Why Not Fight and Trade?

Dissecting the Logic of the Opportunity Cost Mechanism

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ABSTRACT

The opportunity cost mechanism – the idea that the costliness of forgoing trade during war causes states to remain at peace – is the foremost reason that trade is thought to cause peace. But, if trade is so valuable to states that it can prevent war, why do they choose to forgo it during war? The twin assumptions that trade ceases during war and that states greatly value trade are both plausible on their own, but they are surprisingly difficult to reconcile with each other. This article explores what happens to the theoretical logic of the opportunity cost mechanism when states are given the option to fight and trade. Rather than assume away this possibility, the theory must explain why it does not occur. This exercise reveals a set of related problems with the logic of the opportunity cost mechanism; then examines possible ways to remedy them. It brings to light a new variable – the costs of trading during war – that has received little attention but is essential for the opportunity cost mechanism. It derives the two surprising and perhaps improbable conditions necessary for the opportunity cost mechanism to be tenable. It shows that these conditions are only likely to be met if the theory is heavily modified to an extent that changes how the field thinks about the relationship between war and trade.

Introduction

The hypothesis that trade causes peace is among the most venerated theoretical claims in International Relations. The most prevalent reason given is the opportunity cost mechanism: states decide against war in order to continue trading with would-be adversaries.[1] In other

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[1] (Anderton & Carter, 2001a; Anderton & Carter, 2001b; Aydin, 2008; Barbieri, 1996; Barbieri, 2002; Barbieri & Levy, 1999; Barbieri & Levy, 2001; Barbieri & Peters, 2003; Barbieri & Schneider, 1999; Bearce & Fisher, 2002; Bearce & Omori, 2005; Benson & Niou, 2007; Chan,

words, the opportunity costs of forgoing trade during war cause peace. But, if states value trade so much, why would states choose not to trade while they fight? In taking the impossibility of trade during war for granted, the literature on the opportunity cost mechanism has overlooked perhaps the gravest challenge to it.[2] This article tries to square two assumptions of the opportunity cost mechanism, namely a) that trade is greatly valued by states and b) that states do not trade during war. Although each assumption is plausible on its own, the two are surprisingly difficult to reconcile with each other.

Embargoing trade during war is a policy choice, not an inherent consequence of war. If the option – not the reality, but just the option – to trade during war is added to the existing theory without any further changes, the opportunity cost incentive vanishes. For the opportunity cost mechanism to have logical coherence, a new variable that is largely absent from the literature is necessary: the costs of trading during war. These are reasons why trade is less valuable in wartime or why trading with an adversary imposes costs that do not apply to trade between adversaries on the brink of war. Even after introducing this variable to salvage the opportunity cost mechanism, I show that the theory is subject to two as yet unrecognized

2009; Copeland, 1996; Dorussen, 1999; Dorussen, 2002; Dorussen, 2006; Fordham, 2007; Gartzke, 2003; Gartzke & Li, 2003; Gartzke & Lupu, 2012; Gasiorowski, 1986; Gasiorowski & Polachek, 1982; Goenner, 2010; Hegre, 2000; Hegre, 2002; Hegre et al., 2010; Keshk et al., 2004; Kim & Rousseau, 2005; Krustev, 2006; Levy, 2003; Levy & Barbieri, 2004; Li & Reuveny, 2011; Mansfield & Pollins, 2001; Maoz, 2009; Martin et al., 2008; Morrow, 1999; Mousseau et al., 2003; Oneal, 2003; Oneal & Russett, 1997; Oneal & Russett, 1999a; Oneal & Russett, 1999b; Oneal & Russett, 2001; Oneal & Russett, 2005; Oneal et al., 1996; Oneal et al., 2003; Polachek, 1980; Polachek, 1997; Polachek, 2003; Polachek & Xiang, 2010; Polachek et al., 1999; Reuveny, 2001; Reuveny & Kang, 1996; Reuveny & Kang, 1998; Ripsman & Blanchard, 2003; Robst et al., 2007; Schneider & Schulze, 2003; Schneider et al., 2003; Stein, 2003; Xiang et al., 2007). All articles listed directly develop the opportunity cost mechanism, extensively discuss it, or make use of it as the basis for an empirical analysis. This is not a list of all research on trade and conflict, although it includes a considerable proportion of that research.
[2] Three notable exceptions are Levy (2003), Levy & Barbieri (2004), and Barbieri & Levy (1999).

constraints that limit its explanatory power and, perhaps, its plausibility. The central issue behind these is the need to explain the rarity of trade during war while still assuming that trade is valuable enough to states that it would induce them to choose peace when they would otherwise choose war.

