fig. 1 shows the associated payoff under autarky (labeled V_A^N) and payoff under free trade as a function of the relative price under free trade p_W (labeled V_T^N). Importantly, as shown in the figure, in the case of no domestic conflict, each group’s payoff under trade is at least as large as that under autarky. The only point where they are equal is where the world relative price p_W equals the autarkic price p_A^N . At this price, the country does not trade at all. Instead, it consumes only the oil and butter it produces. As p_W falls below p_A^N (i.e., moves to the left of p_A^N in the figure), the country becomes a net importer of oil and exporter of butter; and, as p_W rises above p_A^N (i.e., moves to the right of p_A^N in the figure), the country becomes a net exporter of oil and importer of butter. The strictly higher payoffs under trade when $p_W \neq p_A^N$ represent the well-known gains from trade.

<Place Fig. 1 around here.>

Panel (b) of Fig. 1 shows the analogous payoff functions labeled V_A under autarky and V_T under free trade, when the dispute over territory is reintroduced. Comparing the two panels of that figure shows that the presence of this conflict shifts both curves down, reflecting the resource cost of arming and its distortionary effects on production and consumption.

The differences between the payoff functions under conflict V_A and V_T in panel (b) reflect two forces at play here: the already noted gains from trade and differences in arming under the two trade regimes. When $p_W = p_A$, there are no gains from trade, and as described above arming choices are identical under the two regimes. Hence, as shown in Fig. 1(b), the payoffs under trade V_T are identical to those under autarky V_A when $p_W = p_A$, just as we had in the Nirvana case.²³ Relative to the Nirvana case, however, V_T shifts down by more than does V_A such that its minimum value falls below V_A . For values of p_W less than p_A where the country imports the good using the contested resource, the gains from trade turn strictly positive and at the same time the groups’ incentive to arm fall in comparison to when they remain in autarky, implying that both groups are strictly better off under trade: $V_T > V_A$. In effect, both groups ambiguously gain under trade because the lower world relative price of oil (relative to the autarkic price) makes the conflict less severe and (as in the case of Nirvana) because they benefit from selling some of their butter for

more oil in world markets. When p_W is greater than p_A , implying that the country exports the good produced with the contested resource, the two groups again enjoy strictly positive gains from trade; yet trade also intensifies the intergroup conflict, inducing a greater production of arms and thus greater conflict costs. For values of p_W that are initially close to p_A , the added cost of conflict that comes with a higher p_W overwhelms the gains from trade, such that trade makes both groups worse off. As shown in the figure, additional increases in p_W eventually cause the gains from trade to rise by more than the added conflict costs (for $p_W \geq p'$ in the figure), such that trade again brings higher payoffs to both groups. Nonetheless, for values of p_W in the range (p_A, p') , trade is welfare reducing.

Above we have assumed that the country's entire land endowment is up for grabs. This is an extreme assumption but can easily be relaxed as noted earlier. Consider, in particular, an improvement in the country's institutions of governance and enforcement, such that the two groups hold securely equal shares of the nation's land endowment, leaving only a fraction of land that is insecure and contestable. With less to grab, such an improvement lowers each group's incentive to arm in equilibrium, bringing the outcomes under both autarky and trade closer to those under our ideal case of Nirvana. The welfare consequences can be visualized in Fig. 1(b) as an upward shift in both payoff functions, with V_T increasing by more than V_A . As one can show, the result is a smaller range in prices for which trade is welfare reducing for that country. Of course, such institutions do not come out of a vacuum and are costly to build and strengthen.²⁴ And, provided that some insecurity and conflict remain, the above analysis remains relevant.

3.3 Other implications

There are two other interesting results of the model that can easily be illustrated with Fig. 1. While pointing to the distortions that arise under trade with conflict in comparison to trade in Nirvana case, these two results underscore the importance of the careful measurement of data and the caution needed in interpreting those data.

