International Power Rankings: Theory and Evidence from International Cooperation*

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Abstract

Throughout history, powerful countries have used their coercive resources to obtain favorable policies from other countries (geopolitical rents). This paper proposes and tests a theory of geopolitical competition, studying how geopolitical rents depend on the power of all competing countries. Our theory shows that the equilibrium geopolitical rent obtained by a country is not just determined by its power or relative power, but rather by its *Weaker Powers Index (WPI)*, i.e., the combined share of power held by all weaker competitors. Specifically, higher WPI implies higher rent. Specializing the theory, we show that when the WPI of a country increases, it should trade more, conclude more economic and military deals, have better diplomatic and political relations, and send more aid. In our empirical analysis, we confirm these predictions using bilateral data on international interactions and trade. Finally, we show that the theory can accurately predict the effect of the rise of China and the collapse of the Soviet Union on the United States and other major powers and shed light on various puzzles of international relations, including the Thucydides Trap.

Keywords: Geopolitical Competition, International Cooperation, Power Rankings, International Interdependence, Thucydides Trap, Rise of China

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1 Introduction

The great-power competition between the United States and China has recently gained a central role in the political debate. How does the rise of China affect the global interests of the United States? How will the rivalry between China and the United States shape the pattern of international cooperation? While geopolitical competition on a global scale has few precedents in history, the concept itself is certainly not new. Indeed, powerful countries have always used their coercive resources to advance their competing foreign interests, obtaining different *geopolitical rents* from the other countries, e.g. tributes, economic concessions, military bases, trading posts, political alignment. This paper proposes and tests a theory of geopolitical competition, studying how a country's geopolitical rents depend on its coercive resources and those of its competitors.

A natural starting point for such a theory is that stronger countries obtain larger geopolitical rents. However, a closer look at the evidence reveals a much more complicated pattern. Consider, for instance, how the collapse of the Soviet Union affected the relations between the United States and other countries. In Eastern Europe, the US took advantage of the fall of the previously dominant power by extending its network of alliances (Shifrinson, 2020). Instead, in Latin America, where the US was the dominant power, the same event led to the rise of leftist governments and an overall reduction in the extent of alignment with the United States (Levitsky and Roberts, 2011). Another puzzling example is Thucydides Trap, the historical regularity whereby major powers become bitter rivals when they reach similar power levels (Allison, 2017). The latest example of this pattern is the souring of US-China relations. While the United States facilitated the rise of China in the early 2000s, it now views China as a threat to its global interests. A final puzzle is that leaders of major powers often appear to focus more on the power of their competitors than on their own. Paradoxically, they appear willing to weaken themselves (e.g., with a destructive conflict) only to become stronger than another major power (Renshon, 2017).

Motivated by these examples, we develop a new theoretical framework where the equilibrium payoff (the sum of all geopolitical rents) of each country is not determined by its relative power, but by the power share of all weaker competitors: a variable we call the *Weaker Powers Index (WPI)*. Specifically, higher WPI implies higher payoff. This simple prediction produces rich enough dynamics to resolve the earlier puzzles. First, the reduction in power of a major power (like the collapse of the Soviet Union) has a positive effect on every weaker competitor (like the US in Eastern Europe) but hurts every stronger one (like the US in Latin America). Second, in line with the US-China example, incumbents have a material interest in assisting the rise of a weaker competitor. Still, this benevolent

attitude would suddenly stop when the rising power reaches a similar level of power as the incumbent, as any further change might change their relative ranking. Indeed, within our theory, any reduction in a country's power rank is highly undesirable as it induces a jump down in its WPI, thus equilibrium payoff. Finally, dependence on the WPI implies that the equilibrium payoff of every major power is decreasing in its own power, for fixed power rank. Thus, it should not strike as a surprise if major powers are willing to waste some of their resources (thus becoming weaker) to become stronger than a competitor. Importantly, all these non-monotonic comparative statics are summarized by the dependence on the Weaker Powers Index (WPI): the key variable for our empirical analysis.

Specializing the theory, we predict that when a country's WPI increases, it should have better economic, military, and diplomatic relations, send more economic, military, and humanitarian aid, and export and import more. We confirm the empirical validity of each of these predictions by testing them with bilateral data on international interactions and trade. Additionally, we show that the WPI plays a much more fundamental role than a country's own power. Indeed, controlling for a country's WPI, the estimated effect of a country's power becomes insignificant or even negative. Moreover, consistently with the theory, we show that the fall of the Soviet Union hurt the United States (and the average major power) where it was weaker than the USSR relative to where it was stronger. Additionally, we show that the United States (and the average major power) has been benefiting from the rise of China where it is stronger than China relative to where it is weaker. All in all, this empirical analysis strongly supports the theory and the role of the WPI in shaping modern international relations.

To understand how power determines the geopolitical rents obtained by each major power from any given country, we study a model where a local ruler (*policymaker*) tries to increase its chances of political survival by obtaining the support of a set of major powers (*coercers*), who are heterogeneous in a commonly known characteristic (*power*). An example of a policymaker can be the Egyptian President Nasser at the beginning of the Cold War, managing its relations with the United States, the Soviet Union, and Great Britain (the coercers).

We model the geopolitical rent that each coercer obtains from the policymaker in a stylized way. We assume that the policymaker offers a vector of *transfers* that are paid only to supporting coercers, and if and only if the policymaker survives. Upon observing these offers, coercers simultaneously choose whether to support or oppose the policymaker (i.e., accept the transfer or get an outside option). These decisions determine the probability of the policymaker's survival, which is an increasing function of the share of (total) power of all coercers that support the policymaker. As transfers are received only when the policymaker survives, this setting features strategic complementarities: the incentive to support

the policymaker increases in the power of supporting coercers. In our previous example, this means that the incentive for Great Britain to oppose Nasser is lower when it expects both the United States and the Soviet Union to support him. Arguably, this type of interdependence captures an important dimension of geopolitical competition. For instance, Great Britain could do little against Nasser's nationalization of the Suez Canal in 1956 (a reduction in its transfer to Great Britain), as he had the support of the Soviet Union and the United States.

The main result of our theory is that the equilibrium[1] transfer received by every coercer depends on power only via its *Weaker Powers Index (WPI)*, i.e., the combined share of total power of all weaker coercers. The key theoretical driver of this result are the strategic complementarities: by ensuring the support of a coercer, the policymaker can reduce the transfer to another coercer. Indeed, we show that the policymaker optimally offers to the strongest coercer a transfer so high that it ensures its support, even if no other coercer were to support the policymaker. With the strongest on its side, the policymaker can ensure the support of the second-strongest with a smaller offer: just enough to compensate for the possibility that no coercer, except the strongest, supports the policymaker. Iterating this reasoning, we find that transfers must ensure the support of a coercer when all stronger coercers support the policymaker, and the weaker ones do not. As a result, a coercer's transfer is an increasing function of the power share of all weaker coercers, the WPI.

The first implication of our main result is that the transfer from the policymaker to a coercer depends on the power of third parties. Specifically, as in our previous example, a reduction in the power of a coercer (e.g., the fall of the Soviet Union) should negatively affect stronger coercers and positively affect weaker ones.[2] As a simple application of this idea, note that, in our model, the most powerful coercer (the hegemon) is hurt[3] by any weakening of the other coercers. Thus, it has a material interest in mediating and avoiding conflicts among major powers and providing public goods that can allow others to prosper. In line with Hegemonic Stability Theory (Webb and Krasner, 1989), this discussion suggests that periods of undisputed hegemony should be peaceful and prosperous.

The second implication of our main result is the non-monotonic relation between a coercer's equilibrium transfer and its power: it decreases as the power share increases, but it jumps up whenever the power rank increases. This idea can explain the changing nature of US-China relations: any benevolent attitude of the hegemon towards a rising power will only

[1]Note that the policymaker's offer will typically be compatible with multiple subgame perfect equilibria. In line with a literature in mechanism design, we address this by assuming a robustness refinement (unique implementation of support) that selects (almost) one equilibrium (Segal, 1999, 2003; Winter, 2004).

[2]This is consistent with the idea that the United States (a coercer) can be affected in opposite ways in different regions (i.e., relative to different policymakers) by an event such as the collapse of the Soviet Union, depending on whether it was stronger or weaker than the USSR in that region.

[3]In the sense that its relations with any policymaker would deteriorate (become less profitable).

last as long as it does not pose a challenge to its power rank. More generally, the relation between power ranks and payoffs can explain why tensions often build between two countries that reach similar power levels (Thucydides Trap). Additionally, it can explain why countries might be willing to fight when they perceive that their status is at stake (Renshon, 2017). Our model offers a natural framework to study these famous historical patterns, which are particularly relevant in today's geopolitical environment (Allison, 2017).

To empirically test the theory, we expand the model allowing for multiple policymakers dealing with multiple coercers over multiple periods. Our empirical analysis is based on modern bilateral data where the observation unit is a country pair (c, p), e.g. (*Britain*, *Egypt*), in a given year. In line with the terminology of the model, we call country c a coercer and country p a policymaker when we study how the distribution of power *over* p affects the relation between c and p.[4] The crucial empirical prediction that distinguishes our theory from other natural hypotheses is that the relation between a coercer c and policymaker p is not determined by c's power over p but by the power that every other country has over p. Specifically, our key variable of interest is the Weaker Powers Index of c over p, the share of total power over p of all those countries that have less power over p than c does. Our theory predicts that coercer c should obtain larger geopolitical rents from p (e.g., more favorable policies) when it has a higher WPI over p.

As a first step, we must measure power, which in our model is defined only by its effects on the policymaker's political stability (its survival).[5] In line with Moyer et al. (2018), we measure the power that one coercer has on a policymaker as the *economic power* that the former has on the latter: the value of the trade flow between the two divided by the value of all goods produced or consumed in the latter. According to this metric, a coercer is *stronger* than another one relative to a policymaker if it can impose more significant economic imbalances on the policymaker.[6] As a result, a coercer's Weaker Powers Index on a given policymaker is the combined economic power that all weaker coercers have on the policymaker. By our main result, this one-dimensional function of the power distribution is sufficient to summarize the effects of power on transfers (thus equilibrium payoffs).

[4]In our baseline specification, the same country can be both a coercer and a policymaker. However, results are robust to focusing on subsamples where only major powers can be coercers, and they cannot be policymakers, i.e., they cannot be affected by other coercers (See Section E.3 for details).

[5]Due to this consequence-based approach, we did not need to take a stand on which variable generates power. Consequently, in our model, countries might be employing different types of resources to exert their influence, e.g., different mixes of economic and military leverage.

[6]Economic power is related to the idea of trade dependence. A country with a large economic power can impose larger demand shortages or excesses in supply by simply delaying or blocking trade flows. In future work, we could derive a more theoretical-driven measure using the methodology of Kleinman, Liu and Redding (2020). In Section E.1, we replicate all our results with a more complex but realistic measure of power, the Formal Bilateral Influence Capacity (FBIC) developed by Moyer et al. (2018).

In our main empirical analysis, we study the effect of power on several outcomes from the GDELT dataset of international interactions. Each variable within such dataset is generated from news articles reporting the occurrence of a particular type of interaction for different country pairs between 1979 and 2012.[7] For our first set of variables we focus on the policymaker's *offers*, i.e., the number of times over a year in which a country (a policymaker) pledged/offered/promised to another country (a coercer) to expand their cooperation in the economic, military or diplomatic domains. We interpret these variables as complementary components of the equilibrium transfer analyzed in the theoretical analysis. For our second set of variables, we focus on a coercer's decision to send *aid*: the number of times over a year in which a country (a coercer) sent economic, military, or humanitarian aid to another country (a policymaker). These variables are connected to the equilibrium transfers as coercers that receive a higher equilibrium transfer from a policymaker should be, on average, more willing to send aid in times of need. Formalizing the connection between these variables and the equilibrium transfer, we derive the prediction that each of these outcomes should be an increasing function of a coercer's WPI on that policymaker.

Our baseline analysis shows that the lag of a coercer's WPI on a policymaker is a significant determinant of the economic, military, and diplomatic offers sent from the policymaker to the coercer and the economic, military humanitarian aid sent from the coercer to the policymaker. A standard deviation increase in WPI leads to an increase of around 10% for each of these variables. In line with the theory, the driver of these results is the changes in third parties' power. Indeed, when we include both the WPI and a country's own economic power, we find for the latter a non-significant or even negative effect.[8] While the results hold across multiple specifications, our baseline analysis conditions on coercer-policymaker trade flows and includes fixed effects that net out any time-invariant bilateral characteristic (e.g., distance, shared language, etc.) and any time-varying unilateral feature (e.g., GDP, population, etc.) of both the policymaker and the coercer.

As a second empirical exercise, we focus on the effects of the collapse of the Soviet Union and the rise of China on the other major powers (a large change in their WPI).[9] In line with the theory, we show that the collapse of the Soviet Union had a significantly negative impact on coercers *where* they were stronger than the Soviet Union, relative to *where* they were weaker. This result is consistent with the idea that, with the fall of the Soviet Union,

[7] The GDELT dataset can be accessed from https://www.gdeltproject.org

[8] This also holds when we flexibly control for the main source of correlation between WPI and a coercer's own power, i.e., a coercer's rank in the distribution of economic power. Indeed, the results hold when we include power rank fixed effects or when we restrict attention to subsamples with no changes in rank.

[9] Again, our specifications control for every time-invariant bilateral characteristic and every time-varying unilateral characteristic of each coercer and policymaker. Moreover, we condition on coercer-policymaker trade flows and the coercer's economic power on the policymaker.

the average major power improved its relations with the Soviet-aligned countries, whereas its relations with the other countries deteriorated. Similarly, we show that the rise of China has a positive impact on the average major power *where* it is stronger than China, relative to *where* it is weaker. In addition, we find the same pattern when restricting attention to the effect on the United States.

Finally, we replicate our baseline analysis for imports and exports.[10] A standard mechanism for how power affects trade is that more powerful countries can obtain more favorable trade policies that reduce trade frictions.[11] We explore this idea with a Gravity specification from Anderson and van Wincoop (2003) and address the potential endogeneity of economic power with a 2SLS estimation. Once again, we find that the WPI is very predictive of both imports and exports, even when we condition on a coercer's relative power: one standard deviation increase in WPI increases both imports and exports by more than 20%.

