Supplementary Appendix for

Preventive War and Sovereign Debt

Contents

1 Lemma Proofs

This section contains proofs for Lemma 1, 2, 3, and 4.

1.1 Lemma 1

Proof. F prefers war to peace exactly when

$$\frac{1}{1-\beta}(1-s)-\kappa > 1+\frac{\beta}{1-\beta}-\beta\left[\frac{1}{1-\beta}\theta s-\kappa\right]$$

$$\frac{1}{\beta}(1-s)-\frac{1-\beta}{\beta}\kappa > \frac{1-\beta}{\beta}(1+\beta\kappa)+(1-\theta s)$$

$$1-s-\beta+\beta\theta s > (1-\beta)(1+(1+\beta)\kappa)$$

$$\beta\theta s > (1-\beta)(1+\beta)\kappa+s$$

$$\theta > \frac{1-\beta}{\beta s}(1+\beta)\kappa+\frac{1}{\beta}$$

□

1.2 Lemma 2

Proof. F prefers war to peace exactly when

$$\frac{1}{1-\beta}(1-s)-\kappa > 1+\frac{\beta}{1-\beta}+\beta\kappa-\rho\left(\frac{\beta}{1-\beta}\theta s\right)-(1-\rho)\left(\frac{\beta}{1-\beta}s\right)$$

$$\frac{1}{1-\beta}(1-s)-\kappa > 1+\frac{\beta}{1-\beta}+\beta\kappa-\frac{\beta}{1-\beta}\left[\rho\theta s+(1-\rho)s\right]$$

$$\frac{1}{\beta}(1-s) > 1+\left(\frac{1-\beta}{\beta}\right)(1+(1+\beta)\kappa)-s\left[\rho\theta+(1-\rho)\right]$$

$$\frac{1}{\beta}\left[1-s-\beta+\beta s(\rho\theta+1-\rho)\right] > \left(\frac{1-\beta}{\beta}\right)(1+(1+\beta)\kappa)$$

$$s\left[\beta(\rho\theta+1-\rho)-1\right] > (1-\beta)(1+\beta)\kappa$$

$$\beta\rho\theta > \frac{1-\beta}{s}(1+\beta)\kappa+1-\beta+\beta\rho$$

$$\beta\rho\theta > (1-\beta)\left(\frac{1+\beta}{s}\kappa+1\right)+\beta\rho$$

$$\theta > 1+\frac{1-\beta}{\beta\rho}\left(1+\frac{1+\beta}{s}\kappa\right)$$

$\square$

1.3 Lemma 3

Proof. F is indifferent between war and peace when

$$\frac{1}{1-\beta}(1-s)-\kappa = 1+\frac{\beta}{1-\beta}+\beta\kappa-\rho\left(\frac{\beta}{1-\beta}\theta s\right)-(1-\rho)\left(\frac{\beta}{1-\beta}s\right)+qB^*$$
$$\frac{1}{\beta}(1-s) = 1+\left(\frac{1-\beta}{\beta}\right)(1+(1+\beta)\kappa)-s\left[\rho\theta+(1-\rho)\right]+\frac{1-\beta}{\beta}qB^*$$
$$s\left[\beta\left(\rho\theta+1-\rho\right)-1\right] = (1-\beta)(1+\beta)\kappa+(1-\beta)qB^*$$
$$\beta\rho\theta = \frac{1-\beta}{s}(1+\beta)\kappa+1-\beta+\beta\rho+\frac{1-\beta}{s}qB^*$$
$$\theta-1-\frac{1-\beta}{\beta\rho}\left(1+\frac{1+\beta}{s}\kappa\right) = \frac{1-\beta}{s\beta\rho}qB^*$$
$$qB^* = \frac{s\beta\rho}{1-\beta}(\theta-1)-s\left(1+\frac{1+\beta}{s}\kappa\right)$$

$\square$

1.4 Lemma 4

Proof. H prefers war to borrowing exactly when

$$\frac{1}{1-\beta}s-\kappa>\beta\left[\rho\left(\frac{1}{1-\beta}\theta s-\kappa\right)+(1-\rho)\left(\frac{1}{1-\beta}s-\kappa\right)-s\left(1+r\right)\left[\frac{\beta\rho(\theta-1)}{1-\beta}-\left(1+\frac{1+\beta}{s}\kappa\right)\right]\right]$$

$$\frac{1}{1-\beta}s-\kappa>\beta\left[\rho\left(\frac{1}{1-\beta}\theta s\right)+(1-\rho)\left(\frac{1}{1-\beta}s\right)-\kappa-\frac{s\beta\rho}{1-\beta}\left(\theta-1\right)\left(1+r\right)+s\left(1+r\right)\left(1+\frac{1+\beta}{s}\kappa\right)\right]$$