Resource curse. The first implication can be seen by recalling, from Fig. 1(b), that the payoff under trade W_T falls as the world relative price p_W rises above autarkic price p_A to make the dispute over land more severe. W_T continues to fall until it reaches the critical price (denoted by p_{min} in panel (b) of the figure) that minimizes the payoff under trade. This result is reminiscent

of an empirical regularity known as the “natural resource curse,” studied by Sachs and Warner (1995) among others, that the national incomes of resource-rich countries tend to fall as the world price of the resource rises. To be sure, the logic of the resource curse in the context of our model differs because a rise in the world price of the resource (oil) always increases the country’s national income that derives solely from production of butter and oil. Instead, for values of the world relative price of oil p_W initially close to the autarkic relative price p_A , welfare falls because the rise in the price of the good produced with the contested resource p_W magnifies the severity of domestic conflict and this effect dominates the greater gains from trade.²⁵ Nonetheless, the distinction here is important because it suggests that national income (whether as conventionally measured to include expenditures on arming and more generally on security or as measured here excluding such expenditures) tends to overstate welfare and thus tends to understate the prevalence of the resource curse.

Reversal of comparative advantage. A country that has a lower opportunity cost in producing one good (say oil) over the other (butter) is said to have a comparative advantage in that good (oil). As such, the country exports that good under trade. The rationale for comparative advantage and thus trade in our model (based on the Heckscher–Ohlin model of trade) is due to differences in resource endowments and depends on the extent to which the country’s more abundant resource is used to produce the two goods relative to the country’s trading partner(s)—in our case, the rest of the world—which is reflected in the world relative price of oil that the country takes as given. In our model where oil is produced with territory only, oil is said to be produced “intensively” with territory; by contrast, butter is produced “intensively” with labor. Fig. 1(a) shows the implications under Nirvana. The small country we are considering imports oil when the world relative price is less than the autarkic price (i.e., $p_W < p_A^N$), implying it has a comparative advantage in butter in such cases. By contrast, when $p_W > p_A^A$, it exports oil, the good in which it then enjoys a comparative advantage.

Comparing panel (a) with panel (b) shows the possible distorting effect of domestic conflict on a country’s comparative advantage all else the same. Suppose, for example, that $p_W = p_A^N$. In this case, the country does not participate in trade under Nirvana; however, since $p_A^N > p_A$ the assumption that $p_W = p_A^N$ implies the country is a net exporter of oil and thus enjoys a comparative advantage in oil when domestic conflict is relevant. Indeed, for relative world prices p_W in the

range (p_A, p_A^N) , the country's comparative advantage would be in butter production under Nirvana, whereas it is in oil production in the case of domestic conflict. Hence, for these world relative prices, domestic conflict induces a reversal in comparative advantage. More generally, the contest over territory implies the production of arms that reduces the residual amount of labor available to produce butter (for any world price p_W), thereby tilting the country's comparative advantage towards oil. Accordingly, we can say that the country plagued by domestic conflict tends to over-export the good produced intensively with the contested resource and that results in an outright reversal of comparative advantage for a certain range of world relative prices.²⁶

4 Trade and international conflict

With some minor modifications, the model above can also be used to study how interstate conflict similarly distorts resource allocations and how those distortions interact with the trade regime in place.²⁷ Our focus here switches to a conflict between two identical (and small) countries that would not trade with each other but possibly trade with the rest of the world. Each country holds securely an identical amount of labor used to produce butter. Their dispute again concerns the ownership of some territory that is used to produce oil, and its resolution comes in the form of a division of the land, based on the relative guns the two countries produce, using labor only. The timing of events is identical to that described in the previous section.

The key difference between this analysis of international conflict and the previous one of domestic conflict has to do with the equilibrium determination of prices when those countries do not trade with the rest of the world. Specifically, each country i 's autarkic relative price of oil p_{iA} depends on its own market-clearing conditions. Nonetheless, our assumption that the two countries are identical implies that, in equilibrium, their relative prices of oil under autarky will be identical: $p_{iA} = p_A$. By the same token, under free trade, both face the same world relative price of oil p_W .