The rest of the paper is structured as follows. Section 2 introduces two simple examples that motivate the set-up of our theoretical analysis. Section 3 presents our theoretical analysis. Section 4 includes our empirical exercises, a discussion of their robustness, and the various validation tests that we perform. Section 5 presents future research directions. Section 6 concludes. The main Figures and Tables are collected after the references and before the Appendices. All proofs are in the Appendices.

1.1 Contribution to the literature

Our project is at the intersection of international economics and political economy. After the seminal work of Hirschman (1980), the modern literature in this field has been mainly empirical, studying how exports and imports (Yeats, 1990; Berger et al., 2013; Fuchs and Klann, 2013; Mityakov, Tang and Tsui, 2013; Du et al., 2017; Didier and Koenig, 2019; Davis, Fuchs and Johnson, 2019), economic and financial aid (Kuziemko and Werker, 2006; Dreher and Jensen, 2007; Kilby, 2009; Faye and Niehaus, 2012; Rommel and Schaudt, 2020), loans (Li and Ngo, 2018; Garmaise and Natividad, 2013; Ambrocio and Hasan, 2021), and even the extent of media coverage of human rights' violations (Qian and Yanagizawa, 2009; Qian and Yanagizawa-Drott, 2017) are all linked to political considerations and power.[12] The main theoretical paper in this literature is Antràs and Padró i Miquel (2011), studying the welfare effects of the action of one foreign power that constrains the policies of a local ruler. Our contribution to this literature is to show how standard intuitions might change when we study

[10] Our source is CEPII, covering the 1949-2019 period. It can be accessed from http://www.cepii.fr/

[11] Also Berger et al. (2013) assumes that the effect of power acts through bilateral trade costs.

[12] There is also a complementary strand of this literature that studies how economic considerations can affect political outcomes, e.g. Kleinman, Liu and Redding (2020).

a country's foreign interests, its foreign policy, and the effects of its power in an environment with geopolitical competition, i.e., where there are multiple countries capable of exerting pressure on the same ones. Specifically, we show that when geopolitical competition is important, then the effects of a country's own power become highly non-linear and even non-monotone.[13] But also, our model provides a simple (and empirically relevant) way to account for these complex dynamics without sacrificing the value of postulating a simple relation between power and outcomes. Indeed, we show that the role of geopolitical competition can be summarized by a simple one-dimensional function of the power distribution: the Weaker Powers Index.

Our paper also speaks to the empirical literature that focuses on trade flows, especially the literature that employs gravity models (for reviews, cfr. Anderson 2011 or Bergstrand and Egger 2013; for recent work, see Arkolakis, Costinot and Rodríguez-Clare 2012, and Anderson and Yotov 2020). These models decompose bilateral flows as only a function of the characteristics of the two countries involved, and two multilateral resistance terms, which summarize the frictions originating from the existence of other countries. Crucially, Anderson and van Wincoop (2003) shows that these multilateral resistance terms can be decomposed into an inward and outward component, where these components are specific to a particular country, not to a particular bilateral relation. This finding allows to reduce the dimensionality of the problem considerably: for instance, it is possible to account for the effect of third parties by simply including country fixed effects (one for each side of the bilateral relation), or with a normalization (Anderson, 2011). Our model shows that once we introduce power into a gravity model of trade, each bilateral trade flow is again a function of the characteristics of third parties. While country fixed effects or normalizations cannot account for this dependence, we show that this can be done by adding the Weaker Powers Index to the standard estimating equation. Moreover, we show that this variable is an important determinant of international exchanges, including exports and imports.

Finally, our paper contributes to the vast literature that studies the role of power in international relations. Specifically, our paper contributes to the growing literature that focuses on the role of power rankings and status-consciousness (e.g., Lake, 2011; Paul, Larson and Wohlforth, 2014; Organski and Kugler, 2015; Mattern and Zarakol, 2016; Renshon, 2017; Wolf, 2021; Powers and Renshon, 2021; for reviews, cfr. Dafoe, Renshon and Huth, 2014, or MacDonald and Parent, 2021). Motivated by a large set of case studies, this literature departed from the standard assumption that countries want to maximize their share of world power (Mearsheimer, 2007), and focused instead on the idea that they care about "others'

[13]Note that these non-linearities in the effect of power would also translate into non-linearities in the incentive to invest in power.

perceptions of a state's *ranking* on a set of valued characteristics" (including power) (Murray 2018, p.45). The typical justification of this assumption is that it is an intrinsic characteristic of human preferences, something that has indeed been confirmed in multiple experiments (Renshon, 2017). A major shortcoming of this approach is that it is not obvious how this preference would translate into world politics and how much it should be expected to matter. This ambiguity has prevented the literature from developing a theory that can be built upon and empirically tested. What type of status matters (relative to what type of resources)? Relative to whom? How is it linked to material interests? All these questions are crucial to understand how status matters in world politics, and what consequences it might have. Our first contribution to this literature is to provide a simple and testable framework where each of these questions can be addressed: in our theory, status-consciousness is linked to material interests in a way that depends on local conditions (the local distribution of power).[14] Our second contribution is to validate the theory empirically, showing that our theory of status is important to understand a wide array of modern international exchanges, and not only historical cases.

2 The key mechanism in an example

The key mechanism that drives our results is the idea that obtaining the support of a major power allows a local ruler to make decisions that are unpopular with the other major powers. We illustrate this force with two famous episodes from the Cold War.

In 1951, the newly elected Prime Minister of Iran, Mosaddeq, nationalized the Anglo-Iranian Oil Company. This decision triggered tensions with Britain which, in 1953, successfully orchestrated a coup against the Iranian president, with the support of the United States. The decision of the US to join Britain against Mosaddeq was in part driven by the fear that the Soviet Union could be soon attempting to sponsor their own regime change in Iran (Barr 2018, pp. 160-174). In other words, the undoing of Mosaddeq was the absence of any clear alignment with any of the major powers.

In 1956, the Egyptian President, Nasser, nationalized the Suez Canal, another major blow to British interests. This time the United States declared their support for Nasser, as they knew that Nasser enjoyed the support of the Soviet Union and thus were not worried about a communist take-over (Barr 2018, pp. 233-247). As Nasser was backed by the two

[14] Note that expressing status-consciousness in terms of material interests is crucial to understand how much countries should be expected to invest to advance or defend it, for instance with conflicts. Indeed, this is an important step as the idea of status-consciousness is typically applied to study conflicts (Dafoe, Renshon and Huth, 2014).

global superpowers, Britain had no choice but to accept the nationalization.

3 A model of Geopolitical Competition

Our model studies the determinants of the relation between a policymaker p and multiple coercers $c \in C$. In the examples of Section 2, a coercer c would be a major power such as the Soviet Union, the United States or Great Britain. Instead, the policymaker p would be Nasser or Mosaddeq, i.e., the ruler of some home country that tries to enlist the support of each c. We consider a game with the following timing and characteristics:

- The policymaker publicly announces a transfer for each coercer, $\mathbf{B} = (B_c)_{c \in C}$.
- Given the offer, coercers simultaneously choose whether to support the policymaker ($c \in IN$) or oppose it ($c \in OUT$).
- Given the decisions of the coercers, with probability $Pr(FAIL)$ the policymaker fails and with probability $1 - Pr(FAIL)$ it survives.
- A coercer that supports the policymaker obtains $-\kappa < 0$ when the policymaker fails and obtains $B_c - \kappa$ when it survives.[15] A coercer that opposes the policymaker obtains an outside option of 0, regardless of whether the policymaker fails or survives.

We interpret the event $FAIL$ as the local ruler p losing power in its country (regime change or failure) and B_c as the benefit that major power c obtains from its relation with p. The assumptions that the benefit B_c is received only if the local ruler remains in power and that $-\kappa < 0$ imply that supporting a policymaker when the policymaker fails is worse than opposing it. This captures the idea that supporting a local ruler exposes to the risk that it fails. To focus on this feature in the simplest way, we assume that rejecting the offer yields a fixed outside option of 0.

3.1 Power and the endogenous probability of failure

To model how the probability of success depends on the choices of the coercers, we introduce an element of heterogeneity which we call *power* and denote by W_c. We assume that the power of the policymaker, W_p, and the distribution of power of the coercers, $\mathbf{W} = (W_c)_{c \in C}$, is common knowledge.

[15] The assumption that B_c is only received when the coercer supports the policymaker could be derived from a setting where p offers transfers that are conditional on the coercers' decisions and that are constrained to be non-negative.

Given the coercers' decisions, i.e., sets $IN \subseteq C$ and $OUT = C \setminus IN$, we define w_{OUT} as the share of total power controlled by the coercers that oppose the policymaker, i.e., we let

$$w_{OUT} = \frac{\sum_{j \in OUT} W_j}{\sum_{j \in C} W_j + W_p}$$

Given a continuous and strictly increasing function $F(\cdot)$, we make the following assumption:

$$Pr(FAIL) = F(w_{OUT})$$

This assumption justifies our interpretation of W_c as the power that c has over p. Indeed, the characteristic W_c measures how the probability of p's survival depends on c's decision. In other words, W_c measures the importance for p of inducing c's support, capturing the intuitive idea that the decisions of *stronger* coercers are more important. Note that we are modeling power by its effect on the final outcome, not as an endowment of some specific resource. This allows us to think of power as generated by different types, or even by a different mix, of coercive resources.

In addition, this assumption justifies our interpretation of accepting/rejecting the offer as a decision on whether to support/oppose the policymaker. Indeed, this specification assumes that the probability of success depends positively on the power of those that accept the offer and negatively on the power of those that reject it. This is in line with our motivating examples in Section 2, where opposing the regime was the same as making a military intervention against it.[16] But it is also in line with a setting where the decision to support a regime is the same as choosing whether to encourage or discourage trade with it. Indeed, when a major power decides to discourage trade with another country, then this can cause a recession and possibly a regime change. On the other hand, encouraging trade with another country can benefit its economy, thus reducing the probability of regime change.

In Section D.2 we compare the empirical performance of this model against the prediction derived under the more general assumption that $Pr(FAIL)$ is a decreasing function of the power of all supporting coercers (and the policymaker) and an increasing function of the power of all opposing ones. The analysis shows that this more general prediction does not add much to our empirical findings, justifying our focus on the simpler specification presented here.

[16] To interpret the choice $f \in NO$ as a military intervention, it would be natural to assume that the value of the outside option is increasing in W_c. It is possible to show that our results hold under this assumption.

3.2 Coercers' problem: supporting or opposing a local ruler

In line with the motivating examples in Section 2, a crucial feature of our setting is that the incentive of a coercer to support the policymaker depends on its expectations about what others do. Given the vector of offers, $\mathbf{B}$, and the set of coercers that are expected to oppose the policymaker, $OUT \subseteq C$, the decision of coercer c on whether to support the policymaker is as follows

$$c \in IN \quad \Longleftrightarrow \quad [1 - F(w_{_{OUT}})]B_c - \kappa \geq 0$$

Naturally, this condition is more likely to be satisfied when B_c is greater. This means that B_c is a tool for the policymaker to induce c to support it. But also, this condition is more likely to hold when $w_{_{OUT}}$ is smaller. Thus, the game features strategic complementarities: players are more willing to support the policymaker, when the policymaker is expected to be supported by a more powerful coalition of coercers.

In international relations there are at least two sources of strategic complementarities. One is the simple idea that that a country is more likely to reach its objectives when it convinces other countries to join its action, rather than to oppose it. Another more subtle source of strategic complementarity can be appreciated from the foreign policy stances of the United States and the Soviet Union during the Cold War (the so-called Truman and Brezhnev doctrines). Both powers pledged a military intervention whenever they feared that the other major power was about to make an intervention. In this case, the source of the strategic complementarity comes from the fear that the opponent might gain an advantage by catching the other power off guard.

In the motivating examples of Section 2, the first source of strategic complementarity emerges from the role of the United States: the logistic support of the United States was crucial to successfully substitute Mosaddeq; on the other hand, Great Britain immediately aborted its action against Egypt when it was clear that they did not have the support of the United States. The second source of strategic complementarity can be understood by the role of the Soviet Union: the United States decided to support Britain against Mosaddeq because it feared that the Soviet Union could make its move against Mosaddeq. Instead, it sided with Nasser because it did not fear any action of the Soviet Union.

3.3 Policymaker's problem: buying the major powers' support

Rather than restricting ourselves to a particular specification of the policymaker's payoff, we will simply make the assumption that the objective of the policymaker is to maximize its

probability of survival at the minimum cost $\sum_{c \in C} B_c$.

However, because our model features strategic complementarities and coercers choose simultaneously, then the same offer $\mathbf{B}$ will typically be consistent with multiple equilibria. Thus, whether a particular offer $\mathbf{B}$ maximizes the probability of survival will typically depend on whether the policymaker expects the coercers to coordinate on one particular equilibrium or on another one.

In line with a recent literature (Segal, 2003; Winter, 2004), we impose a cautiousness refinement, assuming that the policymaker's objective is to maximize its probability of survival in the worst-case equilibrium compatible with the given offer.

Definition 1 (Robust offers) *A vector of offers $\boldsymbol{B}$ is robust if there is no SPE where the policymaker offers $\boldsymbol{B}$ and one or more coercer oppose the policymaker.*

In the context of our game, this requirement is the same as imposing that the offers must be such that the only rationalizable response for each coercer is to support the ruler. Or, in terms of equilibrium, this is equivalent to restricting attention to offers that are only compatible with equilibria where all coercers accept them (unique implementation, as in Halac, Kremer and Winter, 2021).

An important feature to highlight is that focusing on robust offers is not the same as focusing on worst-case outcomes, as robust offers are still part of an equilibrium.[17] In other words, a local ruler that makes robust offers must not only make sure that each major power wants to support it individually, but also that they do not end up withdrawing their support out of fear that another major power will do so. This assumption is an essential ingredient of our motivating examples in Section 2. Great Britain could sway the United States into opposing Mosaddeq by playing on the possibility of a communist take-over. On the other hand, the United States supported Nasser as there was no doubt that Nasser was supported by the Soviet Union.

