An Economic Theory of Hegemonic War*

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Abstract

What are the economic causes of hegemonic wars? When does economic interdependence lead to war? We argue that, given its dominant influence on the international political economy, an economic hegemon cannot commit to offer generous terms to weaker states. This may make an economically dependent challenger unable to maximize its economic growth given its available resources. When this inefficiency is large enough for the challenger to expect victory in conflict to result in faster economic growth, war is rational. War will happen when the challenger is neither so weak that its chances of victory are too small, nor so strong that it is able to extract better terms from the hegemon through a peaceful settlement. This mechanism applies regardless of (i) whether the two states are interdependent and (ii) whether the challenge is rising or declining vis-à-vis the hegemon, countering the long-held views that (a) economic interdependence dampens the odds of war and (b) only declining states have an incentive to declare war. We use our theory to provide a novel interpretation of the deep causes of World War II in Europe and the Pacific.

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1 Introduction

When can economic factors lead to hegemonic wars? Despite the large literature on the causes of hegemonic wars (Gilpin, 1981; Kugler and Lemke, 1996; Copeland, 2000a) and the economic sources of conflict (Keohane and Nye, 1977; Barbieri and Schneider, 1999; Mansfield and Pollins, 2001), we have no good account of the economic origins of hegemonic wars.

On the one hand, the canonical works in the power transition theory tradition (Organski, 1968; Organski and Kugler, 1980; Gilpin, 1981; Kugler and Organski, 1989) emphasize the challengers’ incentives to resort to war against an economic hegemon, but fail to incorporate Fearon (1995)’s insight that war is costly and therefore irrational when a peaceful bargain that leave neither state worse off is available. On the other hand, works that incorporate this insight (Fearon, 1995; Powell, 1999, 2006) allow for war only based on the preventive incentives of a decaying economic hegemon to fight in order to forestall further decline, ignoring that challengers too may have rational incentives to launch a conflict. Furthermore, both these strands of literature posit only the possibility of strong states going to war against weaker opponents. In power transition theory, the challenger only launches a war once it has become at least as powerful as the hegemon (Kugler and Lemke, 1996; Organski and Kugler, 1980). Among rationalist explanations for war, it is only a declining but still powerful hegemon that has incentives to fight (Powell, 2006).

This state of the literature presents both a theoretical and an empirical puzzle. Theoretically, if a state is sufficiently strong, its power should enable it to extract favorable terms in a peaceful settlement, obviating the need to resort to war. It is weaker challengers that are likely to be faced with unfavorable settlements imposed by an economic hegemon, giving them incentives to go to war. Empirically, many of the most important conflicts in history were launched by comparatively weaker states, including both aggressors in World War II – Germany and Japan – each of which possessed a fraction of their adversaries’ economic power. In sum, we need an account of how relative economic weakness might lead a state to launch a hegemonic war.
This paper introduces a novel framework for understanding the economic causes of hegemonic wars that allows us to solve these two puzzles. Our argument starts from a simple premise: countries differ in their economic power, and a hegemon has a greater influence than other countries in setting the terms of international economic engagement. Specifically, the hegemon can affect the division of the surplus generated by its economic interaction with other, weaker states. It also has the ability to regulate the cost other states have to pay to access foreign resources they need in order to grow. Combined, these two mechanisms may prevent weaker states from using their available resources in an optimal way, undermining their economic growth. For these states, war against the economic hegemon may be a rational option. A challenger faced with a constraining structure of the international economy will find war rational not depending on whether its relative power is rising or declining, but on whether war would bring about a more favorable international economic environment, thereby facilitating faster economic growth. Although war is costly and the challenger’s relative weakness make it less likely to win, victory would allow it to invest its available resources optimally, generating faster economic growth. Therefore, when the gain in economic efficiency brought by victory in war is sufficiently large to make the challenger’s expected outcome of fighting (despite its relatively low likelihood of winning) better than the continuation of peace, war will break out.

In contrast with the existing literature, our theory accounts for why any challenger – even one that is weaker and / or rising – may rationally launch a hegemonic war. As in the case of exogenous power shifts, war is caused by a commitment problem (Powell, 2006). This problem, however, stems not from a challenger’s inability to commit not to exploit its future power, but from the hegemon’s inability to commit not to exploit its dominant economic position. Furthermore, as we will see below, this economic mechanism for war is attenuated but not eliminated when the hegemon is also dependent on the challenger. In other words, our account of the economic origins of hegemonic wars is robust to situations of economic interdependence between the hegemon and the challenger.
In the second half of the paper, we use our theory to underpin a novel theoretical interpretation of the origins of World War II (WWII) in both Europe and the Pacific. Drawing on recent historiography, we establish a hitherto underappreciated deep cause of the conflict. Both Germany’s and Japan’s access to key resources for economic growth (capital and oil, respectively) were regulated by the United States. When factors exogenous to the interaction between the United States and these two challengers (the onset of the Great Depression in the case of U.S.-German relations and the Nazi invasion of the Soviet Union in the case of U.S.-Japanese relations) increased Washington’s valuation of these resources, U.S. policymakers limited Germany’s and Japan’s access to them, undermining their ability to grow peacefully. At a deep level, we argue, WWII was caused by structural conditions of the international economy that made it difficult for these two weaker states to grow efficiently, ultimately leading Berlin and Tokyo to launch armed challenges to the status quo.

The remainder of the paper proceeds as follows. The next section covers the existing literature on the economic causes of hegemonic wars and lays out our theory. Section 3 formalizes the theory through a game-theoretic model. Section 4 applies our theory to the cases of WWII in Europe and the Pacific. We conclude by offering general predictions on the likelihood of hegemonic wars and extracting policy implications for U.S.-China relations. Proofs of the formal results are in the Appendix [to be completed].

2 Literature and Theory

The classical literature on the causes of hegemonic wars focuses on power trajectories, analyzing how the relative rise or decline of a state’s relative economic power may lead it to launch a hegemonic war. As Organski and Kugler put it, the “source of war is to be found in the differences in size and rates of growth of the members of the international system” (Organski and Kugler, 1980, 20). For some authors in the power transition literature, war is rational for a declining hegemon (Copeland, 2000a). For others, war makes sense for a rising challenger once it has become at least roughly as powerful as its opponent (Organski,
In either case, war results from differential rates of economic growth. Still, neither of these arguments explains why states choose war rather than merely renegotiating the status quo peacefully, settling on a bargain that reflects their new relative economic power (Fearon, 1995).

More recently, a rationalist literature incorporating this insight has investigated the conditions under which peace between a hegemon and a challenger will break down. Like the informal literature that preceded it, these rationalist explanations for hegemonic war also focus on power trajectory (Fearon, 1995; Powell, 1999, 2006). When a rising challenger becomes more powerful relative to a declining hegemon, it has an incentive to renegotiate the international status quo in its favor. Anticipating this shift, the challenger is unable to commit to maintaining current bargains in the future. This commitment problem provides the declining hegemon with an incentive to strike preventively while the balance of power still favors it, giving it a better chance of prolonging a more beneficial status quo. When shifts in the balance of economic power are expected to be large and rapid, this mechanism can lead the declining hegemon to resort to war.¹

In a parallel debate, much has been written on the relationship between economic interdependence and conflict, with important implications for our understanding of the causes of hegemonic wars. According to the conventional wisdom, economic interdependence increases the opportunity cost of war, making it a force for peace (Polachek, 1980; Crescenzi, 2003; Martin, Mayer and Thoenig, 2008; Polachek and Xiang, 2010). While intuitive, this idea has been called into question using three different lines of reasoning.

¹More recently, scholars have developed a second mechanism connecting power shifts to war, this time focusing on endogenous shifts in military power. This argument builds on the observation that most large and rapid shifts in the balance of power are the result of militarization decisions, which should be treated as endogenous to state decisions (Debs and Monteiro, 2014). When a military investment that would result in a large power shift is not perfectly observable, war may ensue. In this case, a state that would face a sharp decline if another decides to invest in additional military power may decide to strike preventively even in the absence of conclusive evidence about the suspected investment. This mechanism can produce war only in the presence of uncertainty about military investments. For an empirical application to the realm of nuclear proliferation, see Monteiro and Debs (2013).
First, the opportunity-cost argument may gloss over some complex strategic effects in crises of resolve. As the opportunity cost of war increases, a given state may be less willing to declare war. Anticipating this effect, another state may be more willing to escalate a conflict. As a result, the net effect of interdependence on the likelihood of war may be indeterminate (Morrow, 1999; Gartzke, Li and Boehmer, 2001).

Second, as McDonald has pointed out, the pacifying effect of trade may depend not on its levels but on trade policy. To promote peace, trade must be free, i.e., it must result from policies that enhance interdependence and, in doing so, decrease the domestic power of pro-war groups, limit a government’s ability to build pro-war coalitions, and boost the influence of pro-trade groups in limiting aggressive foreign policies (McDonald, 2004, 2007, 2009, 2010). According to this line of reasoning, then, interdependence should reinforce peace only when it is the result of directed state policies such as deregulation, dismantling of barriers to trade and capital flows, etc.; rather than from advances in communication and transportation technology, which were, as McDonald shows, at the basis of the relatively interdependent pre-World War I [WWI] era (McDonald, 2004, 569).

Finally, Copeland criticizes the conventional wisdom on how interdependence reinforces peace – and connects interdependence with power shifts in producing conflict – by incorporating the role of expectations about future levels of trade into state’s decisions to cooperate or engage in military competition, in what he labels a “trade expectations theory” (Copeland, 1996, 1999/2000b, 2013). For Copeland, the state in a dyad that depends most on mutual trade is likely to launch a war when its expectations of future trade decrease. A state that is highly dependent on trade with another may worry that being “cut off” by its trading partner would result in its inevitable decline, leading it to strike preventively (Copeland, 2013, 38-55).

By looking at the consequences of states’ decisions rather than taking levels of economic interdependence and rates of economic growth as exogenously given, all these critics make important analytical moves. Still, none of these arguments is able to explain when interde-
dependence produces war rather than merely a different peaceful bargain.