This critique of the opportunity cost mechanism diverges from – and, in fact, directly contradicts – the major existing challenge to its logic, as put forward by Jack Levy and Katherine Barbieri. Levy and Barbieri show that belligerents in certain wars have continued to trade. They then argue that there cannot be an opportunity cost of forgoing trade if trade is not forgone.[3] Although this reasoning seems self-evident, I explain why it is not correct. There are serious holes to be filled in the logic of the opportunity cost mechanism as presently constructed, but this is not among them.

This article proceeds deductively through a step-by-step exposition of the logic of the opportunity cost mechanism. The objective is not to comprehensively analyze the relationship between war and trade, but rather to develop and repair the logic opportunity cost mechanism, starting from its core assumptions. Similarly, the intent of the article is not to explain whether wartime trade occurs, but rather to clarify the implications that giving states the option to fight and trade has for this theory.

I begin by reviewing the literature on peace and trade to establish the role of the opportunity cost mechanism therein. I then derive the window of cases in which trade causes peace through the opportunity cost mechanism and show how opening up the option to trade and fight eliminates this window if no other changes are made. I next introduce the costs of trading during war and the two additional constraints on the opportunity cost mechanism that emerge

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[3] Levy (2003), Levy & Barbieri (2004), and Barbieri & Levy (1999).

from the inclusion of this variable. This leads to an assessment of the size and nature of the costs of trading during war geared towards the question of whether they can be large enough to meet these two conditions.

This exercise leads to three plausible conclusions, each of which resolves the contradiction between the value of trade and the rarity of wartime trade in its own way. First, and most simply, trade with would-be adversaries may not be as valuable to states as the theory assumes. Second, a powerful but currently unstudied social norm against wartime trade could underlie the opportunity cost mechanism by providing a constraint against wartime trade. Third, relative gains concerns may become elevated in wartime, making wartime trade more costly than peacetime trade. However, as I will explain, the potential of this third explanation is more circumscribed than it may seem. In none of these three cases does the opportunity cost mechanism retain both its liberal-rational essence and its explanatory power. If it does in fact provide a significant impediment to war, it does so due in large part to a constructivist or realist motive.

Literature review

The International Relations literature contains four primary causal mechanisms through which trade is thought to cause peace: 1) the opportunity cost mechanism, 2) by empowering pro-peace interest groups, 3) by enabling costly signaling, and 4) by increasing the frequency of transnational social interactions so as to promote transparency and/or a sense of community.

Below I review these theories with a focus on the theoretical side of the trade-conflict question, rather than its more extensive empirical counterpart.[4]

First, the most prevalent of the four mechanisms is the opportunity cost mechanism. The idea is elegant in its simplicity; governments choose peace over war in order to continue reaping the benefits of trade.[5] The opportunity costs of forgoing trade during war cause peace. In what is often considered the first definitive statement of the opportunity cost mechanism, Polachek (1980) makes explicit the pivotal assumption that conflict reduces or eliminates trade:

> Conflict is assumed to affect the terms of trade. Specifically, greater levels of conflict make trade more difficult. Reasons include retaliatory tariffs, quotas, embargoes, and other trade prohibitions.

Anderton & Carter (2001: 445) similarly state that a fundamental assumption of the hypothesis that trade promotes peace is that 'serious conflict among societies disrupts trade.' Yet in Polachek's list, all of the factors that inhibit trade are voluntary actions taken by states; none are inevitable consequences of war. Dorussen (1999: 453) shows that trade's pacifying effect depends in part on the ability to commit not to trade after wars, which increases opportunity costs. Due to trade's value, this commitment is not easy to make credible. A similar problem exists during war. It is insufficient to simply assume trade ceases during war. To be plausible, the theory must explain why this happens despite the value of trade.

Do states trade during wars? This is an empirical question in need of further study, but the existing evidence seems to support the conclusions that 1) war greatly disrupts trade (Glick & Taylor, 2010), 2) large-scale trade during war is uncommon (Anderton & Carter, 2001), but 3)

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[4] For reviews of this empirical literature, see Barbieri & Schneider (1999); Mansfield & Pollins (2001); McMillan (1997).
[5] For references, see first footnote.

there are noteworthy cases of trade between belligerents continuing during war (Barbieri & Levy, 1999). Some wartime trade takes the form of smuggling, at times with tacit government approval, while in other cases governments have openly approved and even facilitated such trade. In the War of 1812, for example, it was initially the policy of the United States to permit trade with the Britain even to the extent of supplying food to the Royal Army. Thomas Jefferson wrote to President James Madison that the American people would be more likely to support the war if they could continue to reap the benefits of trading with Britain, no small concern given the strong opposition to the war in New England (Bickham, 2012: 94). Levy & Barbieri (2004) survey a variety of cases of wartime trade, including the War of the Spanish Armada, the War of the League of Augsburg, the Seven Years War, the War of 1812, the Crimean War, the American Civil War, and the 1992-1995 Bosnian War (also see Andreas, 2004). They provide a set of hypotheses to explain variation in wartime trade, emphasizing most of all that trade during war is more common when state capacity to control it is inadequate.