3.4 Simple case: the value of political alignment

To build intuition for our main result, we discuss a simple example where a policymaker p with power $W_p = 0.4$ deals with two identical coercers c and $-c$, with power $W = 0.3$.

[17] There is a large literature in International Relations that focuses on worst-case scenarios (Tang, 2008). For instance, Mearsheimer (2001) justifies this assumption as follows "Intentions are ultimately unknowable, so states worried about their survival must make worst-case assumptions about their rivals' intentions" (p. 45). Unlike this assumption, we do not subscribe to the idea that intentions are unknowable, as our equilibrium analysis is restricting the set of possible intentions using rationality and common belief in rationality. But within the outcomes that are compatible with this restriction, then we focus on worst-case scenarios.

Suppose that the policymaker offers B_2, the smallest transfer that induces c to support the policymaker when $-c$ is expected to support the policymaker as well:

$$B_2 \quad \text{such that} \quad [1 - F(0)]B_2 - \kappa = 0$$

Offering B_2 to both coercers is part of an equilibrium: if the two coercers actually expect the other to support the policymaker, then it is rational for them to accept B_2. But the offer $\mathbf{B} = (B_2, B_2)$ is not robust: there is an equilibrium where neither of the two coercers accept B_2 as they expect that the other will not support the policymaker.

An offer $\mathbf{B}$ that certainly satisfies our robustness requirement is $\mathbf{B} = (B_1, B_1)$, where $B_1 > B_2$ is the smallest transfer that induces c to support the policymaker when $-c$ is expected not to support the policymaker:

$$B_1 \quad \text{such that} \quad [1 - F(0.3)]\, B_1 - \kappa = 0$$

While by construction $\mathbf{B} = (B_1, B_1)$ is a robust offer, it is not cost-minimizing. Once the policymaker offers B_1 to c, then $-c$ will anticipate that c will always support the policymaker. As a consequence, the policymaker can reduce the offer that it makes to $-c$ from B_1 to $B_2 < B_1$, without compromising the robustness of its offer.

But, in this example, c and $-c$ are identical. So, there are two cost-minimizing robust offers that are equally appealing for the policymaker (B_1, B_2) or (B_2, B_1). Both these offers can be thought of as the result of a two-step procedure: assign a rank to each coercer and then offer B_1 to rank 1 and B_2 to rank 2. Indeed, the next Section shows that this structure is the key feature of every robust cost-minimizing offers.

As this example shows, our analysis captures the key mechanism highlighted in the examples of Section 2: obtaining the support of a major power allows the local ruler to make decisions that are unpopular with the other major powers.

3.5 Main result: why aligning with the stronger powers

Generalizing the logic of Section 3.4 to the case with multiple and heterogeneous coercers, we reach our main result:

Theorem 1 *Any cost-minimizing robust offer can be constructed as follows:*

- *Assign a rank to each c so that more powerful coercers obtain a higher rank;*
- *To each coercer, offer the smallest B that induces it to support the policymaker when all and only higher-ranked coercers support the policymaker.*

As discussed in the example, the theorem is driven by the logic that making an offer that guarantees the support of a coercer allows the policymaker to reduce the offers that it makes to the other coercers, without reducing its probability of survival. This is driven by strategic complementarities: when a country obtains the support of one of the coercers, this increases its probability of survival, which allows the policymaker to offer smaller transfers to the other coercers without losing their support.

The only element of the theorem that is new relative to the discussion of Section 3.4 is the finding that the ranking is pinned down by the distribution of power: higher ranks are assigned to stronger coercers. To understand this, note that every equilibrium offer must be increasing in the power of all lower-ranked coercers and decreasing in the power of all higher-ranked coercers. Thus, to minimize total costs, the policymaker prefers to assign higher ranks to stronger rather than weaker coercers.

3.6 Comparative statics and the Weaker Powers Index

To lay the ground for the empirical analysis, we discuss some comparative statics on how changes in the distribution of power affect equilibrium transfers (and thus payoffs).

For notational simplicity, from now on we assume that there are no ties in the distribution of power, i.e., we assume that $W_c = W_{c'}$ if and only if $c = c'$. In this case, there is a unique cost-minimizing robust offer $\hat{\mathbf{B}}$. For each c, let $W^{tot} = \sum_{j \in C} W_j + W_p$, such offer is

$$\hat{B}_c = \frac{\kappa}{1 - F\left(\frac{\sum_{\ell : W_\ell < W_c} W_\ell}{W^{tot}}\right)} \tag{1}$$

The first element that emerges is that $\hat{B}_c$ depends on the whole distribution of power $\mathbf{W}$ in a non-trivial way: it is a non-monotone function of W_c and of each $W_{c'}$. To make progress in characterizing this dependence, we introduce the definition of a coercer's power rank:

Definition 2 *The **Power Rank** of $c \in C$ is a function $\rho : \mathbb{R}_+^N \to \{1, 2, .., N\}$ such that for each $c, c' \in C$, $\rho^c(\boldsymbol{W}) < \rho^{c'}(\boldsymbol{W})$ if and only if $W_c > W_{c'}$. We say that c has higher (lower) power rank than c' if $\rho^c(\boldsymbol{W}) < \rho^{c'}(\boldsymbol{W})$.*

From Equation 12, we can see that, once we fix the power rank, we can provide the following comparative statics:

Proposition 1 *Consider changes in W_c that do not affect $\rho^c(\boldsymbol{W})$, then*

- *for any c' with $W_{c'} > W_c$, $\hat{B}_{c'}$ is increasing in W_c,*
- *for any c' with $W_{c'} < W_c$, $\hat{B}_{c'}$ is decreasing in W_c.*

To understand the logic behind these comparative statics, recall that, from the previous theorem, every coercer receives a transfer that induce it to support the policymaker when all weaker coercers oppose the policymaker and all stronger ones support it.

With this in mind, it is natural to expect the equilibrium transfer to increase in the power of weaker coercers: a policymaker who is opposed by stronger coercers have a lower expected probability of survival and must thus promise a larger transfer to induce support. Symmetrically, we can see why the equilibrium transfer must be decreasing in the power of stronger coercers: when the policymaker is supported by stronger coercers, its probability of survival is higher, and it can thus induce others to support it with a lower transfer.

In addition, when the power rank is fixed, we can also show the counter-intuitive result that a country's equilibrium payoff is decreasing in its own power:

Proposition 2 *$\hat{B}_c$ is decreasing in any change in W_c that does not affect $\rho^c(\boldsymbol{W})$.*

The logic for this result is straightforward: when a country chooses to support the policymaker, then its power contributes to increasing the policymaker's probability of survival. As a consequence, for fixed power rank, when a coercer becomes more powerful, the policymaker can reduce its transfer while still inducing its support.

When we study changes in power that also affect the power rank, then the model features some important non-monotonicities and non-linearities. For instance, an increase in power that increases a coercer's power rank can improve its equilibrium payoff, but at the same time this positive effect can be smaller when the change is larger. As discussed in the introduction, these rich dynamics can capture some important and counter-intuitive patterns of modern and historical international relations. However, as we will shortly show, we can still provide a simple and complete characterization of how the distribution of power affects payoffs, even when the power rank is at stake. A first step to do so is to introduce the definition of the Weaker Powers Index:

Definition 3 *The **Weaker Powers Index (WPI)** of c over p is defined as the combined share of total power W^{tot} of every coercer that is weaker than c, i.e. the function*

$$WPI^c(\boldsymbol{W}) = \frac{\sum_{\ell:W_\ell<W_c} W_\ell}{W^{tot}}$$

Given this definition and Equation 12, we can establish the following result:

Proposition 3 *The equilibrium payoff that each c obtains from p is increasing in c's WPI over p. Moreover, the distribution of power $\boldsymbol{W}$ affects the distribution of equilibrium payoffs only via the vector of WPIs, i.e., $(WPI^c(\boldsymbol{W}))_{c\in C}$.*

This proposition tells us that all the non-monotonicities of our model can be summarized by a single one-dimensional index of the distribution of power, the WPI. In addition, as we show in Proposition 4, we can show that our model is compatible with a log-linear relation between equilibrium transfers and WPI, implying a relatively simple and easy to test relation.

Note that, given a distribution of power $\mathbf{W}$, coercers with higher power rank have a larger Weaker Powers Index. As a consequence, the WPI can be thought of as formalizing the idea that the power rank matters in international relations, as assumed by a large literature in international relations (see Section 1.1). Moreover, the dependence of equilibrium payoffs on the Weaker Powers Index clarifies *how* the power rank matters: it matter through the Weaker Powers Index.

3.7 Towards the empirics: multiple policymakers and periods

In order to speak to the empirical analysis and historical applications, we expand the model to multiple time periods $t \in T$ and multiple policymakers $p \in P$, and make some simpifying assumptions about the parameter space. We will expand the model in the simplest possible way by simply assuming that the interaction between every policymaker and every coercer is a repetition of the game that we analyzed above.[18] Still, to express the previous results in this more complex environment, we need to develop some notation.

Every policymaker $p \in P$ faces a distribution of power in each t that we denote by $\boldsymbol{W}_{pt} = (W_t^p, (W_t^{c\to p})_{c\in C})$, where $W_t^{c\to p}$ is the power that coercer c has over policymaker p in period t and W_t^p is the (domestic) power of country p, i.e., its ability to protect itself from external influence. We let $W_{pt}^{tot} = \sum_{j\in C} W_t^{c\to p} + W_t^p$ be the total power that is relevant for p in period t. Given a distribution of power among the coercers and W_{pt}^{tot}, we denote the WPI that country c has over country p in period t as the following function

$$WPI_t^{c\to p}(\mathbf{W}_{pt}) = \frac{\sum_{\ell\in C W_t^{\ell\to p} < W_t^{c\to p}} W_t^{\ell\to p}}{W_{pt}^{tot}}$$

Finally, we denote the transfer (or payoff) vector $\boldsymbol{B}_{pt} = (B_t^{p\to c})_{c\in C}$, where $B_t^{p\to c}$ is the transfer (payoff) offered by policymaker p in each period t to coercer $c \in C$.

For what concerns the model's parameters, we allow the cost $\kappa > 0$ of supporting the policymaker to be heterogeneous in each period and for each policymaker, we thus denote it by κ_{pt}.[19] In addition, we assume that the function that determines the probability of failure,

[18] This amounts to assuming that countries are not sufficiently patient to play anything different than the repetition of the equilibrium that we discussed.

[19] In the empirical analysis, this parameter will be absorbed by the fixed effect capturing all unilateral time-varying characteristics of each policymaker.

i.e. $F(\cdot)$, takes the following functional form $F(w) = 1 - e^{-\lambda w}$, for any $w > 0$ and some $\lambda > 0$. Under these assumptions, we can derive from the previous analysis the following result

Proposition 4 *The equilibrium transfer (thus payoff) $\hat{B}_t^{p\to c}$ that each c receives from each p in every period t is such that:*

$$\ln(\hat{B}_t^{p\to c}) = \ln(\kappa_{pt}) + \lambda WPI_t^{c\to p}(\boldsymbol{W}_{pt}) \tag{2}$$

Note that the assumption $F(w) = 1 - e^{-\lambda w}$ with $\lambda > 0$ means that λ measures the responsiveness of the probability of survival to the power of the coercers that support the policymaker. In other words, λ is the channel that introduces the strategic complementarities into our model. As we can see above, the Weaker Powers Index matters if and only if $\lambda > 0$, clarifying that strategic complementarities are the key mechanism whereby the WPI affects equilibrium payoffs.

4 Empirical analysis: how the Weaker Powers Index shapes international cooperation

In our empirical analysis, our unit of observation is a country pair over in a given year. As we will show, both our measures of power and our outcomes are *directed variables*. For instance, the aid that country B sends to country A is directed, as it is typically different from the aid that A sends to B (see Table 1 for other examples).

As we deal with directed variables, we specify the role played by each country in the pair. In line with the model's terminology, when we study how the relation between country A and B is affected by the power over country B, we call country A a coercer and country B a policymaker. To emphasize this aspect of our data, we will refer to each observation as a policymaker-coercer pair.

The crucial empirical prediction that distinguishes our theory from other natural hypotheses is that the relation between a coercer A and policymaker B is not determined by A's power over B but by the power that every other country has over B. Specifically, our key variable of interest is the Weaker Powers Index of A over B, the share of total power over B of all countries that have less power over B than A does. As formalized in Equation 2, we wish to test the hypothesis that coercer A obtains larger geopolitical rents from B (e.g., more favorable policies) when it has a higher WPI over B.

Our baseline specification allows the same country to be both a policymaker for multiple

coercers and a coercer for multiple policymakers.[20] We test our model with three empirical exercises. First, in Section 4.3.1, we show that the WPI plays a much more fundamental role than a country's own power to predict the pattern of international cooperation. Secondly, Section 4.4 shows that our model can accurately predict the effect of the fall of the Soviet Union and the rise of China (two large changes in WPI) on the average major power as well as on the United States. Finally, Section 4.5 demonstrates the empirical relevance of the WPI to understanding bilateral trade flows.

4.1 Measuring power at the bilateral level: Economic Power

Until now, we considered a coercer as more powerful when its decision to support/oppose the policymaker had a larger impact on the probability of survival of the policymaker (the policymaker's political stability). For the empirical analysis we must abandon this fairly general definition and measure power from observable characteristics. Our empirical analysis focuses on economic power, the ability of a country to destabilize another one by harming its economy.

A simple way to measure this is to define the power of every coercer c over a policymaker p in period t as the value of the trade flow between the two, $Trade_{cpt}$.[21] In other words, this measures power as the ability of a country to manipulate trade flows causing economic imbalances in another country.