In our view, this limitation of the literature stems in part from a limitation of the standard bargaining model. The standard rationalist framework assumes that states bargain over the division of an object with a value that is fixed and independent of their action (Fearon, 1995; Powell, 2006). This assumption may be appropriate for certain situations; for example when states negotiate over strategic assets, such as a territory or a weapons program (Debs and Monteiro, 2014). But the assumption of a fixed, exogenously determined object of dispute is not appropriate when states negotiate over the distribution of their aggregate wealth. States determine the value of their aggregate wealth by choosing their economic policy. The set of possible policies includes economic interaction through trade (of resources, finished products, and services) and capital flows, which may increase their aggregate wealth while also resulting in their interdependence. Understanding the effects of economic interdependence on peace would therefore require that we incorporate the effects of these policies into a rationalist theory of hegemonic war.

In sum, the existing literature on the economic causes of hegemonic war either ignores the insight that war is costly and therefore inefficient or it incorporates this insight but models economic growth in a relatively shallow way, focusing on the distributional problems that result from differential rates of growth, without capturing how economic interdependence may condition each state’s rate of economic growth.

As a result, all existing arguments about the economic causes of hegemonic wars focus on the incentives that a declining hegemon has to go to war in order to forestall further decay in its relative power. In the extant literature, no argument accounts for why a weaker, rising challenger may try to overturn the existing status quo by force. Yet, it seems intuitively plausible that war might be a rational option for a weaker, economically dependent state as long as its expected outcome would result in faster economic growth. Historically, weaker challenges have launched important wars, including WWII, which was started in both Europe and the Pacific by relatively weak states, namely, Germany and Japan. How, then, can we
explain a weaker challenger’s decision to launch a hegemonic war even when peace would likely allow for its power to rise further?

In our view, the key analytical move necessary to understand the economic causes of hegemonic wars is to shift our focus of attention from power trajectories – i.e., how the challenger’s power is evolving relative to the hegemon’s – to a comparison of the challenger’s expected outcome of peace and war. Whenever the economic inefficiency imposed on the challenger by the existing status quo is greater than the cost of war, conflict is likely to ensue regardless of the power trajectory of the challenger relative to the hegemon. In other words, whether the challenger is rising or declining vis-à-vis the hegemon has no impact on the likelihood of war. What determines whether conflict is likely is the magnitude of the economic inefficiency imposed on the challenger by the structure of the international economy regulated by the hegemon compared with the cost of war.

To investigate the economic causes of hegemonic wars from this perspective, we need a richer conceptualization of peace and, specifically, of economic interdependence. In addition to accounting for the distributional consequences of relative power in peacetime (i.e., how a more powerful state is able to extract more favorable terms in a peaceful bargain because it is more likely to win a war should conflict break out) an economic theory of hegemonic war must also account for how economic interdependence (and, in particular, the challenger’s dependence on the hegemon) constrains the efficiency with which the challenger can invest its resources in order to generate economic growth.

In this context, the right question to ask about the economic causes of hegemonic war is not (as the standard rationalist framework asks), why do states fail to achieve a peaceful bargain over a fixed, exogenously-determined amount of aggregate wealth? Rather, the right question to ask is (as we do), why do states fail to implement policies that would encourage economic efficiency and maximize aggregate wealth, and settle instead for policies that produce a level of economic inefficiency in peace that is so large as to make war rational? More concisely, how might the challenger’s economic dependence on the hegemon result in a
greater level of inefficiency in peace than if war breaks out?

An economic theory of hegemonic war must endogenize economic growth to capture how the challenger’s dependence on the hegemon limits its ability to produce growth. This step enables us to highlight a new mechanism connecting economic interdependence and hegemonic war. In the anarchic international environment, an economic hegemon faces a commitment problem: it cannot commit to offer favorable terms of economic interaction to weaker states. But if the hegemon appropriates a disproportionate share of the gains in its economic interactions with a challenger, the challenger will react by under-investing its available resources in tradable goods and services, thereby failing to maximize its own economic growth. An efficient allocation of resources to tradable goods and services could maximize the benefits of peace, but the weaker challenger might reap too small a share of these benefits to justify this investment. Consequently, when the basic structure of the international economy, as regulated by the hegemon, limits a challenger’s ability to maximize its own economic growth, the challenger may prefer to attempt to overturn the status quo by military means. By going to war, the challenger could gain (formal or informal) control over sufficient additional (input and output) markets that would enable it to invest its resources more efficiently and to bargain for a more favorable basic structure of the international economy. War, in this sense, solves the problems created for weaker states by the hegemon’s

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2We define dependence by saying that state C, a challenger, is dependent on state H, a hegemon, when H has the ability to set the cost of a resource that C needs in order to invest its own resources efficiently in generating economic growth. Interdependence obtains when this relationship is mutual, i.e., when C also has the ability to condition the cost of H’s investments in economic growth. For the remainder of this section and in section 3 below we focus on theorizing and modeling the effects of the challenger’s economic dependence on the hegemon. In the Appendix [to be completed] we introduce a model extension that shows how economic interdependence between the hegemon and the challenger narrows the range of cases in which war would be rational but does not extinguish it. In other words, although the hegemon’s economic dependence on the challenger decreases the likelihood of war, it does not eliminate the possibility of war breaking out for economic reasons resulting from the challenger’s own dependence on the hegemon.

3For a similar idea – the “hold up” problem – in the economics literature, which forms the basis of a rational theory of the firm, see, e.g.: Coase (1937); Klein, Crawford and Alchian (1978); Williamson (1985).

4This is not the first paper to assume that peace can be inefficient relative to war. Other papers argue that peace can be inefficient because of the cost of containing a military threat (Powell, 1993, 1999, 2006; Fearon, 2008; Coe, 2011; Debs and Monteiro, 2014). More closely related, Coe (2011) builds a model where one player can increase the size of the pie and the other player commits to a division of the pie, showing that peace can be inefficient under some payment schemes (proportional taxes) but not others (lump-sum transfers). None of these papers, however, endogenizes the value of the ‘pie’ while recognizing the hegemon’s commitment problem, and none of these papers explains war by rising challengers. Furthermore, we limit
inability to commit to extending favorable terms of interaction.\footnote{This raises the issue of whether international institutions that help the hegemon solve this commitment problem – such as, for example, the World Trade Organization – would significantly impact the odds of economic interdependence producing conflict. We speculate about this possibility in the Conclusion.}

Our basic argument is that, all other things equal, the higher the growth inefficiency imposed on other states by the structural conditions of the international economy regulated by the hegemon, the higher the likelihood of conflict. If the basic structure of economic interaction – terms of trade, capital flows, access to input and output markets, etc. – gives other states no incentive to invest their resources efficiently in economic growth, then a challenger may resort to war.

To show how this logic works independently of power trajectories, let us first assume the case in which the distribution of power is stable over time. The likelihood of war depends on the following variables: the cost of war; the challenger’s ability to convert economic resources into output if peace prevails; the challenger’s ability to convert economic resources into output if it wins a hegemonic war; and the challenger’s probability of victory in war. Combining these variables, we can extract general predictions for the likelihood of a hegemonic war produced by economic causes. First, the higher the cost of fighting, the less likely war is. Second, the higher the challenger’s ability to convert economic resources into output if peace prevails, the more efficient peace is, and the less likely fighting is to occur. Third, the higher the challenger’s ability to convert economic resources into output if it wins a hegemonic war, the more efficient war is, and the more likely it is that peace will break down. Fourth, and more counterintuitively, war is possible only when the challenger’s probability of victory is not too low nor too high – i.e., when the challenger is not too weak nor too strong.

Certainly, the challenger cannot be too weak, because then its expected outcome of war would be so low (given its low probability of victory) that it would accept any terms of peace the hegemon offers it. In the case of too weak a challenger, even a high inefficiency of peace dictated by the structure of the international economy would be better than the expected
outcome of a war against a hegemon, which would be all but certain defeat.

At the same time, war will not occur if the challenger is too strong. The logic in the step is simple, if counterintuitive. The higher is the probability that the challenger wins a hegemonic war, the greater is the threat that it represents to the hegemon, who will offer it more favorable terms of economic interaction peacefully. Thus, the higher is the probability that the challenger wins a hegemonic war, the better it will be able to invest efficiently in economic output, and, therefore, the lower is the inefficiency of peace. In short, when a challenger is sufficiently strong, the inefficiency of peace is small, and peace prevails.

This point is in direct contradiction with existing literature on the causes of hegemonic wars, which asserts that war only makes sense for either a more powerful but declining hegemon or for a challenger that has already become at least as powerful as the hegemon. Powerful states can extract beneficial terms peacefully through their influence, which itself flows from their relatively higher likelihood of prevailing in war. It is relatively weak states that may need to fight to obtain favorable terms of economic interaction. Put simply, we expect hegemonic wars to be launched by relatively weak challengers.

Now, let us turn to the case in which the challenger’s relative power is expected to rise over time. Our framework shows that conflict may be a rational option for the challenger even if peace would allow for its power to rise in relative terms, as long as war is expected to accelerate this rise. Put differently, whenever a challenger finds that the expected outcome of war would be less inefficient than the maintenance of peace, it will declare war immediately even if its relative power would continue to rise in case peace prevailed. This explains why even rising challengers may rationally go to war. Assume that a challenger expects to become more powerful. Its rise in power would result in an ability to extract relatively better terms of economic interaction from the hegemon, resulting in a higher efficiency in the challenger’s future investments in economic growth. But if the challenger’s greater relative power in the future would result in a greater efficiency, there is no case in which war would not make sense for the challenger now but would be rational after it has achieved greater relative
power. Therefore, whenever war would be rational for a rising challenger once it would have obtained greater relative power, war will *a fortiori* also be rational before its power rises, when defeating the hegemon would result in a greater efficiency gain in its investments in economic growth, so that conflict will always occur before, not after, a challenger’s rise in power.

In sum, a challenger may launch a war against an economic hegemon for the purpose of improving the efficiency with which it can invest its resources in economic growth only when it is neither too weak nor too strong. A challenger that is too weak would not have a reasonable chance of winning a hegemonic war. One that is too strong would not need to fight in order to get a favorable offer. We now formalize this theory using a game-theoretic model.