$$\frac{s}{\beta}-\frac{1-\beta}{\beta}\kappa>\rho\theta s+(1-\rho)\,s-(1-\beta)\,\kappa-s\beta\rho\,(\theta-1)\,(1+r)+(1-\beta)\,(1+r)\,(s+(1+\beta)\,\kappa)$$

$$\frac{s}{\beta}-\frac{1-\beta}{\beta}\kappa>\rho\theta s\left[1-\beta\left(1+r\right)\right]+(1-\rho)\,s+s\beta\rho\,(1+r)+(1-\beta)\left[s\left(1+r\right)+(1+r+\beta+r\beta)\,\kappa-\kappa\right]$$

$$\frac{s}{\beta}-\frac{1-\beta}{\beta}\kappa-(1-\rho)\,s-s\beta\rho\,(1+r)-(1-\beta)\left[s\left(1+r\right)+(r+\beta+r\beta)\,\kappa\right]>\rho\theta s\left[1-\beta\left(1+r\right)\right]$$

$$s\left(\frac{1}{\beta}-1+\rho\right)-s\left(1+r\right)(1-\beta+\beta\rho)-\kappa\left(1-\beta\right)\left[r+\beta\left(1+r\right)+\frac{1}{\beta}\right]>\rho\theta s\left[1-\beta\left(1+r\right)\right]$$

$$\theta>\frac{1}{1-\beta(1+r)}\left[1+\frac{1-\beta}{\beta\rho}-\frac{1+r}{\rho}\left(1-\beta+\beta\rho\right)-\frac{\kappa}{s\rho}\left(1-\beta\right)\left[r+\beta\left(1+r\right)+\frac{1}{\beta}\right]\right]$$

$$\theta>\frac{1}{1-\beta(1+r)}\left[1-\beta\left(1+r\right)+\frac{1-\beta}{\beta\rho}\left[1-\beta\left(1+r\right)\right]-\frac{\kappa}{s\rho}\left(r-r\beta+\beta-\beta^2+r\beta-r\beta^2+\frac{1}{\beta}-1\right)\right]$$

$$\theta>1+\frac{1-\beta}{\beta\rho}-\frac{\kappa}{s\rho[1-\beta(1+r)]}\left[\beta\left(1-\beta\left(1+r\right)\right)+\frac{1}{\beta}\left(1-\beta\left(1-r\right)\right)\right]$$

$$\theta\rho>\rho+\frac{1-\beta}{\beta}-\frac{\kappa}{s}\left(\beta+\frac{1-\beta(1-r)}{\beta[1-\beta(1+r)]}\right)$$

Note that the sign changes in the middle of the solving since $\beta>\frac{1}{1+r}$. □

2 Strategic Lending with Inside Money

This section provides the necessary context and proof for Proposition 4.

Consider the following strategic game with many states. Suppose there are $N>1$ countries that interact at discrete times $t\in\{0,1,2,...\}$. All countries discount the future at a common rate $\delta\in(0,1)$ per period. The total amount of resources available for consumption in each period is $X>0$, and the amount controlled by country i (which may vary over time) is denoted x_i. In addition to its resource level, each country i is characterized by its current military strength, s_i. There is a finite set $\hat{S}=S\cup\{0\}$ of possible states, where an element s of $S=\{1,...K\}$, $K>1$ represents an active country's strength in war, and a country in state 0 is disarmed and becomes inactive. Let $\mathbf{s} \in \hat{S}^N$ denote a vector of military strengths for all countries, let $\boldsymbol{I}(\boldsymbol{s}) \equiv \{i : \ s_i \neq 0\}$ denote the set of active countries, and let $\boldsymbol{S}(n)$ denote the set of strength vectors where $n \leq N$ countries are active.

In each period, each active country can either choose transfers of resources to each other active country or initiate a war with any or all of the countries with which it shares a (undirected) link. Each node represents a country, and two countries can go to war with each other only if they share a link. The set of links is represented by $l \subseteq N^2$, with a typical element $ij \in l$ representing a link between country i and country j. Thus, a country can fight a directed war, but the set of countries that it can fight with may be limited. We assume that the network is *connected*—that is, there exists is a path of links between any two countries. (Connected actors are potential strategic lenders in the context of the current paper.) Let $\mathbf{L} \subseteq N^2$ denote the set of all possible connected networks with undirected links.