In line with this, the ability of policymaker p to protect itself from the power of all the coercers is instead defined as $GDP_{pt} - Exports_{pt}$, the value of all finished goods and services produced *and* consumed in country p in period t (the size of p's economy in period t when isolated from the international system).[22] Based on this, we can conclude that the total economic power that is relevant for country p in period t is $GDP_{pt} + Imports_{pt}$. We can thus provide the following definition of a coercer's relative economic power over a policymaker:

Definition 4 *A coercers c's* ***Relative Economic Power*** *(REP) over p in period t is*

[20] This analysis uses a global sample, where every country is both a policymaker and a coercer. The results are robust to focusing on subsamples where only major powers (flexibly defined) can be coercers, and they are excluded from the set of policymakers (see Section E.3).

[21] Our source of data is the publicly available CEPII Gravity, http://www.cepii.fr/. Such a dataset includes yearly observations at the country pair level on imports, exports, population, GDP, and many other variables used in Gravity models. The dataset covers the 1949-2019 period. Appendix C details the construction of trade flows.

[22] Recall that a country's GDP is the value of all goods and services produced within the country. As a consequence, it includes exports but it excludes imports. That is why we are considering $GDP_{pt} - Exports_{pt}$ rather than $GDP_{pt} - \sum_{c \in C} Trade_{cpt}$.

defined as the share of economic power over p that is controlled by c in period t:

$$E_t^{c\to p} = \frac{Trade_{cpt}}{GDP_{pt} + Imports_{pt}}$$

We let $\mathbf{E}_{pt} = (E_t^{c\to p})_{c\in C}$ be the distribution of power shares over p in a particular period, i.e., the vector collecting the REP that each c has over p in t.

Note that, from the policymaker's perspective, the concept of Relative Economic Power captures its trade dependence relative to c, a standard measure of a country's vulnerability towards another one (Moyer et al., 2018). In Section E.1 we show that we can replicate all of our results with a more complex but realistic measure of power.

4.1.1 The Weaker Powers Index of Economic Power

As we have seen in Definition 3, the Weaker Powers Index of a coercer is simply the share of power of all weaker coercers. Because Definition 4 introduces a country's Relative Economic Power as the country's power share, we can define the Weaker Powers Index of economic power directly from the distribution of Relative Economic Powers.

Definition 5 *The **Weaker Powers Index (WPI)** of economic power is the share of total economic power over p controlled by coercers with less economic power over p than c*

$$WPI_t^{c\to p}(\mathbf{E}_{pt}) = \sum_{\ell\in C: E_t^{\ell\to p} < E_t^{c\to p}} E_t^{\ell\to p}$$

Importantly, recall that we defined the Relative Economic Power $E_t^{\ell\to p}$ as the *share* of total economic power over a policymaker. Thus, the trade flow between coercer and policymaker (the coercer's economic power over a policymaker) is in the denominator of the coercer's WPI over the policymaker. Consequently, while there is a positive correlation between the WPI of c over p, their trade flows, and the coercer's REP over such policymaker, any increase in the economic power of c over p will decrease its WPI over p.

In Table E.1, we provide some summary statistics for our measures of power, and we show that the correlation between the WPI and the REP is 0.71. However, such correlation is reduced to 0.57 when applying the fixed effects of our baseline specification (Table E.2), and it goes to 0.41 when we also condition on the coercer's rank in the distribution of power (see Section 4.3.2).

4.2 (Indirectly) measuring transfers: International Interactions

Our model characterized a relation between the distribution of power and the aggregate transfer (payoff) that each coercer obtains from each policymaker. We will test this indirectly by focusing on the relation between power and various types of international interaction.

Our source on international interactions is the GDELT dataset: an *Event Dataset* with a global coverage from 1979 to 2012.[23] Event Datasets like GDELT generate their variables from news articles. GDELT employs a machine-learning algorithm to infer the occurrence of a specific type of interaction between country pairs using news articles from multiple media agencies (see Leetaru and Schrodt 2013 for details). GDELT generates a separate variable for each type of interaction, where the possible types are the categories of the CAMEO taxonomy of international interactions (Gerner, Schrodt and Ömüur Yilmaz, 2009).

In our main empirical analysis, we focus on six variables, each corresponding to a specific CAMEO category: economic, military, and diplomatic *offers*, and economic, military, and humanitarian *aid*.

The first three variables focus on the decisions of each policymaker relative to each coercer. Indeed, each type of *offer* sums the number of times over a year in which a country (a policymaker) pledged/offered/promised to another country (a coercer) to expand their cooperation in some specific domain (economic, military, or diplomatic).

Studying aid, on the other hand, allows us to take the perspective of the coercer. Indeed, each type of *aid* is the sum of the number of times over a year in which a country (a coercer) sent some aid type (economic, military, or humanitarian) to another country (a policymaker).

Appendix C provides a detailed discussion on the construction of such variables.[24] Table 1 reports descriptive statistics and more details. Finally, in Section E.2 we replicate our results for an alternative type of outcomes from GDELT.

4.3 Testing the theory: how power affects International Interactions

As the transfer in our model, each type of *offer* increases the coercer's willingness to support (rather than to oppose) the policymaker. Instead, we are interested in aid because coercers who receive a larger equilibrium payoff from a policymaker should be more willing to support it in times of need.

Formalizing these ideas, in Appendix B we derive a positive log-log relation between

[23] The GDELT dataset is publicly available, https://www.gdeltproject.org

[24] As discussed in Appendix C, we scale these variables to improve our interpretation of the coefficients, and we transform them in a way that avoids dropping the zeros when taking the log.

each type of offer that the policymaker sends to the coercer (or each type of aid that the coercer sends to the policymaker) and the aggregate transfer that the coercer receives from the policymaker. Thus, by Proposition 4, there should be a positive log-linear relation between each of our outcomes of interest and the coercer's Weaker Powers Index (WPI) on a policymaker.

Let $\ln(Y_{cpt})$ denote a specific type of offer or aid. We focus on the following empirical specification:

$$\ln(Y_{cpt}) = \beta_1 WPI_{t-1}^{c\to p}(\mathbf{E}_{p,t-1}) + \beta_2 E_{t-1}^{c\to p} + \alpha \ln(Trade_{cpt}) + \alpha_{ct} + \alpha_{pt} + \alpha_{cp} + \varepsilon_{cpt} \quad (3)$$

The crucial element of interest in this regression is β_1. In Appendix B we show that this parameter is positive if and only if $\lambda > 0$, where λ is the link between the WPI and the equilibrium transfer, as discussed in Proposition 4. In other words, finding $\beta_1 > 0$ is a test of the relevance of the WPI for the equilibrium transfers. Moreover, note that we are estimating a separate β_1 for each type of aid and each type of offer, implying that we can use our various types of outcomes to cross-validate the analysis.[25]

The inclusion of $E_{t-1}^{c\to p}$, c's Relative Economic Power (REP) over a policymaker p, allows us to distinguish our theory (predicting $\beta_1 > 0$) from the natural hypothesis that relatively stronger countries should obtain better international relations (predicting $\beta_2 > 0$).

In Table 2 we estimate Equation 3 with the restriction that $\beta_2 = 0$, in the odd Columns of Table 3 we estimate Equation 3 with $\beta_1 = 0$ and in the even Columns of Table 3 we estimate the unrestricted specification. Finally, in Table 4, we estimate Equation 3 controlling for the major source of correlation between WPI and REP: the power rank. In the odd Columns, we include fixed effects for each coercer's rank in the distribution of economic power. Instead, in the even Columns, we report coefficients estimated in a subsample with no changes in rank.[26]

[25] We do this exercise because it is the most restrictive. In Appendix B we show that, under some conditions, if the various types of offers are complements, then the only thing that matters for each type of offer is the overall value that the policymaker wants to send to the coercer, thus the WPI of the coercer. Similarly, suppose the various types of aid are complements. In that case, the only thing that matters for each type of aid is the overall investment that the coercer is willing to make to increase the policymaker's probability of survival, which is an increasing function of the equilibrium transfer, thus the WPI of the coercer. Additionally, it can be shown that each of these outcomes contains some separate information about the WPI. Indeed, in Appendix D.6, we show that we can find a relation between the WPI and each of these outcomes when we control for the others.

[26] Footnote 29 defines a coercer's rank, Footnote 30 defines rank fixed effects, and Footnote 31 provides details on the subsample of interest. The correlation between REP and WPI is 0.41 when we add rank fixed effects.

4.3.1 Discussion of the Specification

Equation 3 includes a restrictive set of fixed effects: α_{pt} and α_{ct} net out all time-varying unilateral characteristics of every coercer and every policymaker (e.g., GDP, Population, etc.), and α_{cp} nets out all time-invariant bilateral characteristics (e.g., distance, common language, etc.) between each policymaker and each coercer.

Consider, as an example, the case of offers. The inclusion of α_{ct} implies that the coefficient β_1 is estimated using the variation in the number of offers that coercers receive *in the same year* but from different policymakers. In addition, the inclusion of α_{pt} normalizes such variations to account for the number of offers that each policymaker has sent in that year. Finally, the inclusion of α_{cp} means that all these variations are relative to the long-run outcome of the particular coercer-policymaker pair under consideration. In Section D.1 we discuss why we include these fixed effects and we show that results are robust to alternative specifications.

Furthermore, note that Equation 3 controls for the log of the trade flow between policymaker and coercer, $\ln(Trade_{cpt})$. Consequently, we are dropping all coercer-policymaker pairs that do not trade with each other, which is consistent with the idea that our theory should apply to coercers with some power over a given policymaker.

Finally, note that we are using the distribution of economic power of the previous period ($\mathbf{E}_{p,t-1}$) to measure a country's Relative Economic Power (REP) and to construct its WPI. Because we focus on lags and control for the same-year trade flows, our results are unlikely to be driven by some direct effect of trade or some omitted variable affecting trade flows and international interactions in the same year. To further corroborate this, in Section D.3 we show that our results do not change when we exclude trade flows and/or when we use the same-year distribution of economic power to calculate the REP and/or the WPI.

4.3.2 Results

Table 2 reports the result of estimating Equation 3 while fixing the coefficient of the lagged Relative Economic Power (REP) at zero, i.e., fixing $\beta_2 = 0$. Under this restriction, the Weaker Powers Index (WPI) lag emerges as an important determinant of every type of offer and aid. A standard deviation increase in the WPI (a change of 0.06) leads to a change that is between 12% (for economic offers) and 4% (for military aid).

As Table 2 does not condition on the coercer's REP, it could simply reflect the natural hypothesis that stronger countries obtain better international relations. Indeed, there is a positive correlation between a country's WPI and its REP. Moreover, the odd Columns of Table 2 show a positive effect of the REP on international interactions, when we omit the

WPI (i.e., fixing $\beta_1 = 0$ in Equation 3).[27]

To address this, in the even Columns of Table 3 we estimate Equation 3 without any restriction. We find that when we estimate the effects of both the Weaker Powers Index and the Relative Economic Power, the WPI remains positive and significant. In contrast, the REP turns negative (and significant). This surprising result is in line with the theoretical prediction that, for a given power rank, an increase in power can be detrimental.[28]

Finally, in Table 4 we compare the effect of the WPI and the REP while controlling for the major source of correlation between the two: the coercer's rank in the distribution of REP over a given policymaker.[29] In the odd Columns of Table 4 we include fixed effects for the coercer's rank in the distribution of REP.[30] In the even Columns of Table 4 we restrict attention to subsamples where there are no changes in rank.[31] Table 4 confirms the result that, conditioning on the REP, the effect of the WPI remains positive and significant for every outcome. On the other hand, conditioning on the WPI, the effect of the REP is either indistinguishable from zero or negative.

4.4 Event Studies: impact of the collapse of the Soviet Union and the rise of China on other major powers

This section performs two event analyses for the collapse of the Soviet Union (1989-1994) and the rise of China (2002 onwards). The objective is to study how these events affected the same coercer differently relative to different policymakers.

According to our model, we expect that the collapse of the Soviet Union harmed coercers *where* they were more powerful than the Soviet Union, relative to *where* they were weaker. Similarly, we expect that countries benefited from the rise of China *where* they were stronger than China compared to *where* they were weaker. We test these predictions indirectly by

[27] A comparison of the within R-squared between the odd Columns of Table 2 and Table 2 reveals that a coercer's WPI fits the data much better than its REP. In addition, while the estimated coefficient of the WPI and REP have similar magnitudes, note that the standard deviation of the WPI is three times as large as that of the REP, implying very different counterfactuals (see Tables E.1 and E.2).

[28] Note that in our specification, we include a policymaker-year fixed effect, α_{pt}. Consequently, when we study the effect of the Weaker Powers Index (the share of power of all weaker coercers) and the coercer's Relative Economic Power (its share of total power), we are using as a reference category the share of power of all stronger coercers. In general, a country's share of power (its REP) should have the same effect as the share of power of all stronger coercers (the reference category). However, if there is any measurement error that leads to misclassifying some weaker coercers as stronger (and vice versa), then we might find a negative and significant effect of a country's REP for given WPI.

[29] For each $c \in C$ this variable is defined as $\rho_t^{c\to p}(\mathbf{E}_{pt}) = 1 + |\{\ell \in C : E_t^{c\to p} > E_t^{\ell\to p}\}|$

[30] Formally, we add $\sum_{k\geq 1} \alpha_k \mathbf{1}\{\rho_{t-1}^{c\to p}(\mathbf{E}_{p,t-1}) = k\}$ to Equation 3, where $\rho(\cdot)$ is defined as in Footnote 29.

[31] To maximize the sample size, for each policymaker-coercer pair we drop observations where the coercer has a power rank different than the mode of its power rank over that policymaker.

studying how these events affected aid and offers relative to different policymakers.