## 3 The Model

### 3.1 Basic Framework

We model a strategic interaction between two states, *H* (the ‘hegemon’) and *C* (the ‘challenger’). *C* possesses valuable resources that it can allocate to economic expansion. *C*’s decision to allocate $x_t$ resources to economic expansion creates a surplus $S(x_t)$ to be divided amongst the two states. We assume that $S(0) = 1$, $S'(x_t) > 0$, $S''(x_t) < 0$. In this framework, an investment in economic expansion has positive and decreasing marginal returns. The model also captures the canonical framework as a special case, when there is no endogenous investment in the surplus, so that the value of the issue in contention is fixed and constant (Fearon, 1995).

After *C*’s allocation decision, which is observed by *H*, *H* decides whether to declare war ($dw_t = 1$ if it declares war, $dw_t = 0$ if it does not). The alternative to war is a peaceful division of the pie, where *H* offers $z_t$ of the total surplus $S(x_t)$ to *C*, keeping $S(x_t) - z_t$ for itself. *C* then decides whether to accept *H*’s offer $z_t$ ($a_t = 1$ if it accepts the offer, $a_t = 0$ if it
does not). If $C$ accepts the offer $z_t$, it is implemented at $t$. If $C$ rejects $H$’s offer, war ensues. A war in period $t$ is won by country $C$ with probability $p_t$ and imposes a cost $c_i$ to country $i \in \{C, H\}$. We assume that $p_t \in (0, 1)$ for any $t$ and $c_C > 0$, $c_H > 0$. We call $c_C + c_H$ the cost of war.

Call $V$ the victor of the war and $L$ the loser. Following the literature, we assume that $V$ henceforth imposes its favorite outcome (Powell, 1993, 1999; Fearon, 1995). In our setting, this means that in the current period, $V$ earns the surplus ($S(x_t)$), and that in any future period, $V$ makes the investment decision, offers a division of the surplus, and wins any future war with probability 1.

We assume that the cost of converting economic resources into a surplus is linear in the investment, i.e., a state allocating $x_t$ resources to economic expansion pays a cost $k(\omega_t)x_t$, where $k(\omega_t) > 0$ is a cost parameter that depends on the state of the world $\omega_t$. This state of the world takes one of two values, $\omega_t \in \{\omega^P, \omega^W\}$, where $\omega^P$ signifies that peace has prevailed until the beginning of period $t$ and $\omega^W$ signifies that war has occurred some time prior to $t$. At this point, we make no assumption on the relative value of $k(\omega^P)$ and $k(\omega^W)$. We assume that the reduction in the cost of investment after war, $k(\omega^P) - k(\omega^W)$, measures the dependence of the challenger. The more dependent is the challenger, the greater would be the reduction in the cost of investment that would follow from defeating the hegemon.

Throughout the interaction between $C$ and $H$, we assume perfect and complete information. We assume that both countries discount the future (by factor $\delta \in (0, 1)$). We consider first a finite version of this game where states interact over two periods. (The Appendix includes a three-period version of the game.)

3.2 The Two-Period Game

3.2.1 Timing and Solution Concept

In period 1, the play proceeds as follows: $C$ decides how much resources $x_t$ to allocate to economic expansion; $H$ offers a division of the pie or decides to declare war; $C$ decides to
accept or reject $H$’s offer. The play continues in the same sequence in the next period as long as peace prevails. Now assume that war occurs in period $t$. In period $t+1$, $V$ decides how much to invest in economic expansions and offers a division of the pie to $L$, which $L$ decides to accept or reject. We solve for a subgame-perfect Nash equilibrium of this game.

### 3.2.2 Solving the Game

The solution in period 2 is straightforward. First, peace prevails since war is costly. Second, the terms that any state can extract are commensurate with its power. If war occurred in period 1, $V$ extracts the whole surplus, and thus allocates its resources efficiently, maximizing its own economic expansion. If peace prevailed in period 1, however, $H$’s dominant position in the international economy allows it to offer $C$ just enough of the surplus to leave it indifferent between war and peace. Since it expects to benefit only from part of the economic surplus, $C$ faces a ‘hold-up’ problem. $C$’s incentive to invest in economic expansion is weakened by the fact that $C$ can only reap a fraction of the benefits of its investment. $C$ therefore ends up under-investing in its own economic expansion and generating a suboptimal level of economic surplus. $C$’s economic growth is limited by $H$’s dominant position in the international economy. In short, the equilibrium is as follows:

**Proposition 1** In period 2, there is always peace. If peace prevailed in previous periods, $C$ chooses $x^*_2(\omega^P)$ to maximize $-k(\omega^P)x_2 + p_2S(x_2)$; $H$ offers $z^*_2 = p_2S(x_2) - c_C$ and $C$ accepts any $z_2 \geq p_2S(x_2) - c_C$. If war happened in period $t = 1$, then $V$ chooses $x^*_2(\omega^W)$ to maximize $-k(\omega^W)x_2 + S(x_2)$; $V$ offers $z_2 = 0$ and $L$ accepts any $z_2 \geq 0$.

**Proof.** Straightforward. ■

This proposition means that war allows for the aggregate resources of both countries to be invested efficiently. After war, $V$ internalizes the benefit of investing its resources in economic expansion and maximizes aggregate payoffs under the existing structure. As a result, aggregate payoffs are greater after war (as long as the cost of investing resources in economic expansion does not rise significantly after war; see Claim 1 in the Appendix).
Intuitively, there are three consequences to war. First, it gives the victor control over the current-period surplus. However, it is costly, in resources and human lives. Finally, it may change the allocation of power and resources in the next period: if a country wins, it could impose its favorite policy in the next period, after it has eliminated the military threat from the enemy.

Peace will prevail only if two constraints are met: call them the ‘feasibility’ constraint and the ‘compatibility’ constraint. The feasibility constraint requires that the minimum demand and maximum offer are feasible, or that neither demands more than the current value of the economic surplus to accept peace, i.e. $z_1 < S(x_1)$ and $\bar{z}_1 > 0$. The compatibility constraint requires that the minimum demand of the challenger is less than the maximum offer of the hegemon, i.e. $\underline{z}_1 < \underline{z}_1$ (For a derivation of the expressions $z_1$, $\bar{z}_1$, see Claim 2 in the Appendix). Whether war or peace prevails, $C$ anticipates the returns to its investment to be proportional to its power. In sum, equilibrium strategies are as follows:

**Proposition 2** In period 1, peace prevails if and only if the feasibility and the compatibility constraints hold ($\underline{z}_1 < S(x_1)$, $\bar{z}_1 > 0$, and $\underline{z}_1 < \underline{z}_1$). $C$ chooses $x_1^*$ to maximize $-k(\omega^P)x_1 + p_1S(x_1)$; $H$ offers $z_1^* = z_1$ if the feasibility and compatibility constraints hold, otherwise $H$ declares war or offers $z_1^* < \underline{z}_1$; $C$ accepts $z_1$ if and only if $z_1 \geq \underline{z}_1$. **Proof.** Follows from the above discussion. ■

Inspecting the conditions for war, we can make predictions about the structural conditions that make war more likely. The compatibility constraint, $\underline{z}_1 < \underline{z}_1$, can be expressed as follows:

$$c_C + c_H \geq \delta \left[ (-k(\omega^W)x_2^*(\omega^W) + S(x_2^*(\omega^W))) - (-k(\omega^P)x_2^*(\omega^P) + S(x_2^*(\omega^P))) \right] \quad (1)$$

This constraint implies that a necessary condition for peace is that the cost of war is greater than the inefficiency of peace. The inefficiency of peace, in turn, depends on the severity of the hold-up problem that the challenger faces.
If the surplus is fixed and exogenously-determined, as is the case in the standard rationalist framework, then there is no inefficiency of peace and the compatibility constraint is always met, given that war is costly (see Claim 3 in the Appendix). War occurs only if the feasibility constraint fails, and it may fail only for the declining state. If a state is rising, it wants to rise peacefully, and may even accept none of the current surplus in order to let the favorable shift in power occur and extract a greater share of aggregate wealth in the future. It is the declining state that may want to strike preventively. Even if it receives the full surplus in the current period, if the shift in power is sufficiently large, the declining state may prefer war in order to prevent its enemy’s rise (Fearon, 1995; Powell, 2006). Also, the declining state will declare war only if it is currently strong.

If the surplus is endogenous, however, the compatibility constraint may fail, because peace in period 1 may lead to aggregate inefficiency in period 2, due to the hold-up problem described above. Assuming that the only impediment for peace is the compatibility constraint, we can now make predictions about the likelihood of war. It is clear that war obtains whenever its cost is lower than the inefficiency of peace. The inefficiency of peace increases with the inefficiency of investing in economic growth in peacetime, and decreases with the inefficiency of this investment after war. The greater is the inefficiency of economic growth in peacetime, the more constrained is the challenger in its efforts to convert economic resources into output, and the farther is its investment to the efficient level. By the same token, the lower is the inefficiency of economic growth after war, the greater would be the increase in the victor’s ability to convert resources into output after defeating its enemy, and the greater is the relative inefficiency of peace. Put differently, the greater is the dependence of the challenger on the hegemon – i.e., the greater is the reduction in the cost of the investment after war – the greater is the likelihood of war. Finally, the weaker is the challenger, the less able it is to use the threat of war to extract favorable terms of peace from the hegemon. As it receives a smaller share of its investment in peace, the challenger is less able to grow efficiently in peacetime under the system dominated by the hegemon, and the more tempted it is to declare war. In sum:
Result 1 War is more likely, everything else equal,

a) the lower is the cost of war \(c_C + c_H\);

b) the higher is the cost of investment in peace \(k(\omega^P)\);

c) the lower is the cost of investment after war \(k(\omega^W)\).

d) the lower is the probability that the challenger wins a conflict in period 2 \(p_2\).

Proof. See the Appendix.

3.3 Extension: Power Shifts and Hegemonic War

We can use this framework to reflect on the relationship between power shifts and hegemonic war. There are two competing views in the literature. The informal literature on power transitions suggests that a rising state should wait until its power increases before declaring war, thereby enjoying a higher likelihood of victory. The rationalist framework suggests that power shifts can only induce a declining state to declare war, so as to prevent a large and rapid adverse shift in the balance of power.

The informal argument, while intuitive, is incomplete. After a state has risen in power, it is more likely to prevail in war. By the same token, a state that has grown more powerful can use the threat of war more effectively. Why would a state that has grown more powerful decide to go to war, instead of revising the terms of peace to obtain a more favorable bargain? Still, it is possible that there is a deeper cause for the rising state to launch a war, beyond the power shift itself.