When a country starts a war with another country to which it is linked, the link has become *engaged* for that period. The term *general war* denotes the case where all active countries have an engaged link. In any period in which one or more countries choose war, consumption is 0 for all countries possessing an engaged link. In the absence of war, net transfers from i to j are labeled τ_{ij}, so that consumption in country i is

$$c_i = x_i - \sum_{j \in N \setminus i} \tau_{ij}.$$

We restrict transfers so that $c_i \geq 0$ for all i. The total payoff to a country that receives consumption stream $\{c_t\}_{t \geq 1}$ is

$$(1 - \delta) \sum_{t=1}^{\infty} \delta^{t-1} c_t.$$

Being disarmed ($s = 0$) is an absorbing state, and a disarmed country receives a continuation payoff of 0. When a country i becomes disarmed, all active countries with engaged links to i receive equal shares of i's resources x_i. Additionally, all active countries that have an engaged link with i at the time of its disarmament inherit all of i's links.

Resources for each country are specified by a nonnegative vector $\mathbf{x} = (x_1, \ldots, x_n)$, where $x_i > 0$ if country i is active, $x_i = 0$ if country i is disarmed, and $\sum_{i=1}^{N} x_i = X$. Let $\mathbb{X}(n)$ denote the set of such resource vectors where $n \leq N$ countries are active. If there are two or more active countries in a period, not all of them can be disarmed. (If all active countries transition to $s = 0$ in the same period, then one is randomly selected to remain active, and the others are disarmed.) If and when a single country remains, the game ends, and the survivor receives the entire stream of available consumption $(1-\delta)\sum_{t=1}^{\infty} \delta^{t-1} X = X$.

Let $\gamma(s'; c, s)$ denote the probability that a country in state $s \in S$ that consumes c will transition to state $s' \in S$. A country in state 1, the weakest military position, may become disarmed in a period in which war occurs. Let $\gamma^W(s'; s)$ denote the probability that a country transitions from s to s' after a period of war. State transitions are independent across countries. The following assumptions on transition probabilities are maintained throughout:

Assumption (A)**.**

1. *One step at a time with full support: there exists* $\underline{\gamma} > 0$ *such that for all* $c \in [0, X]$
   (a) *for all* $1 < s \leq K$*,* $\gamma(s'; c, s) \geq \underline{\gamma}$ *for all* $s' \in \{s-1, s, s+1\} \cap S$ *and* $\gamma(s'; c, s) = 0$ *for all other* s'*, and*
   (b) $\gamma(s'; c, 1) \geq \underline{\gamma}$ for $s' \in \{1, 2\}$.
2. *War is necessary for disarmament:*
   (a) $\gamma(0; c, 1) = 0$.
3. *War transitions:*
   (a) $\gamma^W(s'; s) = 0$ *unless* $s' \in \{s-1, s, s+1\}$*,*
   (b) $\gamma^W(0; 1) > 0$*, and*
   (c) $\gamma^W(s'; s) \geq \gamma(s'; c, s)$ *if* $s' < s$ *and* $\gamma^W(s'; s) \leq \gamma(s'; c, s)$ *if* $s' > s$.

We also make the following assumption:

Assumption (B)**.** *Either the number of military strength states K is at least 3 or the network is complete.*

Transfers and war decisions are publicly observed, as are military strengths and resource levels.

2.1 Proposition 4

Proof. Without "loans" Krainin and Wiseman (2016) demonstrate the following theorem:

Theorem 1. *In the baseline model, there exists $\underline{\delta} < 1$ such that the following holds: for any $\delta \geq \underline{\delta}$ and any initial military strength vector $\boldsymbol{s} \in \hat{S}^N$, network $l \in \mathbf{L}$, and resource vector $\mathbf{x} \in \mathbb{X}(N)$, in any SPE war occurs, and eventually only a single country remains active.*

How do loans affect this conclusion?

In the main paper we assume that countries have (1) full commitment to repay loans, (2) a source of outside money, and (3) loans are made by a nonstrategic actor. In the current extension, we are interested in the case where many strategically-connected (linked) countries might loan each other inside money in order to avoid preventive war.

The first thing to note is that there is nothing in the dynamic network model of bargaining that rules out states lending each other resources to make transfers. Theorem 1 applies to this possibility. Nevertheless, Theorem 1 assumes a particular notion of the commitment technology to loans: there is no way to commit to not going to war in the future, therefore there is no way to commit to repaying loans that imply a game value less than the minmax achieved through war in any given period.

To make it as hard as possible to demonstrate that preventive war still occurs with loans in the main body of the text, we made assumption (1), complete commitment to repay a loan. That is, the setup is implicitly partial equilibrium. Countries are willing to repay loans that violate their minmax within the game we study, because there is implicitly some other source of value in the game. Does this assumption still make sense in the current context? In other words, could a country be better off paying back a loan today that it received in the past, even if it violates their current minmax condition? The answer is "no." By only considering inside money made by strategically involved actors, there is no other source of value which players can lose out on if they violate the terms of their loan.