Second, another mechanism through which trade may cause peace is that the opportunity to profit from trade creates and/or strengthens domestic interest groups that favor both trade and peace (Mansfield & Pollins, 2001: 836; McDonald, 2004; Oneal & Russett, 1997: 268; Mastanduno, 2003). Trade provides these exporters with an incentive to lobby for harmonious relations. Over time, the profits from this trade can empower and entrench these groups, giving them added leverage to maintain the peace. The assumption again is that war necessarily disrupts trade.   In that sense, this mechanism is susceptible to the same questions that I raise for the opportunity cost mechanism.

Third, trade may increase the ability of states on the brink of war to send informative costly signals and thereby reduce the chances of war due to miscalculation (Morrow, 1999;

Gartzke et al., 2001). These signals take the form of economic sanctions and embargoes, with the hope that the cost to the sanctioner is sufficient to convince the target that only a highly resolute actor would be willing to endure those costs.[6] Morrow (1999) goes farther, arguing that the incentive to trade merely increases the amount that the state threatening war can demand to avoid it, and therefore trade does not affect the probability of war except by enabling signaling.

Fourth, trade can cause peace because it increases transnational interpersonal interactions (Barbieri & Schneider, 1999: 388-389; Dorussen & Ward, 2010; Oneal & Russett, 1997: 270). This could happen because trade provides information that averts dangerous misperceptions or for reasons more in line with Constructivism. For instance, trade might bring with it increased social interaction that fosters a sense of commonality and esteem. Reed (2003) develops a model in which economic interdependence makes peace more likely by reducing uncertainty. Deutsch et al. (1957) consider various types of cross-border social interactions as causes of stable peace in the form of security communities.

A variety of theoretical criticisms have taken aim at the broad claim that trade causes peace. Most emanate in one way or another from the Realist paradigm, sometimes as explicit challenges to the Liberal paradigm. Perhaps the most widely held objection is that trade is not important enough to states for it to be able to override the security considerations guiding decisions about war and peace (Barbieri, 1996: 33; Barbieri & Schneider, 1999: 388). At times this viewpoint takes the form of claims that the observed correlation between trade and peace exists because 'trade follows the flag'; that is, close relations cause trade rather than trade causing close relations (Gowa & Mansfield, 1993). A more recent reason for skepticism takes the

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[6] Somewhat less clear is why trade offers a superior means to do this than that which always exists: a limited use of force. Alternatively, it may be problematic that trade sanctions can be perceived as a signal of the unwillingness to use force (low resolve) rather than as a signal of high resolve.

view that the consequences of losing trade with one partner are often greatly ameliorated by states' ability to substitute another. Although some loss is surely involved, the costs of switching to a second-best market may often be a shadow of the costs of losing the trade entirely (Martin et al., 2008; Gholz & Press, 2001). Consequently, trade with one potential adversary may be of insufficient importance to cause peace.

Barbieri (1996) has gone farther and argued that economic interdependence, when it takes the form of asymmetric dependence, can create insecurity for states and cause wars aimed at reducing their dependence on the caprices of a vital trading partner.[7] Japan's fears of economic strangulation and the role of the oil embargo imposed by the United States in 1941 in leading Japan to start the war seem to offer an example. Although usually cast as an empirical debate with the plurality of studies arguing in favor of the proposition that trade causes peace (e.g., Oneal & Russett, 1997), Barbieri also extends earlier arguments about the perils of economic dependency to the theoretical claim that such tensions can cause wars.

Finally, the relative gains critique of the claim that trade causes peace holds that states prioritize which side profits more from trade (and consequently gains in relative power) over the absolute size of their own profits (Grieco, 1990; Mastanduno, 1991). If relative gains take precedence over absolute gains, trade is much less likely to have a pacifying effect and the opportunity cost mechanism would no longer hold. However, the relative gains critique tends to break down if more than two actors are present (Snidal, 1991a; Snidal, 1991b; Liberman, 1996). Receiving less than a trading partner from a mutually profitable trade may represent a setback relative to that partner, but it is a still a gain relative to every other state in the system. Morrow

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[7] However, Gartzke & Li (2003) argue that Barbieri's measure of dependence is in part a measure of global economic isolation, because having few trading partners leads to large shares of trade (dependence) on a few. It may be that these economically isolated states tend to be politically isolated and war-prone as well, with the causal arrows unclear.