To formalize a test, let $\tilde{c}$ be either China or the Soviet Union (Russia, after 1991). We define $\underline{T}_{\tilde{c}}$ as the first year of the event of interest and $\bar{T}_{\tilde{c}}$ as the last year.[32] Moreover, we let $\mathbf{X}_{cpt}$ be a vector of controls including the log of the trade flow between c and p in period t and the *same-year* Relative Economic Power (REP) of c over p (i.e., $E_t^{c\to p}$). Letting $\ln(Y_{cpt})$ be the log of a specific type of offers received or of aid sent, we estimate

$$\begin{aligned}\ln(Y_{cpt}) =& \beta \times \mathbf{1}\{E_{t-1}^{c\to p} > E_{t-1}^{\tilde{c}\to p}\} \times \mathbf{1}\{\underline{T}_{\tilde{c}} \leq t \leq \bar{T}_{\tilde{c}}\} + \\ &+ \alpha_0 \mathbf{1}\{E_{t-1}^{c\to p} > E_{t-1}^{\tilde{c}\to p}\} + \alpha \mathbf{X}_{cpt} + \alpha_{ct} + \alpha_{pt} + \alpha_{cp} + \varepsilon_{cpt} \end{aligned} \tag{4}$$

With this specification, β captures a Difference in Differences type of variation. The first difference is the change in c's relations where it was stronger than the USSR (or China). The second difference is the change in c's relations where it was weaker than the USSR (or China). A positive coefficient β means that, for the average coercer, the first change is larger than the second. Our model predicts $\beta < 0$ for the collapse of the Soviet Union and $\beta > 0$ for the rise of China.

Table 5 reports the estimated coefficients. Finally, Table 6 performs the same analysis in the subsample of policymaker-coercer pairs where the United States is the coercer.

4.4.1 Discussion of the specification

Just as in our main specification, we included a very restrictive set of fixed effects (see Section D.1 for a detailed discussion). The inclusion of α_{ct} and α_{pt} captures the average effect on each country within each year of the fall of the Soviet Union and the rise of China (for instance, the overall extent of aid that a policymaker needs/that a coercer is willing to send in a given year). Consequently, this specification allows us to focus on heterogeneous effects. For instance, it enables us to study how the average policymaker changes its behavior (its offers) differently with different coercers *in the same year*. Also, how these events lead the average coercer to change its behavior (its aid) differently with different policymakers *in the same year*.

While we see Equation 4 as the sharpest test of our predictions, Section D.1 shows that our results are robust to alternative fixed effects specifications. Finally, as we discuss in Section D.3, our estimated effects do not depend on how we control for trade flows or the Relative Economic Power, suggesting that these variables do not contribute to our results.

[32] We assume that $\underline{T}_{\tilde{c}}$ is 1989 for the fall of the Soviet Union and 2002 for the rise of China. Instead, $\bar{T}_{\tilde{c}}$ is assumed to be 1994 for the the Soviet Union and 2012 (the last year in our sample) for China.

4.4.2 Results

Table 5 confirms the predictions of our theory, finding a large and statistically significant differential effect. Where coercers were stronger than the Soviet Union, their relations worsened compared to where they were weaker; where they were stronger than China, their relations improved compared to where they were weaker.

Moreover, the estimates of Table 5 imply a much larger effect than the one we estimated in the previous section.[33] This finding is consistent with the idea that changes in the power of global geopolitical players such as the Soviet Union or China might have a more considerable effect on the pattern of international relations than changes in the power of the average country.

Finally, Table 6 shows that our model accurately describes the heterogeneous effect of the collapse of the Soviet Union or the rise of China on the relations between the United States and the rest of the world. Again, we find a very large effect for both events. The Fall of the Soviet Union (the rise of China) hurt (benefited) the United States in those regions of the world where it was stronger than the Soviet Union (China) compared to those regions of the world where it was weaker. Additionally, comparing Tables 5 and 6 we see that the United States was affected by these two events more than the average coercer.

4.4.3 Discussion of the empirical mechanisms with an example

The objective of this section is to discuss the mechanism behind our empirical results. To this end, we focus on a simple case study. Consider, for instance, how the fall of the Soviet Union affected the relations between the United States and any Latin American or Eastern European country. In line with our theory, the fall of the Soviet Union had a non-monotonic effect, depending on whether the Soviet Union was the strongest country (as in Eastern Europe) or whether the United States was (as in Latin America). In Eastern Europe, the US took advantage of the collapse of the previously dominant power by extending its network of alliances (Shifrinson, 2020).[34] In Latin America, on the other hand, the collapse of the Soviet Union generated a more relaxed geopolitical environment, which led to an overall reduction in the extent of alignment with the US (Levitsky and Roberts, 2011). Figure 1 shows the diverging political trajectories of Latin America and Eastern Europe. After the fall of the Soviet Union, we observe a drastic and permanent fall in the number of leftist

[33] The Fall of the Soviet Union had an impact of -0.014 on the average WPI ($+0.02$ for the rise of China).

[34] In 1999, the Czech Republic, Hungary, and Poland joined NATO. Later, NATO added Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia and Slovenia (2004), Albania and Croatia (2009), Montenegro (2017), and North Macedonia (2020).

governments in Eastern Europe. In contrast, in Latin America, we see a steady increase.[35]

These patterns are the result of a variety of contributing factors and different mechanisms. For instance, the global powers were ready to make *direct interventions* to secure their interests, thus directly constraining domestic politics in Eastern Europe and Latin America.[36] But sometimes regime change was only *indirectly* linked to the actions of the United States or the Soviet Union. As an example, a coup d'état against a misaligned government is certainly more likely when the perpetrator anticipates the recognition or even support of one of the global powers.[37] Finally, there is a *deterrence mechanism*, which is active even when we observe no regime change. Indeed, politicians might avoid promoting or adopting specific policies that hurt the interests of the global powers if they want to remain in power.

As we focused on standard equilibrium analysis, our theoretical analysis explored the deterrence effect, showing that a rational local ruler who wants to obtain the support of major powers at the lowest possible cost must satisfy a certain type of constraint. However, the crucial aspect of the theory is not the deterrence effect but rather how the constraint on policy-making depends on the distribution of power. Indeed, it would be easy to build an evolution-based model where the other mechanisms also play a role in keeping the equilibrium policies at the constraint identified by our theory.

The critical insight of the theory is that the constraints on domestic policy-making are tighter in periods of more intense geopolitical competition and that countries try to reduce this pressure by aligning themselves with stronger powers. With this in mind, we see that even if the empirical mechanisms are more complex than the deterrence effect, our theory is still helpful to understand the patterns discussed above. For instance, our theory suggests that the rise of the left in Latin America was made possible by the more permissive geopolitical environment that followed the collapse of the Soviet Union. In such an environment, Latin American politicians could start running for office on an explicitly leftist platform without facing the risk of being deposed once in office. As a result, we observed a reduction in the alignment between the average Latin American government and the United States.

[35] Leftism is the extent to which a country is using communism or socialism as its legitimizing ideology (variable `v2exl_legitideolcr_1` from the V-DEM dataset; accessible from https://www.v-dem.net).

[36] Famous examples of direct interventions include the Soviet intervention in Czechoslovakia of 1968 or the US intervention in the Dominican Republic in 1965.

[37] During the Cold War, the United States and the Soviet Union quickly legitimized coups against governments that did not align with their interests. For instance, the United States recognized the 1973 coup d'état that ousted the Chilean president Salvador Allende in favor of general Augusto Pinochet. Similarly, the Soviet Union supported the 1978 coup in Afghanistan against its former ally Daoud Khan.

4.5 Effect of power on imports and exports

As our final empirical exercise, we study whether power affects *imports* and *exports* in a way that our theory can capture.

One possible mechanism is that each country (a policymaker) implements more favorable policies towards those countries (coercers) that have more power over them to keep their support. Another possibility is that more powerful countries can more effectively discourage the adoption of policies that would hurt their economic interests, including reducing their trade flows. In both cases, we should expect stronger countries to import and export more as they obtain more favorable trade policies and thus lower trade frictions.

We study $Flow_{d,t}^{c\to p}$, the flow of either imports or exports (depending on $d \in D$) from a coercer c to a policymaker p in period t. We estimate a standard gravity equation from Anderson and van Wincoop (2003). We assume that bilateral flows (in logs) are a function of the (log of) GDP, (the log of) Population, and the GDP per capita of coercer c and policymaker p. Moreover, we add coercer-policymaker pair fixed effects, year fixed effects, and the lag of the bilateral flow.[38] We collect these variables in the vector $\mathbf{X}_{cpt}$. To assess the relevance of our model, we also add the (lagged) WPI of c over p and the lagged relative economic power (REP) of c over p, i.e. $E_{t-1}^{c\to p}$.[39] Specifically, we consider the following:

$$ln(Flow_{d,t}^{c\to p}) = \beta_1 WPI_{t-1}^{c\to p}(\mathbf{E}_{p,t-1}) + \beta_2 E_{t-1}^{c\to p} + \mathbf{\Gamma}'\mathbf{X}_{cpt} + \varepsilon_{cpt} \tag{5}$$

The problem with directly estimating this equation is the endogeneity. Indeed, our measure of power, economic power, is calculated from (past) trade flows. To address this, we apply a 2SLS estimation. We first identify variations in economic power that are not directly linked to trade policies. We then use such variations to assess the effect of power on imports and exports. The following section discusses this strategy in greater detail.

4.5.1 Empirical strategy: dealing with endogeneity

In the first stage, we use variations in the distribution of the coercers' GDP to predict changes in the distribution of the relative economic power of each coercer ($\mathbf{E}_{p,t-1}$). We let $\mathbf{GDP}_t$ denote the global distribution of GDP in period t, and let GDP_t^{tot} be the world GDP, i.e., the sum of every country's GDP.

[38] Introducing the lag of the outcome leads to Nickel bias, but as justified by Berger et al. (2013) the benefits of introducing the lagged outcome in this setting are likely to outweigh the costs. In our setting, Nickel bias will be less than -0.01, as $T \approx 70$, and the autoregressive component is close to 0.5.

[39] Variables that affect bilateral trade flows are usually introduced in the estimating equations in a log-linear fashion. See, for instance, Berger et al. (2013).

Using a country's GDP as a measure of its economic power, we can define a country's relative economic power (REP) based on GDP as follows:

$$E_{t-1}^{c\to p}(\mathbf{GDP}_{t-1}) = \frac{GDP_{c,t-1}}{GDP_{t-1}^{tot}}$$

Based on this, we can define the GDP-based WPI of c over p as the share of global GDP of all countries (except p) that have less GDP than c:

$$WPI_{t-1}^{c\to p}(\mathbf{GDP}_{t-1}) = \sum_{\ell\neq p: GDP_{\ell,t-1}<GDP_{c,t-1}} E_{t-1}^{\ell\to p}(\mathbf{GDP}_{t-1})$$

Note that c's GDP is in the denominator of its GDP-based WPI, so any change in its GDP that does not affect its GDP rank will decrease its GDP-based WPI.

Given these definitions and Equation 5, we can express the two stages of our strategy:

First stages:

$$WPI_{t-1}^{c\to p}(\mathbf{E}_{p,t-1}) = \theta_1 WPI_{t-1}^{c\to p}(\mathbf{GDP}_{t-1}) + \theta_2 E_{t-1}^{c\to p}(\mathbf{GDP}_{t-1}) + \mathbf{\Gamma}_1'\mathbf{X}_{cpt} + \varepsilon_{cpt} \tag{6}$$

$$E_{t-1}^{c\to p} = \theta_3 WPI_{t-1}^{c\to p}(\mathbf{GDP}_{t-1}) + \theta_4 E_{t-1}^{c\to p}(\mathbf{GDP}_{t-1}) + \mathbf{\Gamma}_2'\mathbf{X}_{cpt} + \varepsilon_{cpt} \tag{7}$$

Second stage:

$$ln(Flow_{d,t}^{c\to p}) = \beta_1 \widehat{WPI}_{t-1}^{c\to p}(\mathbf{E}_{p,t-1}) + \beta_2 \widehat{E}_{t-1}^{c\to p} + \mathbf{\Gamma}'\mathbf{X}_{cpt} + \varepsilon_{cpt} \tag{8}$$

In the second stage (Equation 8), $\widehat{WPI}_{t-1}^{c\to p}(\mathbf{E}_{p,t-1})$ and $\widehat{E}_{t-1}^{c\to p}$ are the fitted values from the two first stage regressions (Equations 6 and 7), and $\mathbf{X}_{cpt}$ is the vector including the standard gravity controls that we discussed earlier.

In the spirit of the analysis of Section 4.2, we will assess the relevance of our theory with three empirical exercises. First, we focus on the effect of the WPI omitting the REP (i.e., fixing $\theta_2 = \beta_2 = 0$). Second, we focus on the effect of the relative economic power by omitting the WPI (i.e., fixing $\theta_1 = \beta_1 = 0$). Finally, we carry out the entire analysis outlined above.

The crucial disadvantage of using GDP to measure economic power is its unilaterality: a coercer has the same power over every policymaker in the same period. Consequently, we can only estimate β from variations within each coercer-policymaker pair and relative to that year's overall average of all coercer-policymaker pairs. Fortunately, however, we can rely on a well-established literature to guide our choice of control variables.

4.5.2 Results

Table 7 summarizes the results of the strategy described in Section 4.5.1. Columns (1) and (3) study the effect of the Weaker Powers Index (WPI) on imports and exports without controlling for the relative economic power (REP), columns (2) and (4) study the effect of the REP without controlling for the WPI, and, finally, columns (3) and (5) estimate the full model described by Equations 7, 6, and 8.

Comparing column (2) with (3) and column (5) with (6), we find again that a country's relative economic power does not capture the effects of power on bilateral relations. Instead, we find that the Weaker Powers Index has a large and significant impact on both imports and exports. A standard deviation increase in the lagged Weaker Powers Index (a change of 0.06) leads to a 20% increase in imports and exports. When we also control for the coercer's REP, this number becomes larger than 30%. Additionally, note that the process for imports and exports features an autoregressive component whose coefficient is around 0.5, implying that the long-run effect of a one standard deviation increase in the WPI is at least twice as large as the ones stated.

4.6 Robustness: definitions, specifications, inference

In Appendix D we perform several robustness checks to confirm that the Weaker Powers Index is an important empirical determinant of international interactions and trade. This section summarizes some of these exercises.

Outcome definitions. As discussed in Appendix C, before analyzing our outcomes derived from GDELT, we apply a transformation to avoid dropping the observed zeros when taking the log. In Section D.4 we show that our results do not change when we avoid any transformation or when we make other standard transformations.