The rationalist framework, for its part, acknowledges the inefficiency of war, but its focus on power shifts may be unduly restrictive in analyzing the causes of hegemonic wars. Assume that we observe a challenger rising in power and declaring war against a hegemon. Did the power shift cause war? We argue that the balance of power itself, not the power shift per se, could be the cause of the conflict: if the challenger is too weak to grow in the system dominated by the hegemon but too strong to be forced to accept any offer the hegemon
makes, it may decide to go to war.\textsuperscript{6}

Once we view the problem through this lens, we can take the logic a step further and ask under what circumstances would a challenger wait for its rise to be completed before going to war, even if fighting is costly and destructive. Since we cannot really answer this question using the baseline two-period model given that in this setup peace always prevails in the second period, we now consider a three-period game by adding a period 0 preceding 1 and 2, with power rising between each period.

Intuitively, we expect that a state could wait for its power to rise before declaring war if, before the rise in power, it is so weak that it would accept any peaceful offer ($z_0 < 0$), and after its rise in power, it would reject some peaceful offers ($z_0 > 0$) but it is still sufficiently weak that the inefficiency of peace is greater than the cost of war (inequality 1 fails). Now assume that the challenger is sufficiently strong that it would reject some peaceful offers in period 0 ($z_0 > 0$). Then we can show that if a state would declare war in period 1, it strictly prefers to declare war in period 0, before its rise in power.

The intuition follows from Result 1 d) above. The stronger is $C$, the more effective it is at using the \textit{threat} of war to extract favorable terms. In that case, the inefficiency of peace is lower, and the benefit of being able to set a different structure of the international economy by defeating the hegemon is also lower. If war is inevitable in period 1, it is because $C$ believes that it would not be able to extract sufficiently favorable terms in period 2 if peace prevailed. But, given that $C$ is rising between each period, the inefficiency of peace would be even larger in period 1 than in period 2. Therefore, if the inefficiency of peace was sufficiently large in period 2 to warrant war in period 1, it will also be sufficiently large in period 1, so that $C$ would prefer to go to war in period 0, \textit{before} its rise in power. In sum, as soon as a rising challenger has sufficient power to expect that victory in war will, even despite its relatively low probability, lead to faster economic growth, it will launch war without waiting

\textsuperscript{6}If the balance of power were endogenous, the challenger might decide to prepare for the inevitable war, and we would observe first a rise in power and then a declaration of war. Yet both the rise in power and the ultimate war would be caused by the initially unfavorable balance of power for the challenger.
for an additional increase in its relative power. We think that this is an interesting theoretical possibility. At the same time, we prefer to keep the focus on the balance of power itself—not on a shift in the balance of power—as the key predictor of the likelihood of hegemonic wars.

Now we discuss three additional extensions of the model. First, an infinite-horizon game. This extension shows that our results are robust to situations in which states are engaged in an ongoing relationship. Second, a model where the hegemon sets the cost of the resource $k(\omega^P)$, depending on the strategic value of the resource. This extension shows that the hegemon’s policies are endogenous to changes in the structure of the international economy and, therefore, are not ultimately responsible for the challenger’s decision to go to war. Finally, we present a model where the hegemon also invests in the creation of the surplus. This extension demonstrates that economic interdependence, although it restricts the area of the parameter space in which war is rational, does not eliminate it. (To be completed.)

4 Empirical Illustrations

We now use our theory to put forth a novel account of the deep causes of WWII in Europe and the Pacific. We detail how, at the outset of the 1930s, Germany, then a relatively weak country dependent on U.S. capital, concluded that it was not possible to grow in the U.S. dominated international economic system. Japan, which depended heavily on U.S.-dominated markets for raw resources, especially oil, reached the same conclusion. Both Germany and Japan were weak relative to the United States, and could not obtain sufficiently generous terms of trade to allow for efficient growth. Both countries perceived that the cost of converting economic resources into output would be significantly lower if they would be able to prevail in a war against the United States. In each case, we contrast our argument with existing alternative explanations for the war.

Each of the two following case studies focuses on the core dynamics highlighted by our theory. Therefore, we omit many important developments leading up to the events of De-
cember 1941 – when Japan launched a war against the United States and, responding to Washington’s declaration of war on Japan in the aftermath of Pearl Harbor, Germany also declared war on the United States. Among these developments we elide in order to focus on our causal logic are Germany’s and Japan’s military pursuits to attempt to develop a sphere of influence autonomous from the United States, namely by going to war in Eastern Europe and East and Southeast Asia, respectively. From the point of view of our theory, these developments are tactical moves subordinated to these challengers’ ultimate goal of being able to extract better terms of economic interaction from Washington. Unable to do so while avoiding war with the United States, both countries ultimately decided for a military challenge to America.

4.1 The Causes of World War II in Europe

Existing explanations for WWII in Europe focus on the Western Powers’ decision to declare war on Germany (Powell, 2006; Taliaferro, Ripsman and Lobell, 2013). Having established that Hitler could not be satisfied with concessions, London decided to declare war on Germany – responding to Berlin’s invasion of Poland on September 1, 1939 – before it grew too powerful. This explanation of the war is incomplete, however, in that it does not account for Germany’s policy aims. Why did Germany adopt an aggressive foreign policy that ultimately led to war with Western Europe?

Understanding Germany’s confrontational foreign policy may be the most important element in an account of WWII. Indeed, it is not clear that, had London and Paris acquiesced to Germany’s conquest of Poland, peace would have prevailed. London and Paris had repeatedly tried to appease Hitler, after the reinstatement of military conscription in 1935, the March 1936 remilitarization of the Rhineland, the Austrian Anschluss of 1937–38, and the 1938 Sudeten crisis. Each of these crises could have led to war even sooner than 1939 were the Western Powers decided to stop German gains even earlier (Ripsman and Levy, 2007). This policy of appeasement was ultimately discredited when it became clear that
peace with Hitler was impossible. In our view, understanding Western Europe’s decision to declare war on Germany – after it became clear that it could not be appeased, but before it grew too powerful – may explain the timing of WWII, but not necessarily the initiation of the war itself. At the very least, understanding Germany’s confrontational foreign policy is an important element in understanding the causes of WWII.

The remainder of this case study is devoted to establishing two central points. First, Germany’s adoption of a bellicose challenge to the international status quo was a response to its inability to grow economically in the international environment that ensued the 1929 U.S. stock-market crash. Given the almost complete dependency of the German economy on U.S. capital during the late 1920s, the contractionist character of the post-1929 international economy foreclosed any avenue for peaceful growth for a relatively small economy such as Germany’s, fating the country to a secondary power status vis-à-vis the United States. The dire economic situation this structure of the international economy produced in Germany, in turn, boosted popular support for Hitler’s revisionist agenda, which would ultimately lead Germany towards an armed challenge to the status quo. Hitler’s views, calling for the overthrow of Versailles if necessary by force in order to guarantee Germany’s growth, went from a fringe position by 1928 to a widely held creed in Germany by 1933.

Second, we establish the central role played by the United States in Hitler’s strategic vision. Hitler’s ultimate strategic goal was to reorganize – through morally abhorrent means – the economic space of continental Europe under German leadership, in order to be able to compete with the United States, which he considered, rightly, to be the world’s foremost economic powerhouse. In this view, Germany would be able to grow faster by launching an armed challenge to the status quo than from continuing to operate in the highly disadvantageous international economic order set by the U.S. hegemon. The literature on the causes of WWII typically focuses on the Western Powers’ shift from appeasement to war, assuming the irrationality of Hitler’s strategy, and in our view missing the deep economic causes of the war (Taliaferro, Ripsman and Lobell, 2013). That Hitler’s strategy was morally repug-
nant does not mean it was entirely irrational. The goal of obtaining conditions that would enable Germany to compete with or even surpass the United States as the world’s foremost economic power was key to Nazi grand-strategic aims.

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The first section of this case, therefore, is devoted to understand the economic reasons behind the collapse of the Weimar Republic and the rise of the Nazi Third Reich. The basic strategic dilemma faced by Germany since the inception of the Weimar Republic in 1919 was straightforward. It could try to grow peaceful or it could attempt yet another militarized challenge to the international order. These two positions were based on different understandings of Germany’s role in the world economic order. The first position dominated German politics until 1933. Gustav Stresemann – Berlin’s Foreign Minister between 1923 and 1929 – was the foremost proponent of this view, labeled “politics of the possible” (Politik des Moeglichen), which sought to boost Germany’s economy by establishing closer ties with Washington, and endorsed a model of international competition “softened by his understanding of the mutual interconnectedness of the world economy and above all by the importance he attached to the United States” (Tooze, 2006, 8). The second position – personalized by Nazi leader Adolf Hitler – required Germany to challenge the international order by military means, as it had done in 1914-18. In this view, German economic competitiveness required a domestic market of commensurable size to the U.S.’s, populated by inhabitants as productive as the immigrants Washington had managed to attract. This, in Hitler’s view, required both the military conquest of most of continental Europe and its repopulation with Aryan peoples.
Given Germany’s strategic situation, as a relatively weak country with limited markets for inputs and outputs, the peaceful growth strategy was risky and highly dependent on a favorable structure of the international economy. After the 1929 crash, Stresemann’s strategy was discredited. Specifically, the shift in German policy was partly a consequence of the tightening of U.S. credit markets in the aftermath of the 1929 stock-market crash, which made capital more valuable for the United States, making Washington unwilling to guarantee the availability of credit for Germany (Leffler, 1979; Burke, 1994; Clavin, 1996; Cohrs, 2006; Tooze, 2006). As Tooze (2006, 13) writes, “[o]ne key factor contributing to destabilization of the Weimar Republic after 1929 was the disappointment of the hopes invested in America’s ‘new order’ by Germany’s pro-Republican forces.” Once the peaceful-growth strategy was discredited by international developments, the military-challenge strategy quickly gained traction.

The history of the post-WWI period is well known. The 1919 Versailles Treaty required Germany to pay substantial reparations to Allied powers for causing WWI (Trachtenberg, 1980; Schuker, 1988; Kent, 1989; Boemeke, Feldman and Glaser, 1998; Cohrs, 2006). After initial resistance, the Berlin government agreed to payments starting in 1921, and initially pursued a strategy of seeking eventual revision of its obligations through the fulfillment of its payment requirements (Trachtenberg, 1980; Webb, 1989; Ferguson, 1996).