The implications for arming and welfare are like those described above in the case of domestic conflict. Countries' arming incentives are identical for any given trade regime, generally increasing in the relative price of oil. When $p_W = p_A$, their (common) arming choices are identical under the two trade regimes and there are no gains from trade, implying that $V_T = V_A$ as illustrated in Fig. 1(b). For lower world relative prices ($p_W < p_A$), a shift from autarky to free trade pacifies their dispute over land, causing both countries to arm by less than they would under autarky. In

this case, trade brings with it the benefits of mitigating their resource dispute on top the familiar gains from trade, to make both countries necessarily better off relative to autarky: $V_T > V_A$. But, for higher world relative prices ($p_W > p_A$), the conflict between the two countries intensifies under trade, inducing each country to devote more labor to produce arms. Of course, a shift to trade also generates gains from trade. However, when the world relative price p_W falls within the range (p_A, p') , the added costs of conflict swamp those added gains. Hence, for this range of world relative prices of oil, both countries are worse off under trade than under autarky: $V_T < V_A$. What's more the presence of conflict between countries distorts the pattern of trade, with each country tending to export more of the good produced intensively with the contested resource (oil).

One other result worth mentioning has to do with the countries' willingness to trade. In Garfinkel et al. (2015), we consider an extended game where, before countries arm and resolve the dispute over land, they choose noncooperatively whether to trade in world markets or to remain in autarky.²⁸ Despite the payoff dominance of autarky over free trade when the world prices p_W falls within the range (p_A, p') , both countries choose free trade in a noncooperative equilibrium.²⁹ Importantly, this finding suggests that freer trade policies, typically thought of as involving "cooperation" between countries that trade with each other, can lead to more perverse outcomes for countries in conflict, particularly if the conflict over resources can be resolved only with arming.

5 Additional channels of influence

The analyses of domestic and international conflict presented above highlight the role of trade to alter the prices of tradable commodities and thereby change the opportunity costs of employing resources in the production of consumption goods and guns. Through this channel, trade alters the contenders' arming incentives and the costs of conflict relative to autarky. In this section, we discuss two additional channels of influence: (1) the terms-of-trade channel; and (2) the income/wealth channel. Our consideration of these additional channels reveals the importance of the distribution of resources or, more generally, of groups' and/or countries' productive capabilities.

5.1 The terms-of-trade channel

While it may be appropriate to assume that there are small countries and groups within those countries whose arming decisions cannot influence world prices in an integrated global economy, there do exist relatively large players: large economies like those of the United States, China and the European Union, and large suppliers of certain commodities (e.g., oil, gas, iron ore, rare minerals and, more generally, raw materials) like Russia and Saudi Arabia. In such cases, the assumption of “small trading” economies (i.e., economies that treat the prices of tradable goods as given) would be unreasonable. An alternative and better approach would be to suppose that the governments of large countries do account for the impact of their military efforts on the world prices of tradable goods. Since policymaking is conducted noncooperatively under conflict, governments naturally consider how their military expenditures and the resulting domestic absorption and/or capture of foreign raw materials will affect the prices of the goods they trade—specifically, the relative prices of the goods they export (i.e., their terms of trade)—as these prices affect national welfare. The way world prices respond to international reallocations of contested resources due to arming and conflict, however, depends on trade patterns including whether trade occurs among adversaries or among friends.

To isolate the importance of the terms-of-trade channel, Garfinkel et al. (2020) analyze a model in which the direction of trade flows is determined solely by differences in technology across countries in producing distinct goods.³⁰ Suppose, for example, there are two countries and two consumption goods. Then, such technological differences would imply that one country tends to have a comparative advantage in producing one of those goods, whereas the other country tends to have an advantage in producing the other. To allow for conflict in this standard trade setting, the analysis assumes further that, while labor is secure and each country holds some secure land, there is an additional amount of land that is insecure and subject to contestation. Under autarky, each country combines its secure holdings of land and labor, after arms have been produced and the contested land has been divided, to produce (and then consume) both types of consumption goods. Under free trade, by contrast, each country tends to shift its production towards the good in which it enjoys a comparative advantage for consumption and for export in return for less expensive imports from abroad.