Imagine this were not the case. One can show that certain states are achieved where some country, say country 1, achieves a minmax value greater than an even split of all the resources [the probability of victory in that state times the total resources, $\alpha_i(\mathbf{s}^i)X$ is greater than X/N]. Definitionally, this value cannot be brought lower by any punishment strategy other countries may enact. Therefore, if country 1 chooses to continue to repay the loan in such a state, it must be that 1's expected return to this strategy is greater than or equal to the minmax value achieved through war. Call this value $Z_i(\mathbf{s}^i) \geq \alpha_i(\mathbf{s}^i)X$ where the inequality follows from the argument above.

Therefore, 1 achieves a value greater than the even split of all resources in this state since $Z_i(\mathbf{s}^i) \geq \alpha_i(\mathbf{s}^i)X > X/N$. For such states, replace $\alpha_i(\mathbf{s}^i)X$ with $Z_i(\mathbf{s}^i)$ in the proof of Theorem 1 and the proof goes through as before.

Since Proposition 4 is a direct corollary of Theorem 1 with loans, we have demonstrated the proposition. $\square$

3 Supplementary Tables and Figures for Empirical Implications

Table A1 reports the results of our replication of Lemke's (2003) analysis with directed dyads. Models (1), (2), (3), and (4) below correspond to models (1a), (1b), (2a), and (2b) from Table 2 in Lemke's paper, respectively. Note that we report the unadjusted constant here.

Table A1: Replication of Lemke (2003)'s Logistic Regressions with Directed Dyads

	(1)	(2)	(3)	(4)
Allies	-0.602^{**}	-0.600^{**}	-2.230^{***}	-2.276^{***}
	(0.302)	(0.300)	(0.597)	(0.633)
Contiguity	0.408	0.418	1.951^{***}	1.949^{***}
	(0.262)	(0.262)	(0.397)	(0.404)
Dem Initiator	−0.141	−0.151	−0.403	−0.306
	(0.235)	(0.232)	(0.425)	(0.425)
Rivals	2.049^{***}	2.079^{***}	2.472^{***}	2.449^{***}
	(0.476)	(0.485)	(0.563)	(0.560)
Parity	2.799^{***}	2.788^{***}	2.669^{***}	2.740^{***}
	(0.508)	(0.508)	(0.790)	(0.818)
PM	36.569	46.440^{**}	147.815	13.814
	(32.263)	(21.070)	(113.529)	(47.746)
PM×Allies	40.919	−13.517	−222.134	-163.783^{**}
	(75.630)	(32.185)	(146.469)	(69.738)
PM×Contiguity	−16.921	-42.959^{**}	−22.697	73.658
	(39.843)	(21.482)	(114.523)	(58.227)
PM×Dem Initiator	25.484	−8.469	-239.044^{**}	-136.408^{**}
	(60.173)	(19.402)	(120.341)	(63.123)
PM×Rivals	-212.365^{**}	-88.293^{**}	-407.617^{***}	-134.994^{**}
	(93.472)	(38.221)	(141.885)	(63.365)
Constant	-0.755^{***}	-0.748^{***}	-2.442^{***}	-2.551^{***}
	(0.157)	(0.158)	(0.284)	(0.294)
Power	Overall	Military	Overall	Military
Cases	All	All	Originator	Originator
Observations	495	494	329	328
Log Likelihood	−285.480	−284.114	−110.766	−108.233
Akaike Inf. Crit.	592.961	590.229	243.532	238.466

Note: *p<0.1; **p<0.05; ***p<0.01

Table A2 reports the results of our replication of Lemke's (2003) analysis with nondirected dyads. Models (1), (2), (3), and (4) below correspond to models (1a), (1b), (2a), and (2b) from Table 3 in Lemke's paper, respectively. Note that we report the unadjusted constant here.

Table A2: Replication of Lemke (2003)'s Logistic Regressions with Nondirected Dyads