Fixed effects. Section D.1 shows that all the results are robust to every fixed effect specification that is less stringent than our baseline specification, but also a specification that is more stringent than our baseline. Panel D in Table D.3 shows that the results are robust to the inclusion of time-varying fixed effect for each pair of geopolitical regions.[40] As we discuss in Section D.1, this exercise shows that our results do not depend on the formation or the dissolution of supranational institutions (e.g., the European Union or the Soviet Union).

Independent Variables and Additional Controls. Section D.3 studies relatively

[40]The netting out of all time-varying characteristics of a coercer-policymaker pair (say c and p) that are the same across other coercer-policymaker pairs (say c' and p'), where coercers c and c' are in the same geopolitical region S, and policymakers p and p' are also in the same geopolitical region S'.

minor deviations from our baseline specification. It shows that our results do not change when we omit trade flows, condition on the same-year REP, or study the same-year rather than lagged WPI. Moreover, Section D.3 shows that results are robust to the inclusion of the lagged outcome.[41] Finally, Section D.6 shows that the results do not change when we study the number of offers received conditioning on the number of offers sent, aid sent, or both. Similarly, results do not change when we study aid sent, conditioning on the number of offers sent, received, or both. These last findings justify our focus on distinct outcomes as cross-validation of the theory.

Standard Errors. Section D.5 shows that the statistical significance of our estimates is robust to alternative standard error specifications. In our baseline analysis, we use two-way clustered standard errors (coercer and policymaker). This choice does not account for the possibility of cross-country pairs correlation in the errors, which is likely if our model is correct.[42] Tables D.7 and Table D.8 show that our inference is robust to accounting for cross-observations dependence, as we show our coefficients to be significant even when we adopt three-way clustered standard errors (adding the time dimension), or Driscoll-Kraay standard errors (Driscoll and Kraay, 1998).[43]

4.7 Validation: power, outcomes, subsamples

Appendix E validates our results by replicating the analysis with an alternative measure of power, other outcomes from GDELT and restricting the analysis to some subsamples.

Alternative measure of power. To make our baseline analysis as transparent and straightforward as possible, we focused on power generated by the value of trade flows. Thus, our analysis ignores military power and the possibility that different trade compositions (e.g. exporting raw materials rather than luxury goods) with the same value can generate different power levels. To address these limitations, in a validation exercise, we replicate our analysis with an alternative measure of power: the Formal Bilateral Influence Capability (FBIC).[44] Such variable is a composite measure of power, based on arms transfers, aid dependence, membership in intergovernmental organizations, and other similar features (Moyer et al., 2018). Interestingly, the FBIC has a relatively low correlation with our measure of economic

[41] Results are robust even when allowing outcome lags to have a time-varying effect, a coercer-specific effect, or a policymaker-specific effect.

[42] Recall that the key testable prediction of our model is that bilateral outcomes depend on third-parties characteristics.

[43] As discussed in Section D.5, unlike three-way clustering (by coercer, policymaker and year), Driscoll-Kraay standard errors allow for a very general form of cross-country dependence *and* auto-correlation in such cross-country component. In our robustness checks, we allow for up to seven lags of cross-country dependence.

[44] This measure is freely accessible from https://korbel.du.edu/fbic.

power (see Tables E.1 and E.2). Still, we successfully replicate all of our results using the FBIC, finding similar (if a bit larger) counterfactual exercises.

Alternative outcomes from GDELT. In our main analysis, we focused on offers received and aid sent to measure the value that a coercer obtains from its relation with a policymaker. In Section E.3, we show that we can replicate our analysis with another type of outcome: *agreements*. As we discuss in Section E.3, agreements measure the initiation, resumption, improvement, or expansion of cooperation in a particular domain (economic, military, diplomatic, and judiciary), the ratification, signature, and finalization of an agreement or treaty, regardless of its nature (political agreement). Tables E.6, E.7, and E.8 replicate our analysis for these outcomes, providing further supporting evidence to the role of the WPI in shaping the pattern of international cooperation.

Subsamples. Our final validation exercise replicates our analyses in different subsamples of interest. In line with our interpretation of the model describing how major powers affect domestic decision-making, we focus on subsamples where only major powers can be coercers, and they cannot be policymakers. Section E.3 shows that our results hold for various definitions of major powers. In the most restrictive definition of major powers, we consider only 8 coercers and less than 15% of our entire sample. In the least restrictive case, we study 40 coercers (and 30% of our sample).[45] Finally, Section E.3 replicates the analysis focusing on asymmetric relations: country pairs where the coercer has more power over the policymaker than vice versa.

5 Future directions and model's extensions

One of the main objectives of this paper is to provide an empirically-grounded foundation to study various applications related to geopolitical competition. We now discuss some of these applications highlighting the unique perspective offered by our model.

5.1 Great Power Wars and arms' races

The first natural extension of our model would be to endogenize the distribution of power. For instance, we could study major powers (coercers) who invest in their coercive capacities or can spend resources to harm the coercive capacities of other major powers (e.g., with a conflict).

Our model provides a unique perspective on this theme because the payoff of a country

[45] We define as major powers those countries that are ever in the top 5, 10, 20, or 30 in terms of GDP. See Table E.9 for a list of all countries that qualify as coercers and the sample size of each subsample.

jumps up (down) when its power rank increases (decreases). As a first implication, note that arms race are very likely occurrences in our model: the incentive to invest in power crucially depends on whether other countries invest in power, as countries compete to obtain higher power ranks. Second, within our model, countries might be willing to invest resources into weakening their competitors, e.g., participating in costly conflicts that can only destroy the opponent's resources.

In addition, note that our model would make predictions on the conflict pattern that are very different from the standard wisdom that conflicts occur when strong countries find it profitable to prey on small ones. First, within our model, the source of tension is asymmetric but in the opposite direction: conflicts emerge from the desire of a country to overcome a stronger one. Thus, we should expect countries to display aggression towards stronger ones, a puzzling pattern that has spurred an entire literature in international relations (Paul, 1994). Second, major powers should be more likely to fight when they are more symmetric, as in that case, a small change in the distribution of power (a less costly conflict) can lead to a change in rank, thus a large change in the equilibrium payoff. Again, the idea that power parity may be conducive to war is at odds with the standard theory but not with the evidence on both historical and modern conflicts (Organski and Kugler, 2015; Lemke, 2002; Allison, 2017; Renshon, 2017).

5.2 Geopolitical polarization and strategic protectionism

Another natural way to endogenize the distribution of power is to take the perspective of a local power (a policymaker) who can change its relative dependence on the various major powers (e.g., with its trade policies).

In this case, we can show that when the local ruler has the opportunity to redirect its trade away from one major power and towards another one, it would always want to increase its relative dependence on the more powerful of the two. In other words, our model introduces a force that pushes local rulers to prefer polarization to diversification. Such finding is consistent with episodes of geopolitical polarization such as the Cold War: the formation of separate blocs that barely interact with one another.

Finally, this extension would highlight that countries have an incentive to reduce their overall exposure towards major powers (e.g., reduce trade volumes), speaking to the existence of *strategic industries* that receive protection from foreign competition.

5.3 Ideological competition

In our model, we take a reduced-form perspective assuming that local rulers send transfers to major powers. But these relationships are more complicated in the real world. For instance, there might be a higher political cost in aligning with a major power relative to another one, depending on whether such major power is viewed with favor or disfavor by the local population. Thus, in an extension, it would be natural to assume heterogeneity in this type of cost and to assume that major powers can invest in reducing it (e.g., with ideological and cultural propaganda).

Importantly, this type of heterogeneity should reflect in the equilibrium transfers. Indeed, recall from Section 3.4 that the local ruler is indifferent on which major power to favor when they have the same power. Adding cost heterogeneity would break the indifference and lead the local ruler to align itself with the least costly of the two powers. But this implies an incentive for major powers to invest in this dimension, which can explain why ideological competition is another important aspect of geopolitical rivalries.

5.4 International institutions

While we expanded the model to include multiple periods, our analysis remained effectively static, as we assumed that countries are not patient enough to play the typical cooperative strategies that might emerge in repeated games. Relaxing this assumption would open the door to various complexities. However, it would also allow us to study institutional arrangements that might reflect this type of strategies. For instance, in our model, two major powers could increase their payoff by credibly committing to act together when pressuring local rulers. This idea adds a geopolitical explanation as to why countries might be willing to join their forces by creating supranational organizations that can coordinate their behavior.

Moreover, suppose countries anticipate that the natural state of international relations generates payoffs that depend on the power rank (as in Section 3). Additionally, suppose that they expect that this aspect fuels infighting (as discussed in Section 5.1). In that case, they might develop institutions to change the game's rules, change the payoff structure, and thus reduce the tensions between them. In our model, the dependence on the power rank emerges from the desire of local rulers to policymaker their policies to major powers. Then, it is natural to expect that a more rule-based international system, a strengthening of non-discriminatory clauses on trade, and an increased focus on multilateral (rather than bilateral) approaches are all steps towards a more peaceful future.

6 Conclusions

This paper studies how the distribution of power shapes the international system. Our main theoretical result is that the equilibrium payoff of each major power is not determined by its relative power, but by the power share of all weaker major powers: a variable we call the *Weaker Powers Index (WPI)*. Specifically, greater WPI implies higher payoff. As we discuss, this simple prediction produces rich enough dynamics to resolve seemingly unrelated international relations puzzles. Importantly, the WPI, a one-dimensional function of the distribution of power, summarizes all these dynamics, producing straightforward empirical predictions.

Specializing the theory, we predict that when a country's WPI increases, it should have better economic, military, and diplomatic relations, send more economic, military, and humanitarian aid, and export and import more. We confirm the empirical validity of each of these predictions by testing them with bilateral data on international interactions and trade. Additionally, we show that the WPI plays a much more fundamental role than a country's own power. Indeed, controlling for a country's WPI, the estimated effect of a country's power becomes insignificant or even negative. Moreover, consistently with the theory, we show that the fall of the Soviet Union hurt the United States (and the average major power) where it was weaker than the USSR relative to where it was stronger. Additionally, we show that the United States (and the average major power) has been benefiting from the rise of China where it is stronger than China relative to where it is weaker. All in all, this empirical analysis strongly supports the theory and the role of the WPI in shaping modern international relations.

Finally, we show that our theoretical framework can be extended in various directions, promising new perspectives on a variety of themes: from great power rivalries, conflicts, geopolitical polarization, the role of ideology in great power competition, and how changes in the institutional setting feed into each of these dimensions.

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Figures and Tables

Table 1: description and summary statistics of outcomes from the GDELT dataset

Variable	Description of the interaction [CAMEO category]	μ	σ
Economic Offer	Offer/promise/agree to, or otherwise indicate willingness or commitment to engage in or expand economic ties [0311]. Offer/promise/agree to, or otherwise indicate willingness or commitment to engage in or expand material cooperative exchange not otherwise specified [031].	0.81	0.30
Military Offer	Offer/promise/agree to, or otherwise indicate willingness or commitment to engage in or expand military ties [0312].	0.88	0.05
Diplomatic Offer	Offer/promise/agree to, or otherwise indicate willingness or commitment to expand diplomatic ties or cooperation [032].	0.88	0.04
Economic Aid	Extend/provide monetary aid and financial guarantees, grants, gifts and credit [071]. All provisions, extension of material aid, not otherwise specified [070].	0.97	1.78
Military Aid	Extend/provide military and police assistance including arms and personnel [072].	0.81	0.21
Humanitarian Aid	Extend/provide humanitarian aid, mainly in the form of emergency assistance [073].	0.82	0.18

Table 2: effect of the Weaker Powers Index (WPI) on International Interactions

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
$WPI^{c\to p}$ (lag)	1.90***	1.11***	1.02***	1.50***	0.71***	1.15***
	[0.27]	[0.24]	[0.21]	[0.23]	[0.19]	[0.21]
Trade (ln)	0.01	0.00	0.00	-0.00	0.00	-0.00
	[0.01]	[0.01]	[0.003]	[0.004]	[0.004]	[0.005]
Observations	281,190	281,298	253,732	281,305	281,305	281,305
Adj. R-2	0.47	0.27	0.16	0.60	0.43	0.36
Within R-2	0.005	0.001	0.001	0.004	0.001	0.002

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The Weaker Powers Index (WPI) of c over p is the share of total (economic) power over p controlled by every coercer with less power over p than c. The outcomes are the log of the number of times over a year t in which country p sends Economic, Military, or Diplomatic Offers to country c, or in which country c sends Economic, Military, or Humanitarian aid to country p. All specifications control for the log of the trade flow between p and c and include coercer-policymaker pair fixed effects, as well as time-varying fixed effects for each coercer and for each policymaker. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 3: how the inclusion of a coercer's Weaker Powers Index (WPI) changes the estimated effect of its Relative Economic Power (REP)

Table 3.A	$Offers^{p \to c}$					
	Economic		Military		Diplomatic	
	(1)	(2)	(3)	(4)	(5)	(6)
$WPI^{c \to p}$ (lag)		2.16***		1.18***		1.05***
		[0.32]		[0.25]		[0.25]
$REP^{c \to p}$ (lag)	1.91***	-1.44***	1.47***	-0.36	1.48***	-0.17
	[0.70]	[0.54]	[0.40]	[0.50]	[0.39]	[0.43]
Trade (ln)	0.02***	0.01	0.01	0.00	0.01**	0.00
	[0.005]	[0.01]	[0.01]	[0.01]	[0.004]	[0.003]
Observations	281,190	281,190	281,298	281,298	253,732	253,732
Adj. R-2	0.46	0.47	0.27	0.27	0.16	0.16
Within R-2	0.001	0.005	0.003	0.001	0.000	0.001

Table 3.B	$Aid^{c \to p}$					
	Economic		Military		Humanitarian	
	(1)	(2)	(3)	(4)	(5)	(6)
$WPI^{c \to p}$ (lag)		1.70***		0.81***		1.25***
		[0.26]		[0.27]		[0.27]
$REP^{c \to p}$ (lag)	1.53**	-1.10*	0.74**	-0.51	1.44**	-0.49
	[0.68]	[0.56]	[0.36]	[0.55]	[0.61]	[0.64]
Trade (ln)	0.01**	-0.00	0.01*	0.003	0.01	-0.001
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.005]
Observations	281,305	281,305	281,305	281,305	281,305	281,305
Adj. R-2	0.58	0.58	0.43	0.43	0.36	0.36
Within R-2	0.001	0.004	0.0002	0.001	0.0003	0.002