Importantly, in this setup, the option for adversaries to trade with each other tempers their arming incentives as compared with autarky. The reasoning is as follows. As the production of an

additional gun by one country shifts control of contested land to that country away from the other, that country expands its own export base, while reducing that of its rival. With a greater world supply of the good it exports and a smaller world supply of the good it imports, the world price of its exported good falls relative to the world price of its imported good—a deterioration in the country’s terms of trade that reduces its net marginal benefit of arming relative to when both countries operate under autarky. This logic applies to the other country as well. Thus, trade among adversaries could bring about less arming and thus be pacifying.³¹

The terms-of-trade channel, however, need not pacify international tensions. Suppose in contrast to what was assumed above that the two adversaries possess the same technology such that they would not trade with each other even in the absence of conflict between them. Instead, they compete in the same export market in world trade with outside and “friendly” countries. Relative to autarky, trade openness in this case implies an added marginal benefit to arming—namely, to undermine the rival’s comparative advantage by reducing its exports to world markets and thereby improving its own terms of trade with friendly countries. Consequently, trade openness can amplify arming incentives and aggravate international tensions.³²

The above discussion reveals that the dependence of the world market-clearing prices on arming decisions can play an interesting role in the presence of insecurity and conflict. Perhaps unsurprisingly, this role depends on the economic forces that shape countries’ incentives to participate in world trade. It can be either one that tilts the balance towards moderation and restraint in arming or one that tilts the balance towards more aggressive arming. More generally, the precise role of trade in international relations depends on the pattern of trade that depends on the structure of technology. In this next subsection, we argue that this role can also depend on the relative sizes (or resource bases) of the adversaries.

5.2 The income/wealth channel

Adam Smith (1776) made his stance on the relationship between national power and wealth abundantly clear.³³ Like the mercantilists before him, he argued specifically that a nation’s absolute power is positively related to its wealth (or real income). Unlike the mercantilists, however, who viewed the gains from trade by one country as a loss of wealth by another, Smith

argued that all participating countries benefit from trade. But if trade promotes overall prosperity what determines the relative power of trading nations?

Hirschman, in his classic *National Power and the Structure of Foreign Trade* (1945), addressed the above question theoretically and historically.³⁴ Keenly aware that the distribution of the gains from trade is central to the issue of national power, and that national power itself can determine the nature of a nation's trading relationships, he chose to emphasize foreign trade's effect on power.³⁵ In that context, he emphasized two effects of trade: (i) a "supply effect", which tends to improve a country's potential military power by enabling it to access raw materials and commodities of importance to defense; and, (ii) an "influence effect", which relies on trade actions or threats undertaken by one country to coerce other sovereign states into compliance by "means other than war." Interestingly, Hirschman found the latter effect more relevant and interesting for policy purposes, thus treating the former (along with some additional points related to it) as "...obvious and hardly [in] need [of] more elaboration."³⁶

In more recent contributions, political scientists (notably, Gowa and Mansfield) refine the link between foreign trade and national power, suggesting that trade among allies differs substantively from trade among adversaries in that the former generates positive security externalities whereas the latter generates negative security externalities.³⁷ In turn, according to them, these externalities express themselves in the types of self-enforcing trade agreements that nations would be willing to enter. Likewise, Srinivasan (1987) recognizes that the efficiency-enhancing effects of trade can enable countries to redirect resources toward military purposes.³⁸ Srinivasan also moves on to discuss optimal policy remedies. Until recently, however, this literature has remained silent on how the distribution of the gains from trade affects countries' arming incentives and the balance of power.

Garfinkel et al. (2022) address this issue in the context of a simple model of trade and arming during periods of peace to prepare for possible conflict in the future.³⁹ As suggested by Smith, Hirschman, Srinivasan and many others, countries can direct their real income (or wealth) gains toward military uses. Thus, each country's relative power depends on the distribution of the relative gains from (free) trade. A noteworthy feature of this more recent research is its characterization of the dependence of countries' relative gains from trade on primitive concepts—such as initial distribution of resource endowments among them, technology, and preferences. Importantly, there exists in general an inverse relationship between a country's relative size and

the gains it realizes from trade over autarky. To be more precise, smaller countries enjoy higher relative income gains from trade than their larger trading partners. A novel implication of this finding is that a shift from autarky to free trade puts into motion a set of responses by both trading partners that imply an increase in the smaller country's income, arming, and thus power relative to its larger trading partner. Perhaps more interestingly, while the larger country remains richer and more powerful, the implied erosion of the larger country's relative power induced by a shift from autarky to free trade can be sufficiently large to more than offset its gains from trade.