Soon thereafter, however, Germany defaulted on reparation payments, prompting French and Belgian troops to occupy the Ruhr region in 1923. The Ruhr occupation would prove to be a turning point in interwar politics. The German currency collapsed and hyperinflation followed, leading Weimar leaders to focus on the economy (Schuker, 1988; Ferguson, 1996). Like Hitler, Stresemann believed that the rise of the United States meant that the future “balance of power would be defined … by the relationship of the competing interests in Europe to the United States” (Tooze, 2006, 4). This dictated the need for a rapprochement between Berlin and Washington.

At the same time, the Ruhr crisis led to U.S. entanglement in continental affairs in an
attempt to create a more stable “reparations regime” (Costigliola, 1984, 119-123; Cohrs, 2006, 137). The resulting Dawes Plan of 1924, suspended immediate German reparation payments and lowering them for 1924-27. Crucially, the plan included a large U.S. private loan to the German government, which triggered a boom in U.S. private loans to Germany, entailing significant political risk and marking the beginning of German dependency on American capital (Marks, 1978, 245-249; Schuker, 1988). U.S. private lending to Germany created a circular system of payments in which all participants had a stake: Germany obtained credit from the United States, enabling it to make reparation payments to Britain and France, which could then repay their inter-allied war debts to the United States. For Berlin, this meant financial dependency on Washington. As Tooze writes:

This merry-go-round in which Germans borrowed money from the Americans to pay the British and French who then paid the Americans raised anxiety on all sides. However, it served its purpose. ... The new American lenders to Germany were making handsome profits. And the Weimar Republic enjoyed a standard of living considerably higher than would have been possible if it had been constrained to pay reparations out of an export surplus. (Tooze, 2006, 6)

Recognizing that an economic crisis in Germany would put U.S. private creditors at risk, Washington tried to tame Berlin’s financial appetite but ultimately allowed U.S. banks to continue unrestricted lending (Schuker, 1988; McNeil, 1986, 176-193; Cohrs, 2006, 484). As McNeil (1986, 161) noted, by 1927 “German dependence on American capital seemed to be an inevitable fact of life.” The rise in standards of living made possible by the inflow of American credit had a clear political effect. In the May 1928 federal election for the German Reichstag the Nazis achieved no more than 2.5 percent of the votes in their stronghold, Bavaria (Tooze, 2006, 12-13). As late as 1928, then, the Weimar Republic continued working as a political system focused on achieving economic growth through cooperation with the United States.
After 1928, however, things changed quickly. Starting late that year, the U.S. credit market tightened and interest rates rose, ending long-term loans to Germany (McNeil, 1986, 217-219; Tooze, 2006, 14). Unable to access U.S. capital in favorable terms, Germany demanded another revision of reparation payments. The resulting Young Plan of June 1929 cut down the total value of reparations and extended their payment period until 1988. Crucially, each annual payment would be divided into a one-third unconditional component and a two-thirds postponable component, to be financed by private U.S. banks (Leffler, 1979, 195, 202-216, 228-229; Enssle, 1980, 182; Costigliola, 1984, 210-217). Given the assumptions on which it was based, particularly about the functioning of the international economy, the Young Plan was fated to fail (Leffler, 1979, 211-212).

In fact, even before the Plan would come into effect in January 1930, the U.S. economy suffered the October 24, 1929 “Black Thursday” stock market crash (Leffler, 1979, 215-216; Kindleberger, 1986, 118). The near-collapse of the U.S. financial system meant that German access to private U.S. capital was further reduced. As Carl von Schubert, the state secretary at the German foreign ministry said at the time, “A direct demand on the foreign market by the Reich government for either long- or short-term loans is no longer a possibility” (quoted in McNeil, 1986, 269).

In Germany, therefore, the onset of the U.S. Great Depression discredited the peaceful-growth strategy. Over the next three years, the U.S. banking system, under great strain, had to limit its exposure in Germany, precluding the loans presupposed by the Young Plan, and drastically curtailing the availability of capital to the German economy. As Burke writes, it was American policy that established the system of international exchange.

The cycle of reparations and war debts payments was financially dependent on

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7 Many claim that the German economic trouble was compounded by the protectionist Smoot-Hawley Tariff Act trade of June 1930 (Costigliola, 1984, 231; Tooze, 2006, 14). But, as Irwin (2012, 15-16) shows, this measure had a limited impact. Dutiable imports amounted to only 1.4% of U.S. GDP. Furthermore, tariff increases were not particularly high: from about 38% to 45%. This resulted in a 15% decrease in dutiable imports. Since only 6% of Europe’s exports were destined for U.S. markets, the Tariff cannot account for the collapse of the German economy that ensued.

25
American loans. When the outflow of capital from the United States dried up, the system was bound to founder. (Burke, 1994, 128)

Germany experienced a sharp drop in national income and industrial production. Unemployment “rose dramatically, from 1.3 million in September 1929 to over 3 million in September 1930, 4.3 million in September 1929 and 5.1 million in September 1932” (Kolb, 2004, 111). By the time Hitler would be appointed Chancellor in early 1933, a third of the labor force was unemployed (Kolb, 2004, 111). The Nazis actively portrayed this situation “as a consequence of the ‘system,’ and ruthlessly mobilized open and latent resentment of parliamentary democracy” (Kolb, 2004, 112).

In sum, the onset of the Great Depression produced “political and economic circumstances combined with the public mood to create a situation especially favorable to National Socialist agitation and action” (Kolb, 2004, 108). Over the following three years, the Nazis went from an obscure fringe political group to Germany’s main political party. This evolution was facilitated by a combination of two factors. First, controversy around the Young Plan gave the Nazis an issue to exploit, opposing the still substantial annuities and the prospect of six further decades of reparation payments (Kolb, 2004, 108-109). Second, Germany was particularly hard-hit by the Great Depression because “her economic development was based largely on short-term foreign credits which were now called in” (Kolb, 2004, 111).

The political consequences of this economic downturn were visible already in the September 1930 election, in which the Nazis, which two years before had elected only 12 of 491 parliamentary seats, now elected 107 out of 577 seats, becoming the second largest party. Trying to preempt future Nazi electoral gains, Chancellor Bruening demanded further reparation revisions (Clavin, 1996, 10). This further shook international financial markets, raising “the danger of the repudiation of debts and other contractual obligations,” and accelerating the flight of U.S. capital (Burke, 1994, 83).

When in May 11, 1931, an Austrian banking crisis broke out, “the withdrawal of German short-term credit became a flood” (Clavin, 1996, 12). The credit shortage triggered a German
financial crisis (Costigliola, 1984, 235), which prompted Bruening on June 6 to issue “an aggressive demand for an end to reparations” (Tooze, 2006, 18). The quickly deepening crisis led to the June 20, 1931 Hoover moratorium, which froze German reparation payments (Marks, 1978, 253; Clavin, 1996, 14). This failed to stop the banking crisis in Germany and stem the flight of foreign capital, however. Despite the moratorium, “[m]oney continued to flood out of Germany at a faster rate than before” (Clavin, 1996, 16). Weeks later, a German banking crisis broke out with the collapse of the DANAT bank, prompting a general bank run (Costigliola, 1984, 238) and leading the Berlin cabinet to close down the entire German financial system, abandon the free gold standard, and nationalize all private holdings of foreign currency (Tooze, 2006, 20).

In an attempt to stop the damage, an international financial conference was held in London in July 1931, including the United States. Delegates agreed “that the central bank credit of $100 million [to the Reichsbank] should be renewed, [that] a standstill of existing credits should be implemented, and [that] a committee to study Germany’s long-term needs should be established” (Leffler, 1979, 255). This meant further U.S. involvement in European affairs (Leffler, 1979, 256). The Standstill agreement was put in place in August-September 1931 and “Weimar’s foreign creditors voluntarily agreed to freeze their credits inside Germany” (Clavin, 1996, 16).

Having left the gold standard, the German mark could quickly lose value. As German debts were mostly denominated in foreign currency, any devaluation would have the effect of putting at stake Germany’s ability to service its foreign debt. Washington therefore leaned on the Berlin government to impose exchange controls (Irwin, 2012). Berlin complied in a last-ditch attempt to cling to its Atlanticist, peaceful-growth strategy: “Chancellor Bruening’s government gambled that, sooner rather than later, American action on war debts would enable Britain and France to accept the end of reparations. This ... would open the door to the normalization of both political and economic relations in Europe” (Tooze, 2006, 22). Alas, any discussion of the end to reparation payments and inter-Allied war debts would
have to wait for another year, until the July 1932 Lausanne Conference. In the meantime, the German economy continued its downward spiral – dragging with it the peaceful-growth strategy that defined Weimar foreign policy.

By late 1931, as Bruening continued to impose deflationary austerity measures by decree amid a widespread financial and economic crisis, his government’s political support basis collapsed. The deep transformation of the international economy over the previous two years had played a prominent role in the ongoing political shift in Germany:

The collapse of the American economy and the British decision to abandon gold shattered the fundamental assumption on which Stresemann’s conception had been based. Far from being a self-evident historical necessity, the unity and mutual interdependence of the world economy was now profoundly in question ... [I]t appeared to many that international economic dependence itself was actually the problem. Nationalist visions, visions of a future in which global financial connections were not the determining influence in a nation’s fate, now had a far greater plausibility. (Tooze, 2006, 23-24)

The Hoover administration made its last attempt to solve the crisis at the Lausanne Conference of July 1932, which discussed German reparation payments and inter-Allied war debts (Clavin, 1996, 31). Representatives of Britain, France, and Germany recognized Germany’s inability to restart reparation payments and agreed to prolong their suspension and, more importantly, cancel about 90% of German reparations (Costigliola, 1984, 257; Marks, 1978, 253-254). This agreement had a glitch, however. It depended on U.S. pardon of most British war debts (Cohrs, 2006, 44), which would be rejected by the U.S. Congress in December 1932.