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The Weaker Powers Index (WPI) of c over p is the share of total economic power over p of all coercers with less power over p than c. The Relative Economic Power (REP) of c over p is c's share of total economic power over p. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c (Table 3.A), or in which country c sent Economic, Military, or Humanitarian aid to p (Table 3.B). All specifications control for the log of trade between p and c, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 4: Weaker Powers Index (WPI) vs. Relative Economic Power (REP) including power Rank fixed effects or in subsamples with no change in rank

Table 4.A	$Offers^{p \to c}$					
	Economic		Military		Diplomatic	
	(1)	(2)	(3)	(4)	(5)	(6)
$WPI^{c \to p}$ (lag)	2.75***	2.62***	1.47***	1.64***	1.48***	2.60***
	[0.50]	[0.53]	[0.35]	[0.49]	[0.33]	[0.70]
$REP^{c \to p}$ (lag)	-1.39***	0.18	-0.39	-0.18	-0.24	0.31
	[0.50]	[0.72]	[0.50]	[0.86]	[0.47]	[0.87]
Trade flow (ln)	0.00	-0.01	0.00	0.01	0.00	0.01
	[0.004]	[0.02]	[0.004]	[0.02]	[0.003]	[0.02]
Rank fixed effects	Yes	No	Yes	No	Yes	No
Rank = Modal Rank	No	Yes	No	Yes	No	Yes
Observations	281,179	42,164	281,287	42,189	253,716	35,549
Adj. R-2	0.47	0.53	0.27	0.28	0.16	0.10
Within R-2	0.004	0.003	0.001	0.001	0.001	0.002

Table 4.B	$Aid^{c \to p}$					
	Economic		Military		Humanitarian	
	(1)	(2)	(3)	(4)	(5)	(6)
$WPI^{c \to p}$ (lag)	2.15***	2.18***	0.82**	0.93*	1.56***	1.81***
	[0.40]	[0.49]	[0.37]	[0.51]	[0.42]	[0.57]
$REP^{c \to p}$ (lag)	-0.82*	0.41	-0.57	0.04	-0.50	-0.05
	[0.48]	[0.50]	[0.51]	[0.96]	[0.49]	[0.83]
Trade flow (ln)	-0.00	-0.01	0.00	0.01	-0.00	-0.01
	[0.003]	[0.01]	[0.003]	[0.01]	[0.004]	[0.02]
Rank fixed effects	Yes	No	Yes	No	Yes	No
Rank = Modal Rank	No	Yes	No	Yes	No	Yes
Observations	281,292	42,228	281,292	42,228	281,292	42,228
Adj. R-2	0.59	0.65	0.43	0.44	0.36	0.38
Within R-2	0.003	0.004	0.0004	0.0003	0.001	0.001

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. Odd columns include economic power rank fixed effect; even columns restrict the samples to cases where the economic power rank of c over p equals its modal economic power rank over p. The Weaker Powers Index (WPI) of c over p is the share of total economic power over p of all coercers with less power over p than c. The Relative Economic Power (REP) of c over p is c's share of total economic power over p. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c (Table 4.A), or in which country c sent Economic, Military, or Humanitarian aid to p (Table 4.B). All specifications control for the log of trade between p and c, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 5: differential impact of USSR collapse (China rise) on the average coercer comparing *where* it is stronger than USSR (China) with *where* it is weaker

	$Offers^{p \to c}$			$Aid^{c \to p}$		
	Econ (1)	Mil (2)	Dip (3)	Econ (4)	Mil (5)	Hum (6)
Panel A: fall of USSR						
Stronger vs Weaker	-0.31***	-0.20***	-0.18***	-0.34***	-0.16***	-0.28***
	[0.04]	[0.07]	[0.03]	[0.04]	[0.05]	[0.05]
Observations	287,895	287,999	261,003	287,904	287,904	287,904
Adj. R-2	0.45	0.26	0.15	0.58	0.42	0.35
Within R-2	0.002	0.001	0.001	0.003	0.001	0.001
Panel B: rise of China						
Stronger vs Weaker	0.29***	0.20***	0.14***	0.32***	0.14***	0.27***
	[0.05]	[0.06]	[0.03]	[0.04]	[0.03]	[0.05]
Observations	288,829	288,936	261,594	288,824	288,824	288,824
Adj. R-2	0.45	0.27	0.15	0.58	0.43	0.35
Within R-2	0.004	0.001	0.001	0.005	0.001	0.003

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The variable Stronger vs Weaker estimates β of Equation 4. This coefficient captures the differential effect on each coercer c of the fall of the Soviet Union (Panel A) or of the rise of China (Panel B) comparing the outcomes related to policymakers over which c was stronger than the USSR (or China) with those policymaker over which it was weaker than the USSR (or China). Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c (Table 4.A), or in which country c sent Economic, Military, or Humanitarian aid to p (Table 4.B). All specifications control for the log of trade between p and c, the Relative Economic Power (REP) of c over p, i.e. c's share of total economic power over p, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 6: differential impact of USSR collapse (China rise) on the United States comparing *where* the USA is stronger than USSR (China) with *where* it is weaker

	$Offers^{h \to USA}$			$Aid^{USA \to h}$		
	Econ (1)	Mil (2)	Dip (3)	Econ (4)	Mil (5)	Hum (6)
Panel A: fall of USSR						
Stronger vs Weaker (USA only)	-0.42***	-0.80***	-0.14	-0.33***	-0.38***	-0.58***
	[0.07]	[0.10]	[0.10]	[0.06]	[0.10]	[0.09]
Observations	5,256	5,266	3,499	5,281	5,281	5,281
Adj. R-2	0.61	0.43	0.24	0.76	0.50	0.50
Within R-2	0.01	0.02	0.002	0.02	0.005	0.01
Panel B: rise of China						
Stronger vs Weaker (USA only)	0.86***	1.19***	0.25	0.79***	0.26*	0.76***
	[0.11]	[0.19]	[0.17]	[0.09]	[0.14]	[0.14]
Observations	5,265	5,275	3,503	5,290	5,290	5,290
Adj. R-2	0.61	0.42	0.24	0.76	0.50	0.49
Within R-2	0.02	0.01	0.004	0.02	0.003	0.01

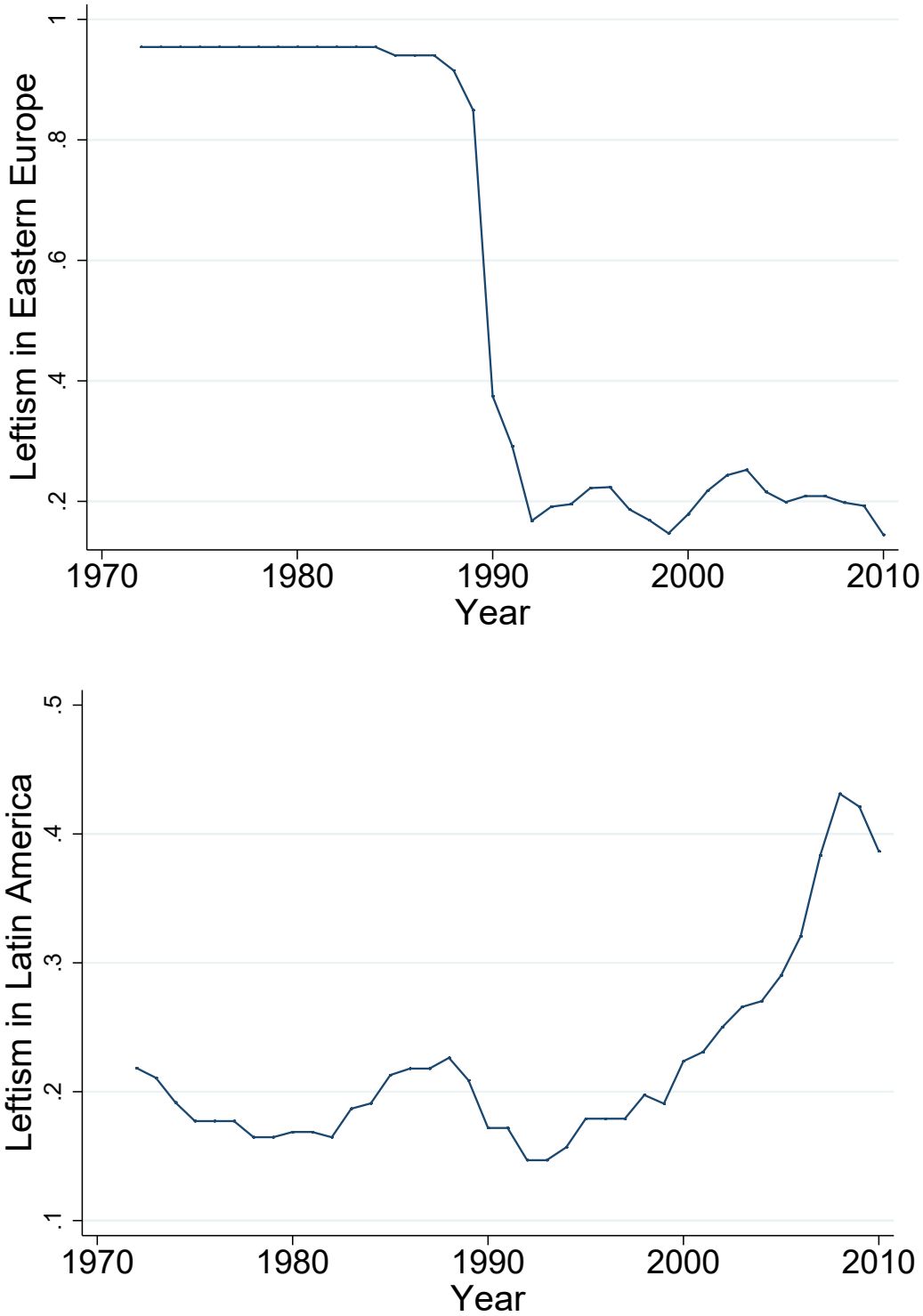
Note: the unit of observation is a US-policymaker (US, p) pair in a given year. The variable Stronger vs Weaker estimates β of Equation 4 restricting $c = US$. This coefficient captures the differential effect on the US of the fall of the Soviet Union (Panel A) or of the rise of China (Panel B) comparing the outcomes related to those policymakers over which the US was stronger than the USSR (or China) with those where it was weaker than the USSR (or China). Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to the US (Table 4.A), or in which the US sent Economic, Military, or Humanitarian aid to p (Table 4.B). All specifications control for the log of trade between p and the US, the US's Relative Economic Power (REP) over p, i.e. the share of total economic power over p controlled by the US, policymaker-US fixed effects, and year fixed effects. Standard errors (in parenthesis) are robust. Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 7: comparison between effects of Weaker Powers Index (WPI) and Relative Economic Power (REP) on imports and exports in Gravity Model

	c's Imports from p (ln)			c's Exports to p (ln)		
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{WPI}^{c\to p}$ (lag)	3.33*		5.06**	3.26**		4.43***
	[1.86]		[2.50]	[1.44]		[1.66]
$\widehat{REP}^{c\to p}$ (lag)		-0.981	-11.45		1.07	-7.93
		[9.35]	[9.79]		[8.22]	[4.92]
Observations	813,093	813,093	813,093	813,091	813,091	813,091
Adj. R-2	0.32	0.32	0.32	0.36	0.35	0.35
K-Paap F	9.08	9.53	49.12	9.06	9.84	52.74

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The table reports 2SLS estimates, where the second stage uses (lagged) trade flows to measure power and the first stages uses the distribution of GDP to measure power (see Equations 7, 6). The Weaker Powers Index (WPI) of country c (coercer) over country p (policymaker) is the share of total economic power over p of all coercers with less power over p than c. The Relative Economic Power (REP) of c over p is c's share of total economic power over p. All specifications control for coercer-policymaker fixed effects, year fixed effects, the lag of the outcome, the GDP (log), the population (log), and the GDP per capita of both c and p. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Figure 1: Diverging political paths for Eastern Europe and Latin America



Note: the two figures represent the time series plots of leftism in the average Latin American government (bottom) and Eastern European government (top). Leftism is variable *v2exl_legitideolcr_1* from the V-DEM dataset (accessible from https://www.v-dem.net). This variable determines the extent to which a country's government is using communism or socialism as its legitimizing ideology.

Appendices

A Proofs

Proof of Theorem 1. Consider a robust cost-minimizing offer $\hat{\mathbf{B}}$. Without loss of generality, relabel the coercers so that $i > j$ if $\hat{B}_i > \hat{B}_j$ (arbitrarily if $\hat{B}_i = \hat{B}_j$). Let $n = |C|$ be the label of the coercer that received the highest offer, let 1 be the label of the coercer with the smallest offer, and let $n+1$ be the label of the policymaker. Note that a robust cost-minimizing offer must be such that the following condition holds:

$$\left[1 - F\left(\frac{\sum_{j=1}^{n-1} W_{n-1}}{\sum_{j=1}^{n+1} W_j}\right)\right] \hat{B}_n = \kappa \tag{9}$$

Any smaller $\hat{B}_n$ would give up robustness, as any such $\hat{\mathbf{B}}$ would be consistent with an SPE in which every coercer oppose the policymaker. Any larger $\hat{\mathbf{B}}$ would not be cost-minimizing. Now, given that any cost-minimizing robust offer must satisfy the above condition, we know that any robust cost-minimizing offer must also satisfy the following requirement:

$$\left[1 - F\left(\frac{\sum_{j=1}^{n-2} W_j}{\sum_{j=1}^{n+1} W_j}\right)\right] \hat{B}_{n-1} = \kappa \tag{10}$$

Any smaller $\hat{B}_{n-1}$ would give up robustness, as any such $\hat{\mathbf{B}}$ would be consistent with an SPE in which every coercer except n oppose the policymaker. However, if $\hat{\mathbf{B}}$ satisfies Equation 9 (which must be true as $\hat{\mathbf{B}}$ is robust and cost-minimizing), then any greater $\hat{B}_{n-1}$ would not be cost-minimizing.