However, one cannot simply conclude based on the above arguments that relatively large and powerful nations will accept this reality. On the contrary, we would expect them to pursue their interests by other means. In fact, as Hirschman emphasizes, large countries would have a strong interest to use coercive trade policy or, no less plausibly, to manipulate the rules of the trading system to their advantage. Moreover, in bilateral interactions they would likely have sufficient market power to obtain valuable concessions. How various coercive policies might interact with other domestic and foreign policies, including military spending and foreign alliances, to promote national wealth and national security interests in such settings, remains an open theoretical question.

6 Concluding remarks

The costs of insecurity and conflict are substantial and, as we have seen, they matter in determining whether trade openness can be beneficial or not. While the emphasis of the modeling approaches we have discussed in this chapter differ, they all point to a tradeoff between the gains from trade and the additional (or in some cases lower) costs of conflict under trade. What's more, in all cases the prices of resources and other goods depend on the costs of conflict which vary with the type of insecurity and conflict that may exist. For example, prices of spices today differ substantially from those in Amsterdam and London three centuries ago. They are much lower now, and not simply due to lower transportation costs; in addition, intense military competition by the European powers for spice trade increased the risk and cost of bringing them to Europe.

Now, the costs of conflict and insecurity are neither set in stone nor inevitable. They depend on, and vary with, governance, institutions, and norms that, in turn, partly depend on history. While domestic and international institutions that rely on trust and support lower costs of conflict take

time to build, violence often begets violence and can condemn countries and regions seemingly forever.

A promising and arguably durable approach to managing conflict would involve the building of international organizations and institutions, such as those of the post-War World II era that appear to have reduced inter-state wars. Since the fall of the Soviet Union, however, those institutions have atrophied. The Afghanistan and Iraq invasions, for example, were undertaken without UN Security Council resolutions (even though the one for Afghanistan would have likely passed) and there have been a series of withdrawals from arms-control agreements (such as the ABM, INF, and Open-Skies treaties). Thus, it is urgent during this second era of globalization in the modern age to re-build international institutions of conflict management to reduce arming as well as prevent intentional or accidental wars, especially of the nuclear kind.