By then it was too late to save the Weimar Republic. In the March 1932 German presidential elections, President Hindenburg had been reelected but required a runoff to defeat Hitler by 54%-37% (Burke, 1994, 190-192). Then, in the parliamentary election of November
that year, the Nazis retained 196 seats, consolidating their position as the first political force in Germany. On January 30, 1933, Hindenburg appointed Hitler as Chancellor. His government would repudiate both reparations and war debts, making no further payments. Instead, Hitler led Germany in a crash militarization program aimed at challenging the U.S.-led global order.

In sum, the German economy, once the hyperinflation of the early 1920s had been contained, worked relatively well until the U.S. stock-market crash of 1929. This relatively smooth period was the result of U.S. efforts towards “building a secure world open to trade, investment, and peaceful change” (Costigliola, 1984, 112). German economic growth therefore depended largely on abundant U.S. private loans. As Schuker puts it, the flow of American capital into Weimar Germany was “one of the greatest proportional transfers of wealth in modern history” (Schuker, 1988, 120). Germany received more funds as loans from U.S. private banks (27 billion marks) than the totality of the reparations it had to pay (19.1 billion marks) in 1921-1931 (Marks, 1978, 254; Ferguson, 1998, 417). U.S. efforts abruptly collapsed with the onset of the Great Depression, which led to the rapid withdrawal of U.S. private loans. From 1929 on, Washington repeatedly refused German requests for loans, a manifest “failure in leadership” (Kindleberger, 1986, 133; see also: Leffler, 1979, 194-195, 228-229; Clavin, 1996, 16). Since Germany was largely dependent on these loans both to pay reparations to Britain and France and to finance its own economic activity, the rapid collapse of the credit markets led to the collapse of the German economy.\(^8\) The peaceful-growth strategy was crippled, opening the door to the rise of Hitler, who propounded a strategy of challenging the Versailles order militarily in order to acquire control over the resources necessary to compete with the United States in the global market.

\(^8\)Note that our argument is not that war reparations were so vast that they crippled the German economy. As Ferguson and others have shown, this was not the case. (Nor could it explain the timing of the German economic collapse.) German reparation payments were manageable. Even the initial reparation annuities imposed in the London 1921 conference represented only 4-7% of German national product (Ferguson, 1998, 414). This was at most a third of what France was forced to pay in war reparations to Germany in the aftermath of its defeat in the 1870 Franco-Prussian war (Ferguson, 1998, 415). For a dissenting opinion, claiming that the failure of the interwar system lies primarily with the reparations system itself, since Germany could not possibly meet its reparations, see Kent (1989).
Once the United States set the precedent for supporting financial-cum-political agreements with the Dawes Plan, and once Washington allowed the establishment of a system of financial transfers backed by private U.S. loans, the Weimar political system and, more broadly, the maintenance of peaceful relations in Europe required continued U.S. engagement both in terms of sustaining any further agreements that proved necessary as conditions changed and, crucially, of providing the financial backing for these agreements (Cohrs, 2006). When Washington, under the strain of rapidly worsening domestic economic conditions, failed to provide this leadership, the European system collapsed. The United States, acting in its capacity of an economic hegemon, and failed with the scarcity of capital caused by the onset of the Great Depression, failed to commit itself to ensuring the conditions for the peaceful growth of Germany.

Having shown the role of changing international economic conditions in constraining Germany’s economic growth and contributing to the fall of the Weimar Republic and the rise of Hitler, we now turn to demonstrating how the ability to compete with the United States was a key component of Hitler’s strategic vision.

Germany’s strategy since 1933 was one of militarized challenge to the status quo. This challenge was predicated on a strategic vision that, because of the unspeakable devastation it caused and of the morally abhorrent decisions it entailed, is usually cast in irrational terms. Without in any way questioning the profoundly immoral nature of Hitler’s actions, we show how Hitler’s strategic thinking included a means-ends calculation about how best to ensure Germany’s position among the great powers. Specifically, Hitler’s strategy of territorial conquest in Eastern Europe and the concomitant replacement of its Jewish and Slav with “Aryan” population was, in his eyes, a necessary condition for competition with the country he saw as the greatest threat to Germany’s future: the United States.

The notion that the United States would be the ultimate adversary in a German bid for world domination was indeed correct. Whereas by 1870, the United States and Germany each controlled 16% of world wealth, by 1920 Washington controlled 62% of world wealth
compared with Berlin’s 14%. By 1940, the last year before war broke out between the two countries, their relative shares are 49% and 17% respectively (Mearsheimer, 2001, 220).

Among Hitler’s writings and speeches, *Mein Kampf*, produced while in jail and published in 1925-26, is usually acknowledged as containing the most comprehensive statement of his strategic vision. Certainly, Hitler’s idea that Germany needed to acquire *Lebensraum* in the East, his hatred for what he called “the world’s twin evils” of Bolshevism and Judaism, and his paranoid notion that Germany was the victim of an international Jewish conspiracy are already there. In contrast, Hitler’s *Zweites Buch*, written in 1928, remained unpublished until 1958, and has been largely ignored as merely rehearsing the arguments already made in *Mein Kampf*. But although the *Zweites Buch* does rehearse many of the same arguments as *Mein Kampf*, it also contains a difference of crucial importance in understanding the strategic vision Hitler had formed by the time he came to power in 1933: its discussion of the role of the United States in Hitler’s worldview (Fischer, 2011).

In *Mein Kampf*, Hitler’s vision for Germany’s strategic trajectory started with the need to rearm the nation, followed by a military conflict aimed at acquiring sufficient *Lebensraum* for the German people, a goal that required the destruction of the Soviet Union and the annihilation of its population. In the *Zweites Buch*, however, this is merely a means to an end. By 1928, Hitler added a new, final stage to his vision of Germany’s strategy: a struggle for world domination between a German-controlled Europe and the United States. As historian Richard Evans states:

> The core of Hitler’s foreign policy aim was to invade and conquer eastern Europe, to expel or eliminate the vast majority of the Slavs who lived there. To create in eastern Europe what he thought of as the equivalent of the American West – a kind of bread basket for Germany. Somewhere where industrial resources, agricultural resources, would make Germany into a world power capable of standing head-to-head with America in the longer run. (Evans, n.d.)
Specifically, Hitler projected a final military showdown with the United States. As he wrote, “it is thoughtless to believe that the conflict between Europe and America would always be of a peaceful economic nature” (Hitler, 2003, 116). America’s role in Hitler’s strategic vision also helps account for what is perhaps the most catastrophic strategic decision of the twentieth century. Anticipating the need to fight the United States, Hitler responded to the U.S. declaration of war on Japan in December 1941 with his own declaration of war on the United States, which Berlin’s treaty obligations towards Tokyo did not require. With German forces at the gates of Moscow, by late 1941 Hitler expected to finish off the Soviet Union in the very near future. At the same time, once Washington declared war on Japan in the aftermath of Pearl Harbor, he expected U.S. forces to be mostly devoted to fighting in the Asia-Pacific region. By declaring war on the United States, Hitler expected not only to bring Britain to the negotiating table but, more importantly, to anticipate the last stage of his strategy: a fight for global hegemony against the United States. This decision proved to be a fateful mistake. Seen through the prism of Hitler’s strategic vision, however, it was hardly an inexplicable blunder.

In sum, in Hitler’s strategic vision, “Fordist” America – his preferred term for the industrialized economy of the United States – was both Germany’s ultimate competitor and its greatest role model. Aspiring European great powers required an equally vast domestic market. Without the scale of America’s natural and human resources, Hitler thought, Europe would be destined to have the status of “Holland or Switzerland or Denmark” (Hitler, 2003, 128). The size of America’s domestic market permitted high wages and standards of living while underselling foreign competitors, which were therefore doomed in their quest to compete with the United States (Hitler, 2003, 106-107). As Tooze (2006, 10) put it, “Fordism ... required Lebensraum.” Or, at greater length:

America should provide the pivot for our understanding of the Third Reich.
In seeking to explain the urgency of Hitler’s aggression, historians have underestimated his acute awareness of the threat posed to Germany, along with the
rest of European powers, by the emergence of the United States as the dominant global superpower. On the basis of contemporary economic trends, Hitler predicted already in the 1920s that the European powers had only a few more years to organize themselves against this inevitability. Furthermore, Hitler understood the overwhelming attraction already exerted on Europeans by America’s affluent consumer lifestyle, an attraction whose force we can appreciate more vividly, given our sharpened awareness of the more generally transitional status of the European economies in the inter-war period. ... The originality of National Socialism was that, rather than meekly accepting a place for Germany within the global economic order dominated by the affluent English-speaking countries, Hitler sought to mobilize the pent-up frustrations of his population to mount an epic challenge to this order. ... Germany would carve out its own imperial hinterland; by one last great land grab in the East it would create a self-sufficient basis both for domestic affluence and the platform necessary to prevail in the coming super-power competition with the United States. (Tooze, 2006, xxiv)

To conclude, as an economic hegemon with a large influence on financial markets, the United States had for most of the 1920s bankrolled the recovery of the German economy. When capital became scarce in the aftermath of the 1929 U.S. stockmarket crash, however, Washington failed to take the steps necessary to ensue continued German access to capital markets. Finding itself unable to grow in the international economic structure of the Great Depression, Germany shifted to a policy of military challenge to the status quo, ultimately aimed at defeating the United States and imposing on Washington more beneficial terms of international interaction.

4.2 The Causes of World War II in the Pacific

Our framework also sheds light on the origins of WWII in the Pacific. At a deep level, war between Japan and the United States resulted from their incompatible economic policies.
The cornerstone of Japan’s foreign policy was to create a sphere of influence in East Asia. The underlying principle of American economic policy was to defend the Open Door policy in China, and prevent Japan from imposing an economic empire. Given that the United States exercised a great degree of control over the supplies of oil – a key input in its economic development – to Japan, Tokyo’s attempts to expand its sphere of influence were eventually met with a decision in Washington to restrict the flow of oil to the Japanese economy. Faced with such unfavorable terms of interaction and unable to produce economic growth, Japan ultimately decided to go to war against the United States.

Japan’s foreign policy aimed at creating a sphere of influence in East Asia. Japan was highly dependent on foreign markets for raw materials and exports, and ventured on the Asian continent to gain control of additional resources and markets. It acquired control over Taiwan after the first Sino-Japanese War (1894-5); the Liaotung peninsula, after the Russo-Japanese war (1904-5); and resource-rich Manchuria, in March 1932 (Barnhart, 1987, 27-33). In July 1937, the long and costly second Sino-Japanese war erupted (1937-45).