(1997) contributes a separate critique in the form of a model showing that it is difficult for relative gains fears to outweigh absolute gains because states will likely spend a large fraction of their gains from trade in non-military areas.[8] As Morrow notes, however, this logic may well not apply during wars when military spending can increase greatly as a share of GDP. Although relative gains reappear in the analysis below, I will explain why the gravest conceptual challenges to the opportunity cost mechanism hold under the traditional Liberal assumption that states prioritize the absolute gains from trade.

The logic of the opportunity cost mechanism

An examination of the options available to states facing decisions about war and trade reveals the problem that the possibility of trading during war creates for the opportunity cost mechanism. In this section, I set up and walk through the logic of the opportunity cost mechanism in order to derive the window of cases in which trade causes peace through this mechanism – a window that changes immediately upon the introduction of the option to trade and fight.

I adopt the approach of mirroring the existing literature's theoretical discussion of the opportunity cost mechanism as closely as possible, with the eventual additions only of the option to trade during war and costs incumbent in doing so. This approach best highlights the effects of these additions. An alternative approach that involves creating and then modifying a more sophisticated version of the opportunity cost mechanism would inevitably raise questions of whether the added sophistication factors into my conclusions.

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[8] Morrow's article is also notable and unusual because it allows for the possibility of trade during war when it is in the interests of the involved parties. However, the article focuses on relative gains and is not oriented as a critique of the opportunity cost mechanism.

The result is an extremely parsimonious decision-theoretic model that is better regarded as an exercise in theoretical logic than an exercise in formal modeling. Although it is straightforward to inject the new elements in this simple model into more sophisticated game-theoretic models, I found that this added complexity tended to obscure the new elements and their implications. Therefore, I err on the side of parsimony and leave that undertaking to future research. In consequence, I focus on the incentives facing each actor in isolation. Like the existing literature's discussion of the opportunity cost mechanism, I assume complete information and treat states as unitary actors. This means retaining the focus on national interests rather than firms' interests, despite the fact that it is firms that conduct trade. Future research may wish to explore whether more complex models can generate deviations from my conclusions by incorporating strategic interaction, bargaining, multiple rounds of interaction, uncertainty due to private information, a domestic political level of analysis featuring competing interest groups, etc.[9]

I start by defining the variables and outcomes. All are at the directed-dyad level. The benefits of trade (T), therefore, refer only to the benefits for one state of trading with one specific would-be adversary. The costs of trading during war (C_{TW}) are underlined because they are introduced in a later section. I first consider the merits of the opportunity cost mechanism without those costs, in keeping with their absence in the current literature. This affects the payoff for the outcome of war with trade. Note that by allowing the expected utility of war (W) to be positive, I am not assuming states derive any intrinsic utility from fighting a war, but rather merely that states may sometimes prefer war to peace based on all non-trade considerations.

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[9] For instance, including both of the two states on the brink of war would seem to make it easier for war to occur without trade, because only one of the two states must prefer an embargo to trade in order for trade to cease. However, allowing for the two states to negotiate and optimize the terms of trade to make trade beneficial for both sides might negate much or all of this effect.

Variables

W   *Expected Utility from War*

P   *Expected Utility from Peace*

T   *Benefits from Trade*

C_{TW} *Costs of Trading during War*

Outcomes	*Payoffs*
Peace with No Trade	P
Peace with Trade	$P + T$
War with No Trade	W
War with Trade	$W + T - \underline{C_{TW}}$

With no modifications, the opportunity cost mechanism causes peace under two conditions: 1) Peace with trade must be preferable to war without trade. 2) War without trade must be preferable to peace without trade. This second condition is necessary for trade to shift the outcome from war to peace; without it peace would happen regardless of any trade considerations. These two conditions are reproduced below:

$$W < P + T \quad (1)$$

$$W > P \quad (2)$$

These conditions can be combined into a window of cases in which trade causes peace. This window should be thought of in terms of how much war can be preferred to peace such that trade still causes peace. When war is too strongly preferred to peace, the benefits of trade are insufficient to cause peace. When war is not preferred to peace at all, trade makes no difference for the outcome. The window falls in between. A wide window would imply that trade often causes peace. The inequalities make clear that the potency of trade as a cause of peace depends mainly on how much trade is valued, as one would expect.

$$P < W < P + T \qquad (3)$$

Simplifies to: $\qquad 0 < W - P < T \qquad (4)$

This window (above) is the standard theory of when and why the opportunity costs of forgone trade cause peace. It is quite plausible. It relies, however, on the implicit and implausible assumption that states do not have the option to fight and trade.