	(1)	(2)	(3)	(4)
Allies	-0.281	0.003	-2.223^{***}	-1.753^{***}
	(0.342)	(0.341)	(0.677)	(0.666)
Contiguity	0.427	0.284	2.004^{***}	1.759^{***}
	(0.297)	(0.302)	(0.438)	(0.448)
Rivals	1.934^{***}	2.199^{***}	2.774^{***}	2.805^{***}
	(0.506)	(0.548)	(0.651)	(0.650)
Parity	2.397^{***}	2.457^{***}	2.103^{**}	2.109^{**}
	(0.531)	(0.519)	(0.844)	(0.837)
PM	78.607^{*}	57.073^{**}	-13.830	-9.961
	(47.216)	(24.770)	(101.534)	(50.479)
PM×Allies	-79.906	-98.084^{**}	135.463	-7.449
	(76.704)	(38.687)	(119.538)	(55.461)
PM×Contiguity	-30.562	8.198	28.302	52.491
	(60.407)	(36.883)	(103.086)	(55.468)
PM×Rivals	-0.232	-48.763	-104.927	-43.458
	(89.179)	(46.892)	(117.337)	(52.070)
Constant	-0.873^{***}	-0.930^{***}	-2.524^{***}	-2.510^{***}
	(0.145)	(0.148)	(0.283)	(0.280)
Power	Overall	Military	Overall	Military
Cases	All	All	Originator	Originator
Observations	495	494	329	328
Log Likelihood	-286.843	-281.398	-117.514	-116.353
Akaike Inf. Crit.	591.685	580.796	253.029	250.706

Note: *p<0.1; **p<0.05; ***p<0.01

Table A3 reports results that correspond to those in Table 2 of the main text with the exception that the operative Rate variable is the unadjusted U.K. long-term consol yield.

Table A3: Logistic Regressions on War with Consol Yields

	(1)	(2)	(3)	(4)	(5)	(6)
PM	-49.061^{*}	-31.403^{**}	1.900	17.883	-19.241	-31.575^{*}
	(28.852)	(14.390)	(67.059)	(31.677)	(43.952)	(16.537)
Rate	-0.236^{***}	-0.241^{***}	-0.286^{***}	-0.271^{***}	-0.302^{***}	-0.312^{***}
	(0.034)	(0.034)	(0.043)	(0.041)	(0.042)	(0.043)
PM×Rate	17.553^{**}	10.533^{***}	27.303^{**}	11.131^{**}	11.652	9.862^{**}
	(7.201)	(3.716)	(11.835)	(5.592)	(8.168)	(4.018)
Constant	-4.393^{***}	-4.377^{***}	-4.432^{***}	-4.518^{***}	-5.007^{***}	-4.959^{***}
	(0.192)	(0.192)	(0.233)	(0.225)	(0.228)	(0.232)
			Average Marginal Effects			
PM	-0.209	-0.134^{**}	0.013	0.101	-0.303	-0.499^{*}
	(0.144)	(0.058)	(0.465)	(0.166)	(0.826)	(0.263)
Rate	-0.001^{***}	-0.001^{***}	-0.002^{***}	-0.002^{***}	-0.005^{***}	-0.005^{***}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
PM×Rate	0.075^{*}	0.045^{**}	0.181^{**}	0.063^{*}	0.183	0.156^{**}
	(0.041)	(0.017)	(0.086)	(0.033)	(0.192)	(0.079)
Dyads	Directed	Directed	Nondirected	Nondirected	Directed	Directed
Power	Overall	Military	Overall	Military	Overall	Military
Lemke Controls	No	No	No	No	Yes	Yes
Observations	495	494	495	494	495	494
Log Likelihood	-310.530	-308.807	-296.838	-296.413	-252.598	-251.212
Akaike Inf. Crit.	629.059	625.614	601.675	600.826	523.195	520.424

Note: The preventive motive (PM) estimate that is operative in each model is described by the Dyads and Power rows. The Dyads row indicates whether the estimate was recovered using dyads where the initiator is in relative decline (Directed) or where either dyad member is in relative decline (Nondirected). The Power row indicates whether the estimate was recovered using COW's composite capabilities index (Overall) or only the military components of the COW capabilities measure (Military). The Lemke Controls row indicates if the model includes the control variables from Lemke (2003), which are indicator variables for whether the initiator is a democracy and whether dyads are allied, contiguous, or rivals. Unlike the corresponding table presented in the main text, here the unadjusted U.K. long-term consol yield serves as the Rate variable. Standard errors are in parentheses. Coefficients that are significantly different from zero are denoted by the following system: *10%,**5%,***1% for the two-tailed test.

Table A4 provides results for a logistic regression on war that includes not only Lemke's (2003) control variables (as in models (5) and (6) in Table 2 of the main text), but also interactions of these control variables with the preventive motive estimate. Lemke's overall measure is operative in model (1) while the military measure is operative in model (2). The Rate variable operative in each model is the unadjusted U.K. long-term consol yield.