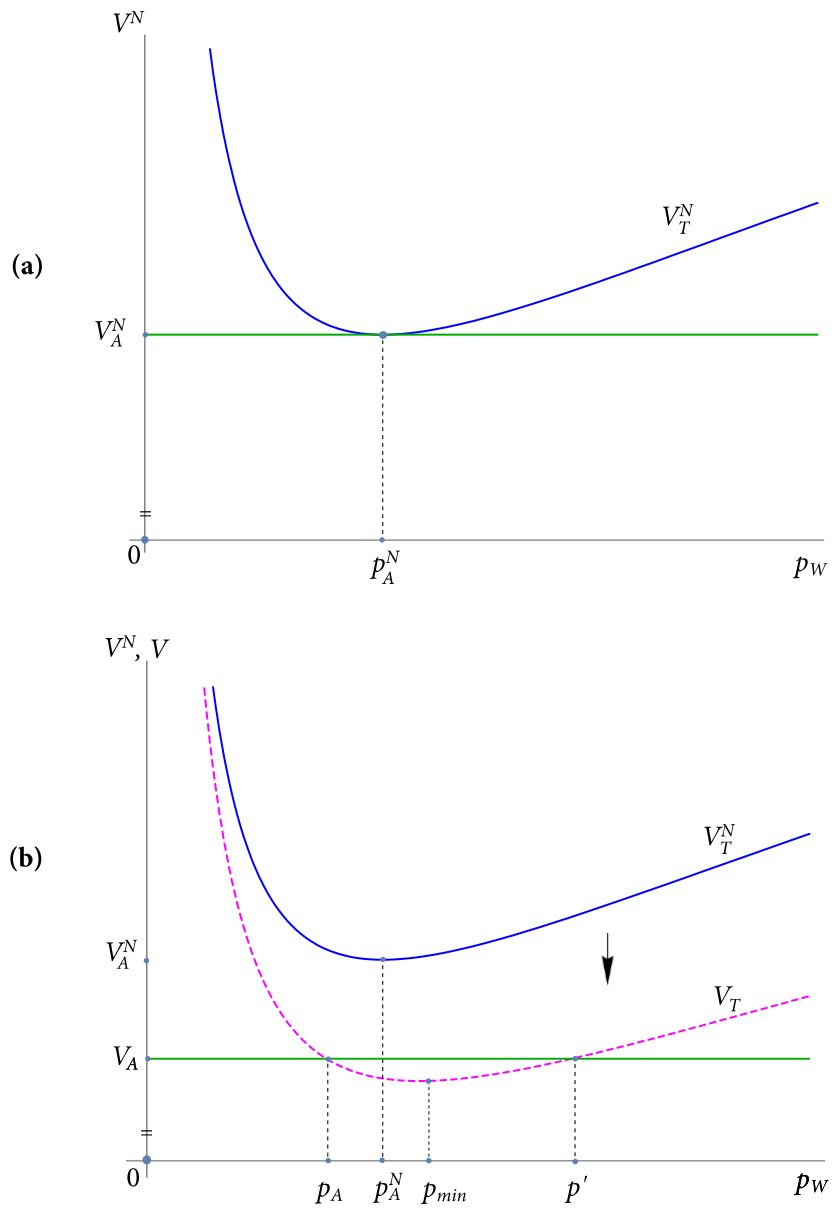


Figure 1: Payoffs under trade and autarky with and without conflict

End Notes

¹ Quoted in Ronald Findlay and Kevin O'Rourke, *Power and Plenty: Trade, War, and the World Economy in the Second Millennium* (Princeton: Princeton University Press, 2007), 178.

² Kirti N. Chaudhuri, *Trade and Civilisation in the Indian Ocean: An Economic History from the Rise of Islam to 1750* (New York: Cambridge University Press, 1985), 3.

³ Lloyd J. Dumas, "Economics of Peace," in Nigel Young, ed., *The Oxford International Encyclopedia of Peace* Vol. 2 (New York & London: Oxford University Press, 2010), 29.

⁴ See, for example, Solomon W. Polachek, "Conflict and Trade," *Journal of Conflict Resolution* 24, no. 1 (March 1980) 55-78.

⁵ Norman Angell, *The Great Illusion* (New York: G.P. Putnam's Sons, Second Edition, 1933).

⁶ See Roberto Bonfatti and Kevin H. O'Rourke, "Growth, Import Dependence, and War." *Economic Journal* 128, no. 614 (September 2018), 2222-2257, and Dale C. Copeland, *Economic Interdependence and War* (Princeton: Princeton University Press, 2015) for critical perspectives on the liberal school.

⁷ Kenneth Boulding, *Stable Peace* (Austin: University of Texas Press, 1978), xi. For a broader perspective of how economics has contributed to the study of conflict and peace, see Charles H. Anderton and John R. Carter, *Principles of Conflict Economics: The Political Economy of War, Terrorism, Genocide and Peace* (Cambridge: Cambridge University Press, Second Edition, 2019).

⁸ Jonathan Levy, *Ages of American Capitalism* (New York: Random House, 2021), 18.

⁹ Findlay and O'Rourke, *Power and Plenty*.

¹⁰ Quoted in Judy Dempsey, "German President Quits Over Remarks on Military," *New York Times*, May 31, 2010. <https://www.nytimes.com/2010/06/01/world/europe/01germany.html>.

¹¹ Resources that have and continue to be contested include, but are not limited to, land, water, timber, and oil (Michael T. Klare, *Resource Wars: The New Landscape of Global Conflict*. New York: Henry Holt and Company, 2001).

¹² See Joseph E. Stiglitz and Linda J. Bilmes, "Estimating the Costs of War: Methodological Issues, with Applications to Iraq and Afghanistan," in Michelle R. Garfinkel and Stergios Skaperdas, eds., *The Oxford Handbook of the Economics of Peace and Conflict* (New York: Oxford University Press, 2012), 275-317.

¹³ See Stergios Skaperdas, "The Costs of Organized Violence: A Review of the Evidence." *Economics of Governance* 12, no. 1 (March 2011), 1-23, for an overview of the different ways of measuring the costs of conflict among organized groups, including states.

¹⁴ See S. Brock Blomberg and Gregory D. Hess, "The Economic Welfare Cost of Conflict: An Empirical Assessment," in Michelle R. Garfinkel and Stergios Skaperdas, eds., *The Oxford Handbook of the Economics of Peace and Conflict* (New York: Oxford University Press, 2012), 412-475.