The option to fight and trade

Relaxing this assumption through the addition of the option to trade during war produces starkly different conclusions. Without introducing the costs of trading during war, this difference is particularly striking. Assuming trade is at least slightly beneficial $(T > 0)$, war with trade is always preferable to war without trade. Similarly, peace with trade is always preferable to peace without trade. Consequently, the two strictly dominated options will never be selected. The decision reduces to a choice between war with trade and peace with trade. War will then ensue if war with trade is preferable to peace with trade, as shown below.

$$W + T > P + T \qquad (5)$$

Simplifies to: $\qquad W > P \qquad\qquad (6)$

Because the benefits of trade are obtained regardless of the decision between war and peace, trade cancels out of the decision calculus altogether. Without costs of trading during war, introducing the option to trade and fight – an option that states do possess – causes the opportunity cost mechanism to fall apart entirely. This problem is the reason why the logic of the opportunity cost mechanism is under-developed at present. In the next section, I explore whether introducing costs from trading during war can rescue the theory.

Can the costs of trading during war save the opportunity cost mechanism?

The window of cases in which trade is expected to cause peace depends not just on the size of the benefits of trade, but also on the size of the costs of trading during war. This section explains the necessity of that added constraint by developing the logic of the opportunity cost mechanism to incorporate the costs of trading during war. This new variable has the effect of allowing peacetime trade to be more valuable than wartime trade.

What are these costs of trading during war? How large are they? I revisit these questions in more detail in a later section, but a definition is useful here. The costs of trading during war are costs that do not exist when trading during peace or when fighting a war without trade. These costs, by definition, exist only in the joint condition of trade and war. They can be thought of as both the reduced value of trade due to war and the reduced value of war due to trade (e.g., if trade reduces the probability of victory). The costs of trading during war include

only the costs directly from forgone trade with the adversary. They do not extend to the many other types of economic costs suffered during wars. Within those bounds, this variable is something of an umbrella encompassing several forms of costs. I have identified three main types. First are logistical costs such as the expenses incurred in bypassing active battlefields or shipping goods through neutral states, including transportation costs and insurance premiums. Second are strategic costs taking the form of relative gains concerns, i.e., the fear that the adversary will gain more from trade and so gain a military advantage. Third are normative costs deriving from a strong norm against trading with the enemy, provided that such a norm exists. I evaluate these in more detail in a later section, but present purposes it suffices to treat the costs of trading during war as an umbrella term.

For trade to cause peace, peace with trade must be preferable to war with trade, as shown below. Without costs of trading during war, this was only possible when peace was preferable to war, in which case trade was making no difference. Introducing the costs of trading during war allows peace with trade to be preferable to war with trade even when war without trade is preferable to peace without trade. Including these costs therefore reopens the possibility that the opportunity cost mechanism can be sustained for a window of cases. As shown below, the result is a new condition limiting this window of cases in which trade causes peace.

$$P + T > W + T - C_{TW} \qquad (7)$$

Simplifies to: $\qquad P > W - C_{TW} \qquad (8)$

Rearranges to: $\qquad C_{TW} > W - P \qquad (9)$

The previous section explained the logic behind two other conditions: 1) peace with trade is preferable to war without trade and 2) war without trade is preferable to peace without trade. Combining both with the new condition that peace with trade must be preferable to war with trade, trade causes peace if all three of the following conditions are met:

$$W - P > 0 \qquad (10)$$

$$W - P < T \qquad (11)$$

$$W - P < C_{TW} \qquad (12)$$

For the opportunity costs of forgone trade to cause peace, a state must prefer war to peace, but this difference must be less than the value of the trade *and the costs of trading in war,* whichever is lower. This is a new limiting condition. If the costs of trading during war are low, trade should rarely cause peace. Hypothetically, if these costs were zero, trade would never cause peace through the opportunity cost mechanism.

In itself, this set of constraints would seem to offer reprieve to the opportunity cost mechanism in that the resultant window of cases could still be quite significant despite the added constraint. However, the inclusion of the costs of trading during war brings to light another challenge for the opportunity cost mechanism.

Why not fight and trade?

Perhaps the gravest challenge for the opportunity cost mechanism is that if trade is so valuable that it can cause peace, states that choose to fight wars would follow their incentives and choose to trade during them. Trade would continue during most wars, but it normally does

not, or at least not at anything approaching peacetime levels (as discussed previously). Explaining the rarity of trade during war is necessary for the opportunity cost mechanism to be plausible, but it is no small challenge due to the assumption that trade is so valuable to states that it leads them to choose peace over war.[10] For the opportunity cost mechanism to be able to cause peace while also explaining the rarity of trade during war, yet another constraint comes into play.