Table A4: Logistic Regressions on War with Lemke (2003) Interactions

	(1)	(2)
Allies	−0.287	−0.234
	(0.319)	(0.324)
Contiguity	0.544*	0.559*
	(0.286)	(0.288)
Dem Initiator	0.048	0.068
	(0.258)	(0.258)
Rivals	2.638***	2.927***
	(0.558)	(0.585)
Parity	2.954***	2.973***
	(0.557)	(0.573)
Rate	−0.307***	−0.352***
	(0.043)	(0.048)
PM	−9.148	−13.410
	(59.233)	(31.295)
PM×Allies	13.403	−76.386*
	(85.993)	(43.718)
PM×Contiguity	−14.038	−46.090**
	(43.667)	(22.798)
PM×Dem Initiator	56.056	−40.927*
	(80.291)	(23.370)
PM×Rivals	−247.686**	−144.660***
	(112.411)	(41.247)
PM×Rate	11.522	18.960***
	(11.590)	(6.057)
Constant	0.637***	0.804***
	(0.236)	(0.245)
Dyads	Directed	Directed
Power	Overall	Military
Observations	495	494
Log Likelihood	−249.540	−241.738
Akaike Inf. Crit.	525.080	509.475
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table A5 provides results of six linear probability models. These models correspond to the six models in Table 2 in the main text, but as linear probability models instead of logistic regressions and with the Rate variable as the unadjusted U.K. long-term consol yield.

Table A5: Linear Probability Models with Consol Yields

	(1)	(2)	(3)	(4)	(5)	(6)
PM	-7.978	-5.924^{**}	-15.909^{***}	-7.733^{**}	-6.239	-5.380^{**}
	(5.294)	(2.814)	(5.732)	(3.051)	(4.807)	(2.552)
Rate	-0.050^{***}	-0.051^{***}	-0.060^{***}	-0.059^{***}	-0.048^{***}	-0.050^{***}
	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)
PM×Rate	2.996^{**}	2.014^{***}	6.436^{***}	3.149^{***}	2.298^{*}	1.679^{**}
	(1.327)	(0.715)	(1.484)	(0.799)	(1.206)	(0.654)
Constant	0.771^{***}	0.778^{***}	0.789^{***}	0.784^{***}	0.593^{***}	0.601^{***}
	(0.041)	(0.041)	(0.042)	(0.042)	(0.043)	(0.043)
Dyads	Directed	Directed	Nondirected	Nondirected	Directed	Directed
Power	Overall	Military	Overall	Military	Overall	Military
Lemke Controls	No	No	No	No	Yes	Yes
Observations	495	494	495	494	495	494
R^2	0.120	0.125	0.158	0.152	0.298	0.300
Adjusted R^2	0.115	0.120	0.152	0.147	0.286	0.289
Residual Std. Error	0.471	0.470	0.461	0.462	0.423	0.422
	(df = 491)	(df = 490)	(df = 491)	(df = 490)	(df = 486)	(df = 485)
F Statistic	22.362^{***}	23.367^{***}	30.622^{***}	29.313^{***}	25.734^{***}	26.012^{***}
	(df = 3; 491)	(df = 3; 490)	(df = 3; 491)	(df = 3; 490)	(df = 8; 486)	(df = 8; 485)

Note: *p<0.1; **p<0.05; ***p<0.01

Table A6 provides results of six linear probability models. These models correspond to the six models in Table 2 in the main text, but as linear probability models instead of logistic regressions. The Rate variable is the real long rate provided by the Bank of England.

Table A6: Linear Probability Models with Real Rate

	(1)	(2)	(3)	(4)	(5)	(6)
PM	0.904	−1.075	8.042***	4.396**	1.407	−0.992
	(2.608)	(1.584)	(2.775)	(1.753)	(2.413)	(1.470)
Rate	−0.061***	−0.060***	−0.059***	−0.059***	−0.053***	−0.053***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)
PM×Rate	1.523**	1.093***	0.001	−0.115	0.873	0.797**
	(0.669)	(0.406)	(0.712)	(0.450)	(0.618)	(0.375)
Constant	0.555***	0.554***	0.536***	0.535***	0.394***	0.393***
	(0.022)	(0.022)	(0.023)	(0.024)	(0.031)	(0.031)
Observations	495	494	495	494	495	494
R^2	0.165	0.167	0.171	0.171	0.307	0.308
Adjusted R^2	0.159	0.162	0.166	0.166	0.295	0.296
Residual Std. Error	0.459	0.458	0.457	0.457	0.420	0.420
	(df = 491)	(df = 490)	(df = 491)	(df = 490)	(df = 486)	(df = 485)
F Statistic	32.226***	32.700***	33.818***	33.738***	26.876***	26.935***
	(df = 3; 491)	(df = 3; 490)	(df = 3; 491)	(df = 3; 490)	(df = 8; 486)	(df = 8; 485)

Note: *p<0.1; **p<0.05; ***p<0.01

We provide a series of results that use Bell and Johnson's measure from their *ISQ* (2015) article. We note that this measure is missing about 20% of war onsets and the dynamic panel model with fixed effects is an inconsistent estimator even as n gets large. Our exploratory analysis of a bias-corrected estimator for their "future power" variable gave similar results, so here we report the findings with the Bell and Johnson measure as published.