Japanese leaders articulated the equivalent of a “Monroe Doctrine” for East Asia. In 1934, the Japanese Foreign Ministry claimed that Japan had the right to supervise all of China’s economic development (Iriye, 1973, 108; Barnhart, 1987, 116; LaFeber, 1997, 177). Four years later, Japanese Prime Minister Konoe Fumimaro pronounced his famous address for a “New Order in East Asia,” claiming that Japan should control the destiny of the Japan-China-Manchukuo bloc (Iriye, 1987, 67-68; Barnhart, 1987, 131; LaFeber, 1997, 189). Shortly afterwards, Japan’s foreign minister Arita Hachiro explained in a note to U.S. Secretary of State Cordell Hull that “the principles of Open Door should not apply to China alone when they were not observed elsewhere in the world. The United States and Britain could demand the Open Door only because they were self-sufficient and militarily secure already” (Barnhart, 1987, 131-132). Two years later, on August 1st, 1940, Japanese foreign minister Matsuoka Yosuke issued a press release expanding the projected sphere of influence, now called the “Greater East Asia Co-Prosperity Sphere,” to include Australia, Borneo, Burma,

The United States consistently opposed these Japanese attempts to establish a sphere of influence in Asia. Washington had a long-standing commitment to defend the Open Door policy in China. In fact, according to historian Walter LaFeber, “[e]verything [U.S. Secretary of State Cordell] Hull had tried to achieve since he had entered the State Department was aimed precisely at destroying such regional blocs and Japan’s (or any non-American) ‘Monroe Doctrine.’ Roosevelt, with less passion, agreed” (LaFeber, 1997, 193). After the escalation of hostilities in the second Sino-Japanese war in 1937, Roosevelt made a famous “Quarantine Speech,” calling for “peace-loving nations” to contain the spread of war (Barnhart, 1987, 123; Utley, 2005, 16).

Furthermore, the United States imposed a series of “moral embargoes” on Japanese trade. When Japan occupied southern French Indochina, the United States responded with a complete embargo on oil in July 1941. This put enormous pressure on Japanese decision-makers, since the country imported so much of its oil from the United States. They were convinced that they faced two undesirable choices: war against a much stronger economy or economic collapse (Wohlstetter, 1962, 356-357). Over long and protracted debates, Japanese decision-makers chose war, and on December 7th, 1941, Japan attacked the U.S. Pacific Fleet at Pearl Harbor.

In sum, Japan’s perception that it could not grow peacefully in the world economic system dominated by the United States prompted its desire to impose an economic sphere of influence. When Tokyo understood that this aim could not be achieved without fighting the United States, Japan initiated the Pacific War. This in our view is the essence of a rationalist explanation of the Pacific War. Understanding the Pacific War has challenged IR theorists ever since. By declaring war on the United States, Japan took on a much stronger enemy, which had eight times as much latent power and ultimately imposed severe damage and obtained unconditional surrender. How could such a decision be understood?
Initial observers, and many IR scholars since, have described Japan’s decision as irrational.9 The first rationalist explanation for the war arguably came from Russett (1967). According to him, the archival evidence clearly shows that Japanese decision-makers chose war because the alternative was undesirable, given adverse U.S. trade policy. Such an argument provides the foundation of any rationalist explanation for the war, but it does not fully explain the puzzle of war. Given that war is costly and destructive, how could states decide that war is preferable to peace?

One way to rationalize the war is to posit that the preferences of Japanese decision-makers made war a better option than peace. War offered the prospect, however slim, of a sphere of influence in East Asia and a brighter economic future. If Japanese decision-makers weighed prospective gains sufficiently heavily, they may favor war over peace (Taliaferro, 2004, chapter 4). Perhaps there was some element of wishful thinking in exaggerating the odds of victory, hoping that American public opinion would turn against a costly war and pressure their government to sue for peace (Russett, 1967, 99). Alternatively, war may have been irrational for the country as a whole but rational for Japanese decision-makers (Snyder, 1991, chapter 4). Members of the Army and Navy may have excessively benefited from expansionary policies, and successfully sold the “myth” of imperialism to the rest of the country.

Finally, it is possible that the war was not a conscious decision of either Japan or the United States. Japan’s decision to attack Pearl Harbor, rather than British or Dutch targets in Southeast Asia, was apparently never debated in cabinet meetings. Instead, this decision was taken by Navy, who treated it exclusively as a tactical decision, without analyzing the strategic consequences of a direct attack on the United States on U.S. public opinion (Russett, 1967, 99; Sagan, 1988, 916). On the American side, the oil embargo of July 1941, which heightened Japanese concerns about the consequences of peace, may have resulted from bureaucratic overreach (Utley, 2005; Sagan, 1988). When Roosevelt announced a freeze on Japanese assets, he asked for a review of requests for oil before issuing any license. Members

9For a recent compendium of views on the irrationality of Japan’s decision, see Record (2009, 1-5).
of the bureaucracy, especially U.S. Assistant Secretary of State Dean Acheson, took great
discretion in interpreting this policy, the argument goes, deciding to issue no license at all
and imposing a de facto embargo on oil sales to Japan. When Roosevelt was made aware of
this development, after returning from his visit with Winston Churchill in Argentia, it was
too late to reverse the policy.

Taken together, these perspectives provide a rich account of the war. It still is not clear,
however, that the war was caused by the unintended consequences of high-level policies.
Japanese decision-makers hoped to avoid a war with the United States, proposing a summit
conference between Prime Minister Konoye and President Roosevelt and postponing the
deadline for peace negotiations. Yet they became increasingly convinced that war with the
United States was inevitable. At the Imperial Conference of July 2nd, the cabinet decided to
proceed with the Southern Advance, “no matter what obstacles may be encountered” (Ike,
1967, 78). As Prime Minister Konoye clarified: “In carrying out the plans outlined . . . we
will not be deterred by the possibility of being involved in a war with England and America,”
noting that “all plans, especially the use of armed forces, will be carried out in such a way
as to place no serious obstacles in the path of our basic military preparations for a war with

The Japanese government eventually reached the conclusion that it could not separate
the United States from its allies in the region. At the imperial conference of September
6th, 1941, Japan concluded that its policies were “mutually incompatible” with those of the
United States, so that the conflict “will ultimately lead to war” (Ike, 1967, 152). In its
missive to Washington D.C. on December 8th – the day after the Pearl Harbor attacks – the
emperor declared war “on the United States of America and the British Empire.” Whether
or not the cabinet debated the strategic consequences of a direct attack, it had endorsed a
war with the United States. The failure to anticipate the effect of an attack on Pearl Harbor
may help explain why Japan opted for this opening gambit, which may in turn account in
part for the outcome of the conflict. But it does not explain the initiation of war itself.
On the American side, the claim that FDR had lost control of policy is disputed by recent scholarship (Heinrichs, 1988, 141-142; Heinrichs, 1990, 165; Schn essler, 2010, 159; Trachtenberg, 2006, 99-100). It appears that Acheson was instructed by under-Secretary Sumner Welles to deny requests for oil while Roosevelt was meeting with Churchill (Heinrichs, 1990, 165). There is good reason to believe that Welles was conveying Roosevelt’s preferences. Roosevelt knew that the oil embargo may drive Japan to aggressive action, and he certainly considered the possibility of relaxing the embargo if necessary (see, e.g., Trachtenberg, 2006, 96, 98). A tough policy towards Japan would have made sense for FDR as a way to deter an attack on the USSR (Heinrichs, 1988, 1990) or provoke the Japanese as a back-door entry into a war with Nazi Germany (Trachtenberg, 2006; Schnessler, 2010; Copeland, 2013).

Yet if war was the result of deliberate actions, we would still want to understand why peace was not possible, given the cost and destruction of war. Perhaps civilian decisionmakers in Japan were fooled to buy into the “myth” of imperialism (Snyder, 1991), and perhaps they suffered from psychological biases and exaggerated the benefit of war, but it would be good to understand if there were structural conditions that made war particularly attractive, even if it was costly and destructive.

Our analysis is a first step in answering these questions. International conditions made Tokyo’s decision to go to war compelling. Japan was relatively weak and dependent on access to foreign resources that were to a great extent controlled by the United States. The economic system imposed by the United States in East Asia did not allow the country to grow peacefully. Japan needed access to markets, and the nearby markets would be relatively inexpensive to exploit, if the United States were defeated or coerced to disengage from the region. War could be attractive even if it was costly, because victory would allow Japan better to convert its economic resources into output.\(^{10}\)

\(^{10}\)Certainly, an explanation of the war in the Pacific would be incomplete without a proper understanding of the situation in Europe, since the United States perceived its main strategic threat to come from Nazi Germany. The two theatres were related and, we argue, war ultimately relied on the same fundamental friction: incompatible economic development paths.
5 Conclusion

This paper introduced a new framework for understanding the economic roots of hegemonic wars, shedding new light on the causes of World War II in Europe and Pacific. In short, Germany and Japan were highly dependent on the United States for their ability to grow and, despite their relative weakness, concluded that they could significantly improve their prospects for growth by challenging the United States militarily. We can use this framework to elucidate the general relationship between economic interdependence and hegemonic war, placing the case of World War II in comparative perspective. We look at three important cases that differ from the case of Germany and Japan in the 1930s in terms of the degree of economic dependence of the challenger and the cost of war (see Table 1 below).

<table>
<thead>
<tr>
<th>Economic Dependence of the Challenger</th>
<th>Cost of War</th>
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<tbody>
<tr>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>High</td>
<td>China-US, post-Cold War</td>
</tr>
<tr>
<td>Low</td>
<td>USSR-US, Cold War</td>
</tr>
<tr>
<td>Low</td>
<td>UK-US, late 19th century</td>
</tr>
</tbody>
</table>

Consider first the interaction between the United States and the United Kingdom in the 19th century (bottom right cell). These two countries found themselves in a strategic situation that was more conducive to peace than the cases of Germany and Japan in the 1930s. Both the United States and the United Kingdom possessed access to extensive markets for goods and resources, given their sizable home markets and the foreign markets (colonial or not) over which they extended their influence. As a result, defeating the United Kingdom would bring little improvement in the cost paid by the United States for converting resources into economic output, and peace prevailed.