Before formalizing this constraint, it is important to note that the puzzle of the rarity of wartime trade despite the value of trade is at odds with arguments by Levy and Barbieri that the presence of wartime trade would undercut the opportunity cost mechanism. In their view, the existence of trade during war undermines the opportunity cost mechanism because there can be no opportunity cost from forgone trade if trade is not forgone (Levy, 2003; Levy & Barbieri, 2004; Barbieri & Levy, 1999: 465). Perhaps counter-intuitively, however, the rarity of trade during war – not the presence of wartime trade – raises greater doubts about the opportunity cost mechanism.

Suppose, as seems reasonable, that the costs of trading during war reduce the value of wartime trade relative to peacetime trade, but wartime trade still retains some positive value. When states value avoiding this reduction in trade more than they value going to war, peace with trade would result. When states value going to war more than the reduction in the value of trade caused by it, they would go to war. Crucially, however, they would go to war while continuing

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[10] The question of why states forgo trade during war despite the costs of doing so parallels the rationalist war puzzle (Fearon, 1995), which asks why states go to war at all given the costs of doing so. The same question can also be asked about why wars escalate from limited war towards total war, and the cessation of trade can be thought of as one element of that escalation. One can argue along these lines that mutually costly escalation consistently happens despite its costs as states punish and pressure each other, so the lack of wartime trade should not be surprising. Yet, peace is common, as is limited war. So then, why is wartime trade so rare? The analogy between wartime embargoes and escalation is apt in many ways, but it does not seem to be able to explain why the default policy of belligerents is to prohibit trade.

to trade in order to reap as much of its benefits as is possible in wartime. War with trade at its reduced level of value would still be preferable to war without trade. Under these conditions, two outcomes would each occur some of the time: peace with trade and war with trade at reduced levels. Far from undermining the opportunity cost mechanism, the existence of trade at reduced levels during wars is exactly what one would expect to see if the mechanism is causing peace in many other cases. The two are natural complements. Put another way, the opportunity costs of the reduced value of trade during war would be able to cause peace even if the continuation of trade during war were ubiquitous. More formally, whether war or peace occurs depends on whether the preference for war over peace is larger or smaller than the costs of trading during war (see below).

Peace with trade if: $\quad 0 < W - P < C_{TW} < T \qquad$ (13)

War with trade if: $\qquad 0 < C_{TW} < W - P < T \qquad$ (14)

The opportunity cost mechanism – ever after being resuscitated by the inclusion of the costs of trading during war – still implies that trade should continue during wars. The underlying puzzle remains unsolved: if something is valuable, why forgo it? The previous section derived the constraints on the opportunity cost mechanism irrespective of this question of whether trade occurs during war.

The final constraint on the opportunity cost mechanism arises from the need to explain the rarity of wartime trade. For states to embargo trade during war, war without trade must be preferable to war with trade. States would only choose war without trade over war with trade if the costs of trading during war exceed the value of the trade:

$$W > W + T - C_{TW} \qquad (15)$$

Simplifies to: $\qquad C_{TW} > T \qquad (16)$

This is a surprising requirement. To explain the historical regularity of wars without trade, the costs of trading during war must usually exceed the benefits of trade. If trade is so valuable that it is able to prevent wars, how plausible is it that this condition is met? The opportunity cost mechanism can cause peace without falsely predicting that trade generally continues during war under the following conditions, and only under these conditions:

$$0 < W - P < T < C_{TW} \qquad (17)$$

In the next section, I take up this question of how large the costs of trading during war are likely to be. In particular, I consider whether and how they can be greater than the benefits of trade. This requirement becomes increasingly difficult to sustain for increasingly high valuations of trade; it is most easily met if trade is less valuable to states than is sometimes assumed. Because the strength of the opportunity cost mechanism is bounded by the benefits of trade, this would call the explanatory power of the theory into question.

How large are the costs of trading during war?

The viability of the opportunity cost mechanism depends on the magnitude of the costs of trading during war. The two previous sections showed the two distinct ways in which this is true and explained why the costs of trading during war must generally exceed the benefits of trade for

the theory to be sustained. Building on the division of these costs into logistical costs, strategic costs, and normative costs, this section examines whether each can lead the costs of trading during war to be so large that they exceed the benefits of trade. The question is not whether these costs exist – they do to some extent – but whether they exceed the benefits of trade.

First, it is more costly and risky to conduct trade with an enemy during a war, in large part due to the need to traverse or bypass active battlefields (Anderton & Carter, 2001: fn. 2). These logistical costs seem to align best with the ostensibly liberal nature of the opportunity cost mechanism. However, although these costs surely do exist, it is a logical impossibility for the logistical costs of trading during war to be greater than the benefits of trade, which is the issue at hand. For any single transaction, if the logistical costs of completing the transaction would exceed the benefits, the firm declines to make the trade. Consequently, those logistical costs are not borne. Because unprofitable transactions are not made, for any given transaction the logistical costs can at most equal the value of trade, meaning it removes all of the value of that transaction to the state. Therefore, even if the logistical costs were so severe that they stopped all trade, they would only equal the benefits of trade, not exceed them. More likely, trade in certain goods will remain profitable despite increased transaction costs from war, as the long history of wartime smuggling suggests. If so, the logistical costs of trade during war are limited to a fraction of the benefits of trade.