Table A7 reports the results of Bell and Johnson's (2015) analysis. Models (1), (2), (3), and (4) below correspond to models (1), (2), (3), and (4) from Table 2 in Bell and Johnson's paper, respectively. Columns (3) and (4) are comparable to our results for Lemke in the manuscript, including all war onsets.

Table A7: Replication of Bell and Johnson's (2015) Rare Events Logit

	(1)	(2)	(3)	(4)
Expected Shift in Power	2.80***	1.45*	3.41***	2.43***
	(0.77)	(0.78)	(0.42)	(0.45)
Capital-to-Capital Distance		−0.45***		−0.51***
		(0.09)		(0.06)
Contiguity		2.38***		1.39***
		(0.29)		(0.18)
Joint Democracy		−2.02**		−3.02***
		(1.01)		(1.00)
Similarity in Foreign Policy Interests		−1.34**		−1.88***
		(0.56)		(0.30)
Peace Years		−0.21***		−0.12***
		(0.03)		(0.01)
(Peace Years)^2		0.00***		0.00***
		(0.00)		(0.00)
(Peace Years)^2		−0.00***		−0.00***
		(0.00)		(0.00)
Constant	−9.33***	−3.56***	−8.32***	−1.78***
	(0.10)	(0.91)	(0.06)	(0.56)
AIC	2098.61	1616.38	5332.27	4596.58
BIC	2122.51	1723.11	5356.17	4703.31
Log Likelihood	−1047.30	−799.19	−2664.14	−2289.29
Deviance	2094.61	1598.38	5328.27	4578.58
Num. obs.	1144582	1044534	1144582	1044534

Note: This table follows the system *p<0.1; **p<0.05; ***p<0.01

Table A8 provides the results for four rare events logistic regression models that correspond to the four models in Table A7 with the inclusion of an interaction between Bell and Johnson's preventive motive estimate (Expected Shift in Power) and unadjusted U.K. long-term consol yields (Rate).

Table A8: Rare Events Logistic Regression on War with Consol Yields

	(1)	(2)	(3)	(4)
Expected Shift in Power	0.52	-0.62	1.97^{**}	1.40
	(1.70)	(1.60)	(0.98)	(1.02)
Rate	-0.30^{***}	-0.19^{***}	-0.40^{***}	-0.31^{***}
	(0.04)	(0.04)	(0.03)	(0.03)
(Expected Shift in Power)×Rate	0.40	0.39	0.27	0.22
	(0.25)	(0.25)	(0.17)	(0.18)
Capital-to-Capital Distance		-0.47^{***}		-0.48^{***}
		(0.10)		(0.06)
Contiguity		2.22^{***}		1.21^{***}
		(0.29)		(0.18)
Joint Democracy		-1.95^{*}		-2.90^{***}
		(1.01)		(1.00)
Similarity in Foreign Policy Interests		-0.88		-1.33^{***}
		(0.56)		(0.29)
Peace Years		-0.21^{***}		-0.10^{***}
		(0.03)		(0.01)
(Peace Years)^2		0.00^{***}		0.00^{***}
		(0.00)		(0.00)
(Peace Years)^3		-0.00^{***}		-0.00^{***}
		(0.00)		(0.00)
Constant	-7.43^{***}	-2.60^{***}	-5.96^{***}	-0.65
	(0.23)	(0.94)	(0.15)	(0.57)
AIC	2031.68	1594.35	5036.81	4431.70
BIC	2079.48	1724.80	5084.61	4562.15
Log Likelihood	-1011.84	-786.17	-2514.41	-2204.85
Deviance	2023.68	1572.35	5028.81	4409.70
Num. obs.	1144582	1044534	1144582	1044534

Note: This table follows the system *p<0.1; **p<0.05; ***p<0.01

Table A9 provides the results for four rare events logistic regression models that correspond to the four models in Table A7 with the inclusion of an interaction between Bell and Johnson's preventive motive estimate (Expected Shift in Power) and the real long rate provided by the Bank of England (Rate).