Now consider the strategic interaction between the United States and the Soviet Union during the Cold War (bottom left cell). Both countries controlled significant markets for goods and resources. Fighting over additional markets would bring little difference in the cost
of converting resources into economic output. In addition, the nuclear revolution significantly increased the costs of war between the two countries, further undermining the possibility that war would break out. Despite their intense rivalry and competing ideologies, there were no underlying economic drivers for hegemonic war.

Finally, consider the current interaction between China and the United States (top left cell). China enjoys a large and growing domestic market but it is relatively more dependent on the United States’ hegemonic position for its growth than either the United States was dependent on the United Kingdom during the 19th century or the Soviet Union was dependent on the United States during the Cold War. This could present a problem for peace. The United States, however, has so far opted for maintaining an international order that facilitates the economic growth of any potential challenger, including China. Moreover, given the U.S.’s assured retaliatory nuclear capability, the costs of mounting a military challenge to the current international order are particularly high. As a result, there are no economic incentives for China to mount a military challenge to the United States in the foreseeable future (Monteiro, 2014).

At the same time, the relationship between China and the United States in the post-Cold War highlights two features of the contemporary international economy that contribute to solving, or at least attenuating, the hegemon’s commitment problem underpinning our mechanism producing hegemonic wars. First, today’s economic order is relatively open when compared with the regimes that regulated interaction between prior dyads of hegemon and challenger. China has access to any resources it needs for its economic development at international market prices. Second, international institution such as the World Trade Organization increase the cost the United States would pay for altering the structure of the international economy in ways that would be detrimental to Chinese economic growth. Furthermore, as China moves from an export-led growth model to a consumer-driven growth model, it may find itself rising more independently from the United States, further undermining the economic rationale for launching a hegemonic war. In sum, our theory hints at an alternative
explanation for the causes of great-power peace since the end of WWII based on the absence of an economic driver for hegemonic conflict.

6 Appendix

This Appendix has two sections. The first proves the formal statements in the main text and introduces, and proves, claims 1, 2, 3 announced in the text. It proceeds in the order in which the results are mentioned in the text. The second introduces an extension to the game-theoretic model presented in section 3 of the article.

6.1 The Two-Period Game

Proof. (Proof of proposition 1). Straightforward.

Claim 1 There exists \( \bar{k} > k(\omega^P) \) such that \( \forall k(\omega^W) \in (0, \bar{k}), -k(\omega^W)x^*_2(\omega^W) + S(x^*_2(\omega^W)) > -k(\omega^P)x^*_2(\omega^P) + S(x^*_2(\omega^P)) \).

Proof. By definition, \( x^*_2(\omega^W) \) maximizes \( -k(\omega^W)x_2(\omega^W) + S(x_2(\omega^W)) \) and this optimum is unique, given the strict concavity of \( S(x_t) \), so that the claim follows by continuity of the objective function with respect to \( k(\omega_t) \).

Claim 2 The minimum demand by the challenger \( z_1 \) and the maximum offer \( \bar{z}_1 \) by the hegemon are as follows:

\[
\begin{align*}
  z_1 &= p_1 S(x_1) - c_C + \delta \left[ p_1 U_{C,2}(\omega^W, V) + (1 - p_1) U_{C,2}(\omega^W, L) - U_{C,2}(\omega^P) \right] \quad (2) \\
  \bar{z}_1 &= p_1 S(x_1) + c_H - \delta \left[ p_1 U_{H,2}(\omega^W, L) + (1 - p_1) U_{H,2}(\omega^W, V) - U_{H,2}(\omega^P) \right] \quad (3)
\end{align*}
\]

where \( U_{i,t}(\omega^P) \) for the expected utility of country \( i \in \{C, H\} \) at the start of period \( t \) in the state of the world \( \omega = \omega^P \) and \( U_{i,t}(\omega^W, s) \) for the expected utility of country \( i \in \{C, H\} \) at the start of period \( t \) in the state of the world \( \omega = \omega^W \) and status \( s \in \{V, L\} \). Spelling out
the value of these expressions, we have
\[ U_{C,2}(\omega^P) = -k(\omega^P)x_1^*(\omega^P) + p_2S(x_2^*(\omega^P)) - c_C, \]
\[ U_{H,2}(\omega^P) = (1 - p_2)S(x_2^*(\omega^P)) + c_C, \]
\[ U_{i,2}(\omega^W, V) = -k(\omega^W)x_2^*(\omega^W) + S(x_2^*(\omega^W)) \],
\[ U_{i,2}(\omega^W, L) = 0. \]

**Proof.** Straightforward. ■

**Proof.** (Proof of Proposition 2). Follows from the above discussion. ■

**Claim 3** Assume that \( S(x_t) = \mathcal{S} \) for any \( x_t \), then we have that \( z_1 < \bar{z}_1 \) since \( c_C, \ c_H > 0 \).

**Proof.** Using \( S(x_t) = \mathcal{S} \), so that \( x_2^*(\omega^W) = x_2^*(\omega^P) = 0 \), we see that inequality (1) holds, since \( c_C, c_H > 0 \). ■

**Proof.** (Proof of Result 1). Consider inequality (1). a) is straightforward. b) and c) follow from the envelope theorem. d) follows from \( \frac{\partial -k(\omega^P)x_1^*(\omega^P)+S(x_2^*(\omega^P))}{\partial p_2} = [-k(\omega^P) + S'(x_2^*(\omega^P))] \frac{\partial x_2^*(\omega^P)}{\partial p_2} > 0 \) using the first-order condition \( -k(\omega^P) + p_2S'(x_2^*(\omega^P)) = 0 \) (and \( S''(x_2) > 0, S''(x_2) < 0 \) and the implicit function theorem). ■

### 6.2 Extension: The Three-Period Game

We now test the robustness of this conclusion to the length of the interaction between the two countries. Add a period 0, where each period follows the timing above and \( C \) becomes more powerful between each period, i.e. \( p_0 < p_1 < p_2 \). If \( C \) is growing more powerful between period 0 and period 1, and war could occur in period 1, perhaps \( C \) would wait to declare war until period 1. To answer this question, we characterize the conditions under which war becomes inevitable in period 0. Write \( \underline{z}_0 \) for the minimum demands that \( C \) is willing to accept and \( \overline{z}_0 \) for the minimum demands that \( H \) is willing to offer. We conclude that:

\[ \underline{z}_0 = p_0S(x_0) - c_C + \delta \left[ p_0U_{C,1}(\omega^W, V) + (1 - p_0)U_{C,1}(\omega^W, L) - U_{C,1}(\omega^P) \right] \]  \hspace{1cm} (4)

\[ \overline{z}_0 = p_0S(x_0) + c_H - \delta \left[ p_0U_{H,1}(\omega^W, L) + (1 - p_0)U_{H,1}(\omega^W, V) - U_{H,1}(\omega^P) \right] \]  \hspace{1cm} (5)

so that a bargaining range exists if and only if \( \underline{z}_0 \leq \overline{z}_0 \) or

\[ 42 \leq \overline{z}_0 \]
Clearly condition (8) is more difficult to satisfy than condition (1). A war in period 0 would allow the victor to choose the efficient allocation of resources in the next period. If peace is expected in period 1, we conclude that even though war is inevitable in period 1, when the bargaining range becomes empty. If we drop the time subscript \( x \) in this trade-off was favorable to war in period 1, it should also be favorable to war in period 0. There are two additional benefits of fighting war in period 0 that make it even more attractive than fighting in period 1. First, the efficiency gain of war is strictly greater in period 0 than in period 1. Since the inefficiency of peace decreases as \( p \)’s power increases, the efficiency gain yielded by war reaches its greatest value before \( C \)’s power rises.\(^{11}\) Second,

\[
c_C + c_H \geq \delta \left[ \{ U_{C,1} (\omega^W, V) + U_{H,1} (\omega^W, L) \} - \{ U_{C,1} (\omega^P) + U_{H,1} (\omega^P) \} \right]
\]

using \( U_{i,1} (\omega^W, V) = (1 + \delta) \left[ -k (\omega^W) x^* (\omega^W) + S (x^* (\omega^W)) \right] \), \( U_{i,2} (\omega^W, L) = 0 \). Note that the optimal value of investment after war is the same if chosen in periods 1 or 2, and hence we drop the time subscript \( x \) in this trade-off was favorable to war in period 1, it should also be favorable to war in period 0. There are two additional benefits of fighting war in period 0 that make it even more attractive than fighting in period 1. First, the efficiency gain of war is strictly greater in period 0 than in period 1. Since the inefficiency of peace decreases as \( C \)’s power increases, the efficiency gain yielded by war reaches its greatest value before \( C \)’s power rises.\(^{11}\) Second,

\[
(1 - \delta) [c_C + c_H] \geq \delta \left[ ( -k (\omega^W) x^* (\omega^W) + S (x^* (\omega^W))) - ( -k (\omega^P) x^*_1 (\omega^P) + S (x^*_1 (\omega^P))) \right]
\]

Inspecting this condition, we conclude that if the compatibility constraint fails in period 1, then it must also fail in period 0. The intuition is as follows. Fundamentally, deciding to go to war allows the victor to choose the efficient allocation of resources in the next period. If this trade-off was favorable to war in period 1, it should also be favorable to war in period 0. There are two additional benefits of fighting war in period 0 that make it even more attractive than fighting in period 1. First, the efficiency gain of war is strictly greater in period 1 than in period 2. Indeed, the greater is \( p \), the more effectively can \( C \) use the threat of war to extract a greater share of the surplus it creates, and the lower is the inefficiency of peace. Therefore, \( p_0 < p_1 \) implies that the efficiency gain of defeating the enemy is greater in period 0 than in period 1. Since the inefficiency of peace decreases as \( C \)’s power increases, the efficiency gain yielded by war reaches its greatest value before \( C \)’s power rises.\(^{11}\) Second,
a war in period 0 allows the states to avoid a future war. Therefore, the cost of war may be strictly greater and the compatibility constraint could still fail (this explains why the cost of war $c_C + c_H$ is multiplied by $1 - \delta$).

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to internalize the full benefit of its allocation of economic resources for two periods, not just one.


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