Below I express these claims more formally. Recall that T denotes the overall value of trade. The other parameters are as follows:

K *The number of transactions*

V_i *The value of each transaction*

C_{Li} *The logistical costs of each transaction*

C_L *The overall logistical costs*

$$T - C_L = \sum_{i=1}^{K} [V_i - C_{Li}] \qquad (18)$$

However, because unprofitable transactions will not occur, these transactions must be set equal to zero:

$$T - C_L = \left\{ \sum_{i=1}^{K} [V_i - C_{Li}] \Big| [V_i - C_{Li} > 0] \right\} + \left\{ 0 * \sum_{i=1}^{K} [V_i - C_{Li}] \Big| [V_i - C_{Li} \leq 0] \right\} \qquad (19)$$

This simplifies to the following:

$$C_L = T - \left\{ \sum_{i=1}^{K} [V_i - C_{Li}] \Big| [V_i - C_{Li} > 0] \right\} \qquad (20)$$

This result shows that the logistical costs can at most equal (and never exceed) the value of trade. It is much more likely that the logistical costs will be limited to a fraction of the value of trade, given the existence of trade in highly lucrative and easily transportable luxury goods.

Moreover, although the logistics of trading are more challenging in wartime, logistical costs can be minimized through readily available policy choices. Governments seeking the benefits of trade would have a strong incentive to take such actions. One common means for trading during a war is to route the trade through a neutral third party, or to carry it on a ship under the flag of a third party. Even in World War I, for instance, illicit trade circumventing the

British blockade of Germany was often possible via Denmark, the Netherlands, and Switzerland, among others. At one point in the war, the British government approached the Germans looking to purchase binoculars and gun-sights, because the German optics industry was the world's finest. The Germans agreed in exchange for rubber, another critical military commodity cut off by the British blockade, and the trade was conducted at the Swiss border (Hochschild, 2011: 161). Safe zones can also be arranged for the purpose of conducting trade. Although trade during war has been the exception more than the rule, states have been able to trade in war when they both wished to do so. The prevalence of smuggling and illicit trade between belligerents in some eras despite policing efforts also suggests the potential for still greater levels of profitable trade if the two sides actively try to maintain trade rather than to suppress it. The logistical costs of trade during war are part of a larger explanation for the rarity of wartime trade. But they cannot be the answer in themselves, and states would often be able to make arrangements to facilitate wartime trade if they wished to do so, thereby minimizing the logistical costs.

Second, strategic costs in the form of relative-gains concerns offer another candidate explanation for the rarity of wartime trade. These costs may well remain even assuming that states looking to continue receiving the absolute gains of trade can and would negotiate to balance the relative gains. There would be a certain irony if a Realist relative-gains constraint on wartime trade was in fact the basis for this ostensibly Liberal theory about how the absolute gains from trade cause peace. Levy (2003: fn. 19) makes this point clearly:

> Liberals *assume* that dyadic trade drops significantly with the onset of war between trading partners but usually are not explicit about *why* this occurs. If trade between adversaries stops primarily because state leaders prohibit or fear that the adversary will reap a disproportionate share of gains from trade and convert those gains into military power (the realist relative-gains argument), the distinctively 'liberal' character of the liberal economic theory of war comes into question. Arguments based on the impact of

increased transportation and insurance costs on incentives to trade would be more consistent with fundamental liberal assumptions.

The scope for these strategic costs is considerably smaller than it might appear. Intuitively, it seems reasonable that if relative gains concerns are so strong as to overwhelm the absolute gains from trade, the potency of a theory of peace predicated on those absolute gains must be called into question. In the terms used in this article, the critical distinction is between the strategic costs of trading with a rival in peacetime and the additional strategic costs of trading with that adversary once the war starts. This distinction is important in two ways. First, only the latter qualify as costs of trading during war. This is not so problematic in itself, because it is reasonable to expect that relative gains concerns reach their peak during wars (Barbieri & Levy, 1999: 464). This is likely despite the fact that the comparison is not between war and peace generally, but rather between war and the tensest peacetime moments in which war would occur if not for the desire to continue trading.