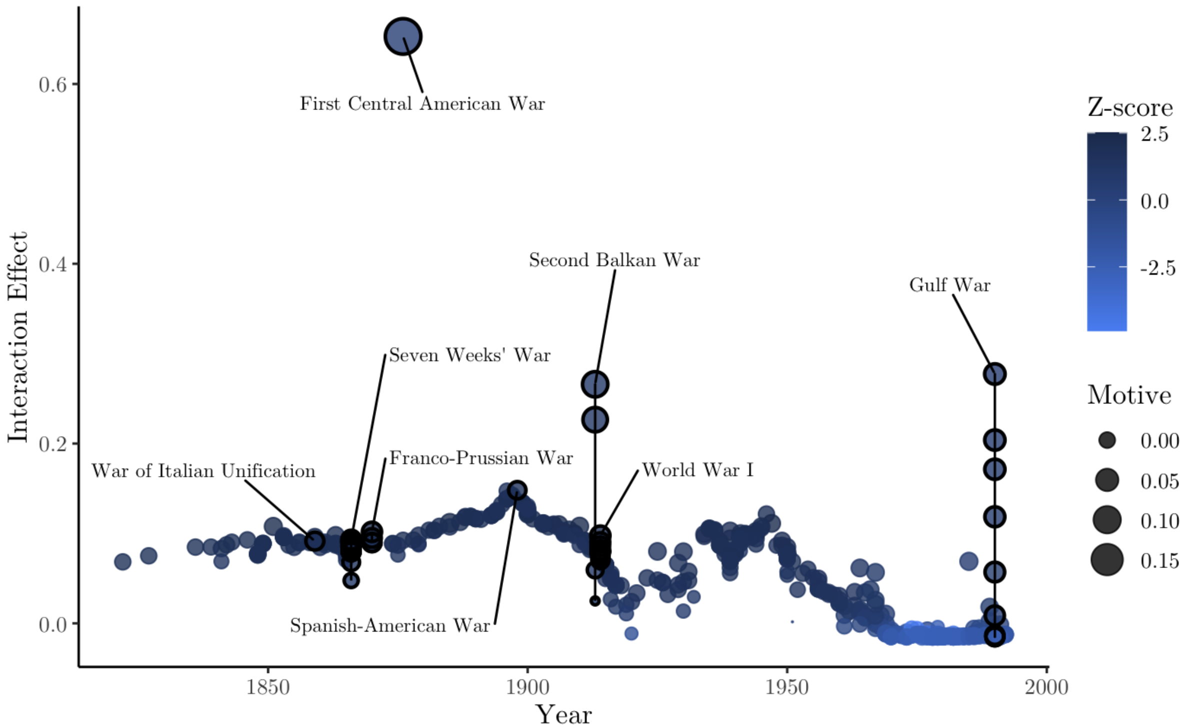
Table A9: Rare Events Logistic Regression on War with Real Long Rates

	(1)	(2)	(3)	(4)
Expected Shift in Power	2.80^{***}	1.45	2.69^{***}	2.06^{***}
	(0.80)	(0.89)	(0.42)	(0.43)
Rate	-0.09^{**}	0.00	-0.39^{***}	-0.34^{***}
	(0.04)	(0.04)	(0.02)	(0.02)
(Expected Shift in Power)×Rate	-0.16	0.02	0.25^{*}	0.25^{*}
	(0.25)	(0.27)	(0.15)	(0.14)
Capital-to-Capital Distance		-0.45^{***}		-0.57^{***}
		(0.09)		(0.06)
Contiguity		2.38^{***}		1.32^{***}
		(0.29)		(0.18)
Joint Democracy		-2.01^{**}		-2.90^{***}
		(1.01)		(1.00)
Similarity in Foreign Policy Interests		-1.34^{**}		-1.58^{***}
		(0.56)		(0.31)
Peace Years		-0.21^{***}		-0.09^{***}
		(0.03)		(0.01)
(Peace Years)^2		0.00^{***}		0.00^{***}
		(0.00)		(0.00)
(Peace Years)^3		-0.00^{***}		-0.00^{***}
		(0.00)		(0.00)
Constant	-9.11^{***}	-3.56^{***}	-7.80^{***}	-1.39^{**}
	(0.13)	(0.91)	(0.06)	(0.59)
AIC	2096.44	1620.35	5002.72	4361.80
BIC	2144.25	1750.80	5050.52	4492.25
Log Likelihood	-1044.22	-799.18	-2497.36	-2169.90
Deviance	2088.44	1598.35	4994.72	4339.80
Num. obs.	1144582	1044534	1144582	1044534

Note: This table follows the system *p<0.1; **p<0.05; ***p<0.01

Figure A1 provides the observation-level interaction effects of Model (1) of Table A3, which corresponds to the figure in the main text but with the unadjusted U.K. long-term consol yield as the operative Rate variable.

Figure A1: Interaction Effects Over Time



Note: Each point depicts an observation-specific interaction effect, with size according to the strength of the preventive motive and color reflecting the observation-specific z-score. The interaction effects displayed here correspond to a model that uses Lemke's (2003) measure of preventive motive that was recovered with directed dyads and COW's composite capabilities index, the unadjusted consol yield, and no additional controls.