¹⁵ SIPRI, “Trends in World Military Expenditure, 2020,” Fact Sheet, Stockholm International Peace Research Institute (April 2021).

¹⁶ See Michelle R. Garfinkel, Stergios Skaperdas, and Constantinos Syropoulos, “Globalization and Domestic Conflict,” *Journal of International Economics* 76, no. 2 (December 2008), 296-308. For a related analysis, see Ernesto Dal Bó and Pedro Dal Bó, “Workers, Warriors, and Criminals: Social Conflict in General Equilibrium,” *Journal of the European Economic Association* 9, no. 4 (August 2011), 646-677.

¹⁷ While we assume that the country’s entire land endowment is insecure, allowing for partial land security is straightforward and yields additional intuitive results as described below.

¹⁸ An alternative (and, in this model, analytically equivalent) interpretation of the resolution their dispute would be through overt war, where the victor takes possession of all the territory. We could also consider the group’s choice of conflict resolution, between peaceful settlement where countries compete for shares of contestable land based on their military capacities and overt war where their relative military capacities determine their probabilities of winning. Provided that war destroys some fraction of resources, one can show that, given their arming choices, the two groups would choose peaceful settlement (Michelle R. Garfinkel and Stergios Skaperdas, “Conflict without Misperceptions or Incomplete Information: How the Future Matters,” *Journal of Conflict Resolution* 44, no. 6 (December 2000), 793-807). As suggested in our introduction, the analysis that follows could, then, be viewed as one about arming under peace.

¹⁹ Letting a superscript $i = 1,2$ identify groups 1 and 2 respectively, a simple specification for group i ’s share, denoted by s^i , is $s^i = G^i / (G^i + G^j)$ for $i \neq j = 1,2$, which is increasing in the group’s own guns choice G^i and decreasing in the other group’s guns choice G^j (Gordon Tullock, “Efficient Rent Seeking,” in James M. Buchanan, Robert D. Tollison, Gordon Tullock, eds., *Toward a Theory of the Rent-Seeking Society*, College Station, TX: Texas A&M University Press, 1980, 97-112). This conflict technology can be thought of as a reduced form representation of the process by which the two groups bargain in the shadow of war to divide the contested territory. (See Nejat Anbarci, Stergios Skaperdas, and Constantinos Syropoulos, “Comparing Bargaining Solutions in the Shadow of Conflict: How Norms against Threats Can Have Real Effects,” *Journal of Economic Theory* 106, no. 1 (September 2002), 1-16, for an analysis of how different bargaining protocols result in rules of division that differ with respect to their sensitivity to the groups’ guns; also see Michelle R. Garfinkel and Constantinos Syropoulos, “Rules for Dividing a Disputed Resource in the Context of the Classical Liberal Argument for Peace,” *Peace Economics, Peace Science and Public Policy* 24, no. 1 (February 2018), 1-16, who consider the implications of different bargaining protocols in the context of a simple trade model.) Under the alternative interpretation of conflict resolution mentioned in the previous footnote, s^i would represent the probability that country i wins the war to take secure ownership of all the country’s territory.

²⁰ Our assumptions regarding production imply that p also equals the price of a unit of land in units of labor.

²¹ Even though each group’s arming choice influences the autarkic price, one can show that both groups make this choice as if they have no such influence.

²² Due to the symmetry of the model, the two groups have no interest in trading with each other. If they trade at all, they trade only in world markets. If the two groups were to resolve their differences via overt war in a winner-take-all contest, their secure resource holdings subsequently

would differ, giving them an incentive to trade with each other under trade when the country remains in autarky.

²³ As shown in the figure and as one would expect given the previously described negative influence of arming on the equilibrium price under autarky, $p_A < p_A^N$ holds.

²⁴ Establishing property rights in land, for example, requires a legislative body with the ability to commit to the staying power of the laws it formulates, a title agency and trained civil servants, police, and courts to enforce the laws, the professional infrastructure of lawyers, judges, surveyors, and the belief that the process of securing title is routine and free of corruption.