More importantly, if wartime relative gains concerns are so acute, it stands to reason that relative gains for states on the cusp of a potential war also weigh heavily against the absolute gains of trade. This would mean the value of trade to states on the brink of war is greatly reduced, matching the intuition that the prioritization of relative gains over absolute gains compromises a theory premised on the idea that states pursue the absolute gains from trade. In other words, the greater the strategic costs of trading during war are, the smaller the benefits from trade on the brink of war are likely to be. If the benefits from trade are low, the opportunity cost mechanism has low explanatory power per the first constraint identified above.

Third, there may be a powerful norm against trading with the enemy in wartime. Treason, after all, is often defined as 'giving aid and comfort to the enemy.' The norm might

influence leaders directly, or indirectly if the norm affects the behavior of voters or power-brokers who could punish leaders for violating it. Pollins (1989) implies such a norm in arguing that consumers eschew purchasing imports from hostile nations based on a principled opposition to that state's policies and/or solidarity with their own government's foreign policy. Yet, there has been almost no research directly on this norm against wartime trade to my knowledge, save for a brief discussion in Levy and Barbieri (2004: 33). If this single norm that has received scant academic interest is in fact so powerful that it routinely overcomes the benefits of trade, it might call into question the explanatory power of liberal-rational opportunity cost mechanism in a manner reminiscent of the relative gains explanation. If this norm is so powerful weighed against economic incentives, perhaps social norms trump such rational-economic incentives in general?

Normative costs as the main explanation for the rarity of wartime trade would result in the irony of this theory seemingly premised on Liberal economic incentives in fact relying on a Constructivist normative constraint on state behavior. Constructivists might reasonably object to conceiving of a norm against wartime trade as a cost in a larger cost-benefit calculation. Regardless of its conceptual nature, however, a normative constraint on wartime trade could undergird the opportunity cost mechanism if it is strong enough to overcome the benefits of trade.

If trade in war is in fact rare, as the preponderance of evidence indicates, then some combination of these three types of costs presumably explains why.[11] Because logistical costs are inherently limited to explaining only a fraction of why the costs of trade during war exceed the benefits of trade, the burden falls primarily on a norm against wartime trade or relative gains

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[11] I say 'presumably' because it is impossible to deductively prove the absence of another type of cost that I have neglected to consider.

concerns in war that greatly exceed relative gains concerns between rivals on the brink of war. Neither explanation is impossible in a world where trade is extremely valuable to states. Perhaps one or both of these factors is so potent as to cause the rarity of wartime trade despite states tending to value trade among their foremost national interests. This conclusion leaves some latitude for the opportunity cost mechanism to operate, although the logic and rationale behind the mechanism have changed.

The alternative conclusion to draw is that, although these three forms of costs of trading during war do exist, they only offer a strong explanation for the rarity of wartime trade if the benefits of trade are low. If the benefits of trade are too low to regularly cause peace, then it is much easier to explain how a norm that has received little attention could so consistently take precedence over the economic incentive to continue trading in wartime. Similarly, relative gains concerns may explain the rarity of wartime trade, but they do so in a way that calls into question this notion of how highly states value the absolute gains from trade. In short, there is no truly satisfying Liberal basis for the costs of trading during war, and the non-Liberal explanations tend to call into question whether states value trade enough for the opportunity cost mechanism to prevent wars.

Conclusion

Allowing for the fact that states have the option to trade and fight should they wish to do so calls into question the logic of the opportunity cost mechanism, the main reason trade is thought to cause peace. The opportunity cost mechanism's twin assumptions – that states do not trade in war and that trade is so valuable to states that they would choose it over war – are at

odds with one another. The challenge for the theory is reconciling them, and this article examined whether doing so is possible.

The article explains why this well-established and widely-used theory requires to be tenable a critical new variable (the costs of trading during war), two unrecognized constraining conditions that curtail its explanatory power, and necessary additions to the theoretical logic. Even in the most favorable interpretation for it, the liberal-rational opportunity cost mechanism may depend on some combination of *realpolitik* relative gains fears and/or a social norm against wartime trade. Either possibility poses no small amount of irony from the standpoint of the longstanding paradigmatic clashes in International Relations. More importantly, either possibility changes how the field understands the trade-conflict relationship and, in particular the question of when trade should be expected to cause peace through the opportunity cost mechanism.

There is a great need for new research on the prevalence of wartime trade and, most of all, on the costs of wartime trade. There are many questions still to be answered. Empirically, how costly is trading during war? Which costs are the most powerful? How do they vary? Is there a powerful global norm against wartime trade? How strong is it? When and why do states perceive wartime trade as strongly favoring one side over the other? How difficult is it logistically to conduct trade during war when belligerents choose to do so? There is no shortage of avenues through which future research can expand the field's understanding of the opportunity cost mechanism and the broader relationship between conflict and trade.

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