²⁵ Stronger institutions of governance and enforcement would, along the lines described above, shrink the range of world prices for which the resource curse emerges (Garfinkel, Skaperdas and Syropoulos, “Globalization and Domestic Conflict,” 305-306). See Halvor Mehlum, Karl Moene, and Ragnar Torvik, “Institutions and the Resource Curse,” *Economic Journal* 116, no. 508 (January 2006), 1-20, who present empirical evidence that such institutions matter.

²⁶ Nigeria, an exporter of oil, is a country that has not done well in ways that fit the natural resource curse. Indeed, oil has been a source of domestic conflict, from the Biafra war of independence in the 1960s, to regular political rent-seeking over oil revenues, to the siphoning off of oil by arms gangs. One can imagine counterfactually that, if there were no conflict, Nigeria would be sufficiently richer now so that it could consume all of its own oil and even import more; that would be a case of reversal of comparative advantage.

²⁷ See Stergios Skaperdas and Constantinos Syropoulos, “Guns, Butter, and Openness: On the Relationship between Security and Trade,” *American Economic Review* 91, no. 2 (May 2001), 353-357. Also see Michelle R. Garfinkel, Stergios Skaperdas, and Constantinos Syropoulos, “Trade and Insecure Resources,” *Journal of International Economics* 95, no. 1 (January 2015), 98-114, who extend the analysis to allow for asymmetries across countries in endowments and production technologies (where each final good for consumption is produced with both resources).

²⁸ Garfinkel, Skaperdas and Syropoulos, “Trade and Insecure Resources,” 108-109.

²⁹ For a subset of those prices, free trade is the unique, dominant-strategy equilibrium, thus leading to a prisoner's dilemma outcome.

³⁰ Michelle R. Garfinkel, Constantinos Syropoulos, and Yoto V. Yotov, “Arming in the Global Economy: The Importance of Trade with Enemies and Friends,” *Journal of International Economics* 123 (March 2020).

³¹ Garfinkel, Syropoulos and Yotov “Arming in the Global Economy” also show, however, that trade between two adversaries can amplify arming incentives for one country, if that country is much smaller than the other. Nonetheless, even in such cases, trade lowers aggregate arming across the two countries.

³² Along similar lines, Philippe Martin, Thierry Mayer, and Mathias Thoenig, “Make Trade Not War,” *Review of Economic Studies* 75, no. 3 (July 2008) 865-900, find that greater opportunities for trade among all countries reduce the interdependence between any two countries and can therefore make conflict between them more likely.

³³ Adam Smith (1776), *The Wealth of Nations*, edited by Edwin Cannan (1904; repr. New York: Modern Library, 1937).

³⁴ Albert O. Hirschman, *National Power and the Structure of Foreign Trade* (Berkeley: University of California Press, 1945).

³⁵ In a reference to Adam Smith's work, Hirschman noted: "...immediately after having proved that nations derive a mutual benefit from foreign trade, Adam Smith points to an instance in which welfare may be increased to the detriment of the power position of the country: 'The wealth of a neighboring nation, however, though dangerous in war and politics, is certainly advantageous in trade'" (Hirschman, *National Power*, 6).

³⁶ Hirschman, *National Power*, 14.

³⁷ See Joanne Gowa, *Allies, Adversaries, and International Trade* (Princeton: Princeton University Press), 1995; and Joanne Gowa and Edward D. Mansfield, "Power Politics and International Trade," *The American Political Science Review*, Vol. 87, no. 2 (June 1993), 408-420.

³⁸ In Srinivasan's words: "...[the] strategic use of foreign trade substituting for the more violent instruments of war to achieve political objectives in international relations ... reflects concerns that unfettered trade with adversaries in certain commodities and services **will** only strengthen their military (offensive and defensive) capability. See T. N. Srinivasan, "The National Defense Argument for Government Intervention in Foreign Trade," in Robert M. Stern, ed., *U.S. Trade Policies in a Changing World Economy*, (Cambridge, MA: MIT Press, 1987), 337-363.

³⁹ Michelle R. Garfinkel, Constantinos Syropoulos, and Thomas Zylkin, "Prudence versus Predation and the Gains from Trade," *Journal of Economic Theory* 201 (April 2022).

Suggested Readings

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