Iterating this argument, we see that any robust cost-minimizing offer must be such that $[1 - F(0)]\hat{B}_1 = \kappa$, and for every $c \in C$ we have:

$$\left[1 - F\left(\frac{\sum_{j=1}^{c-1} W_c}{\sum_{j=1}^{n+1} W_c}\right)\right] \hat{B}_c = \kappa \tag{11}$$

The argument so far showed that any cost-minimizing robust offer can be constructed by relabeling coercers (assigning ranks) and making the smallest offer that induces each coercer to support the policymaker when all and only policymakers with a greater label support the policymaker. We are left with showing that that $B_1 > B_2$ if $W_1 > W_2$, i.e. that higher labels are assigned to stronger coercers. For notational convenience, let $w_j = \frac{W_j}{\sum_{j=1}^{n+1} W_c}$. Given the above characterization, we can derive the total cost associated with any offer $\hat{B}$ that satisfies

the conditions above. Such total cost takes the following form:

$$\sum_{j=2}^{n} \hat{B}_c = \frac{\kappa}{[1-F(0)]} + \frac{\kappa}{[1-F(w_1)]} + \frac{\kappa}{[1-F(w_1+w_2)]} + ... + \frac{\kappa}{[1-F(w_1+w_2+..+w_n)]}$$

Because $F(\cdot)$ is strictly increasing, this expression implies that if there are two coercers i and j such that $i < j$ but $w_i > w_j$ then the policymaker could reduce its total costs by switching the offers that it makes to them. By construction, such deviation would not have effect on the robustness of the offers, as this total cost structure already reflects the necessary conditions summarized by Equation 11. This leads to the conclusion that if $W_i > W_j$ then it must be that $B_i > B_j$.

■

Proof of Propositions 1, 2, 3, and 4. Restrict attention to distributions of power where there are no ties, i.e., with $W_c = W_{c'}$ if and only if $c = c'$. From Theorem 1 we know that this restriction implies that there is a unique robust cost-minimizing offer $\hat{\mathbf{B}}$. From Equation 11 we know that, in such equilibrium, each c receives the following offer

$$\hat{B}_c = \frac{\kappa}{1 - F\left(\frac{\sum_{\ell:W_\ell<W_c} W_\ell}{\sum_{j\in C} W_j + W_p}\right)} \tag{12}$$

First note that the distribution of power only enters each $\hat{B}_c$ via the argument of $F(\cdot)$. The first part of Proposition 3 thus follows from the fact that we defined the WPI of a country as exactly the argument of $F(\cdot)$, i.e. $\frac{\sum_{\ell:W_\ell<W_c} W_\ell}{\sum_{j\in C} W_j + W_p}$. The other part of Proposition 3 follows form the observation that $\hat{B}_c$ is increasing in $F\left(\frac{\sum_{\ell:W_\ell<W_c} W_\ell}{\sum_{j\in C} W_j + W_p}\right)$ and $F(\cdot)$ is increasing, thus $\hat{B}_c$ is increasing in the WPI.

With this in mind, to establish Propositions 1 and 2 it is enough to show that the stated comparative statics hold relative to the WPI. Proposition 1 follows immediately from the WPI being increasing in the power of weaker countries and decreasing in the power of stronger ones. Propositions 2 follows from the observation that a country's own power is at the denominator of its WPI.

Finally, for what concerns Proposition 4, note that once we assume that $F(w) = 1 - e^{-\lambda w}$, then the equilibrium offer is $\hat{B}_c = \kappa e^{\lambda \frac{\sum_{\ell:W_\ell<W_c} W_\ell}{\sum_{j\in C} W_j + W_p}}$. Taking the natural logarithm and adjusting the notation leads to the result stated in Propositions 4.

■

B Foundation of the empirical specifications in Sections 4.3 and 4.4

The objective of this Section is to specialize the theory to provide a foundation for the empirical specifications adopted in Sections 4.3 and 4.4. Specifically, we wish to justify why we separately estimate the effect of the WPI (or the events in 4.4) on each type of offer or aid, and why we focus on a log-linear relation between them.

Recall that we denoted the vector of types offers as $(O_{d,t}^{p\to c})_{d\in D}$ and the vector of types of aid as $(A_{d,t}^{c\to p})_{d\in D}$ and that we defined $\hat{B}_t^{p\to c}$ as the equilibrium transfer that country p sends country c in period t. We start our discussion from $(O_{d,t}^{p\to c})_{d\in D}$ and then we move to $(A_{d,t}^{c\to p})_{d\in D}$.

B.1 Offers

As anticipated, we interpret $(O_{d,t}^{p\to c})_{d\in D} \in \mathbb{R}_+^n$ as a costly input-vector that generates $\hat{B}_t^{p\to c}$.

Specifically, letting $C_d > 0$, $\gamma_d \geq 1$, $Z_d > 0$ and $\zeta_d > 0$ such that $\sum_{d\in D} \zeta_d = 1$ we assume that $(O_{d,t}^{p\to c})_{d\in D} \in \mathbb{R}_+^n$ results from the following optimization problem:

$$\min_{(O_{d,t}^{p\to c})_{d\in D}} \sum_{d\in D} C_d \left(O_{d,t}^{p\to c}\right)^{\gamma_d} \quad \text{s.t.} \quad \prod_{d\in D} Z_d \left(O_{d,t}^{p\to c}\right)^{\zeta_d} = \hat{B}_t^{p\to c} \tag{13}$$

The restrictions on the parameters guarantee that the first order conditions are necessary and sufficient. Rearranging the first order condition relative to type d and d', we can find two parameters $\Theta_{d\tilde{d}} > 0$ and $\theta_{d\tilde{d}} > 0$ such that for any $d' \in D$ and $d \in D$ we get:

$$O_{\tilde{d},t}^{p\to c} = \Theta_{d\tilde{d}} \left(O_{d,t}^{p\to c}\right)^{\theta_{d\tilde{d}}}$$

Exploiting this condition, we can write every type of offer as a function of a single type of offer d and thus we can write the constraint as a function of type-d offers. Doing so leads to the conclusion that we can find parameters $\tilde{\Theta}_{d\tilde{d}} > 0$ and $\tilde{\theta}_{d\tilde{d}} > 0$ so that the following holds:

$$\prod_{\tilde{d}\in D} \Theta_{d\tilde{d}} \left(O_{d,t}^{p\to c}\right)^{\theta_{d\tilde{d}}} = \hat{B}_t^{p\to c}$$

Taking the natural logarithm and rearranging, we can derive the following condition for some parameters $s_d^O > 0$ and $K_d^O \in \mathbb{R}$:

$$K_d^O + s_d^O \ln\left(O_{d,t}^{p\to c}\right) = \ln\left(\hat{B}_t^{p\to c}\right)$$

Plugging in the result of Proposition 2 and rearranging, we can see that, for some $\kappa_{d,pt} \in \mathbb{R}$ and $s_d^O > 0$, the following relation must hold:

$$s_d^O \ln\left(O_{d,t}^{p\to c}\right) = \lambda WPI_t^{c\to p}(\mathbf{W}_{pt}) + \kappa_{d,pt} \tag{14}$$

From this, we can see that β from Equation 3 should converge to $\frac{\lambda}{s_d^O}$. Because in this model we have $s_d^O > 0$ for every d (regardless of the relation between WPI and the equilibrium transfer), then $\beta > 0$ if and only if $\lambda > 0$. For this reason, we can interpret a test of whether $\beta > 0$ as estimated for every separate $\ln\left(O_{d,t}^{p\to c}\right)$ as a test of whether $\lambda > 0$, i.e., a test of the relation between the WPI and the equilibrium transfer.

B.2 Aid

As anticipated, we assume that $(A_{d,t}^{c\to p})_{d\in D}$ are costly actions that can be used by the coercer to increase the probability of receiving an offer from the policymaker.

Specifically, we add a first stage to the game analyzed in Section 3, so that the game is now the following:

- Every coercer $c \in C$ in period t simultaneously chooses how much aid of each type to send to policymaker c, i.e. it chooses $(A_{d,t}^{c\to p})_{d\in D}$.
- With probability p the policymaker and every $c \in C$ play the game of Section 3.
- With probability $1-p$ the policymaker fails and every $c \in C$ obtains 0.

We assume that the probability p is a function of $\sum_{c\in C}\sum_{d\in D}\zeta_d A_{d,t}^{c\to p}$, i.e. the sum of all types of aid that the policymaker receives from any of the coercers, choice $(A_{d,t}^{c\to p})_{d\in D}$ of each $c \in C$. Specifically, we assume that, for parameters $\zeta_d > 0$, it is given by the following form:

$$p\left(\sum_{c\in C}\sum_{d\in D}\zeta_d A_{d,t}^{c\to p}\right) = \frac{e^{\sum_{c\in C}\sum_{d\in D}\zeta_d A_{d,t}^{c\to p}}}{1+e^{\sum_{c\in C}\sum_{d\in D}\zeta_d A_{d,t}^{c\to p}}}$$

Note that this expression is consistent with a logistic model, it is thus a standard way to model how a vector of variables affects the probability of an event. This expression simplifies the analysis as it is concave in each $A_{d,t}^{c\to p}$ and the derivative with respect to every $A_{d,t}^{c\to p}$ only depends on the total probability $p\left(\sum_{c\in C}\sum_{d\in D}\zeta_d A_{d,t}^{c\to p}\right)$.

Recall from the analysis in Section 4.3.2 that c obtains payoff $\hat{B}_t^{p\to c}$ with probability $1-F(0) = e^{-\lambda 0} = 1$, as in equilibrium every coercer supports the policymaker. Given c's expectation on the amount of aid that the other major powers send, $\mathbf{A}_{-f}$, and given cost

parameters $\tilde{C}_d > 0$ and $\tilde{\gamma}_d > 1$, the structure of the game implies that the vector $(A_{d,t}^{c\to p})_{d\in D}$ is determined from the following maximization problem:

$$\max_{(A_{d,t}^{c\to p})_{d\in D}} \quad p\left(\sum_{c\in C}\sum_{d\in D}\zeta_d A_{d,t}^{c\to p}\right)\hat{B}_t^{p\to c} - \sum_{d\in D}\tilde{C}_d(A_{d,t}^{c\to p})^{\tilde{\gamma}_d} \tag{15}$$

The restrictions on the parameters imply that the objective function is concave, thus we can focus on first order conditions. Letting $\hat{p}_{pt}$ be the expected probability of survival given the optimal $\mathbf{A}_{-f}$ and $(A_{d,t}^{c\to p})_{d\in D}$, we find that each $A_{d,t}^{c\to p}$ must satisfy the following first order condition for each c:

$$\zeta_d\hat{p}_{pt}(1-\hat{p}_{pt})\hat{B}_t^{p\to c} = \tilde{\gamma}_d\tilde{C}_d(A_{d,t}^{c\to p})^{\tilde{\gamma}_d-1}$$

Note that also $\hat{p}_{pt}$ depends on $A_{d,t}^{c\to p}$. But from the above we see that for any pair of $\hat{p}_{pt}$ and $A_{d,t}^{c\to p}$ that arises in equilibrium, we will be able to find parameters $s_d^A > 0$ and $K_{d,pt}^O, K_{d,1}^O \in \mathbb{R}$ so that:

$$K_{d,pt}^A + \ln\left(\hat{B}_t^{p\to c}\right) = K_{d,1}^A + s_d^A \ln\left(A_{d,t}^{c\to p}\right)$$

Plugging in the result of Proposition 2 and rearranging, we can see that, for some $\kappa_{d,pt}^A \in \mathbb{R}$ and $s_d^A > 0$, the following relation must hold:

$$s_d^A \ln\left(A_{d,t}^{c\to p}\right) = \lambda WPI_t^{c\to p}(\mathbf{W}_{pt}) + \kappa_{d,pt}^A \tag{16}$$

From this, we conclude that β from Equation 3 should converge to $\frac{\lambda}{s_d^A}$. Because in this model we have $s_d^A > 0$ for every d (regardless of the relation between WPI and the equilibrium transfer), then $\beta > 0$ if and only if $\lambda > 0$. For this reason, when we test whether $\hat{\beta} > 0$, where $\hat{\beta}$ is estimated from every separate $\ln\left(A_{d,t}^{c\to p}\right)$, we can interpret that test as a test of whether $\lambda > 0$, i.e., a test of the relation between the WPI and the equilibrium transfer.

B.3 Interpreting differences in the coefficients

As discussed above, the estimation of β from Equation 3 can be thought of as a test for whether our model is relevant to capture the effect of power. However, from Equations 16 and 14 we see that our estimate of β from Equation 3 will identify λ up to a type-dependent scaling factor $s_d^O > 0$ for each type of offer and $s_d^A > 0$ for each type of aid. This Section proposes a re-scaling of our observables so that, *if our model is correct*, we can interpret differences in the β's that we estimate from the different types of outcomes that we consider.

Let $Y_{d,cpt}$ be a component of the vector $(A_{d,t}^{c\to p})_{d\in D}$ or of $(O_{d,t}^{p\to c})_{d\in D}$. Adding a type-dependent noise term in Equations 14 and 16 for each coercer, policymaker and period, we find the following relation for some $s_d^Y > 0$:

$$s_d^Y \ln(Y_{d,cpt}) = \lambda WPI_t^{c\to p}(\mathbf{W}_{pt}) + \kappa_{d,pt}^A + \varepsilon_{d,cpt}^Y$$

This error can capture the idea that the optimality conditions that we used to derive Equations 14 and 16 do not hold exactly, but only with some noise. According to this discussion, we should expect the type-dependent errors to have different variances for each type of outcome considered. For instance, we could expect the optimality conditions to hold more precisely (thus a smaller variance) for those outcomes that are more *sensitive*, i.e., for those variables for which deviations from the optimum are more costly. Based on this, suppose that each noise term is an iid draw from a normal distribution with type-dependent variance $\varepsilon_{d,cpt}^Y \sim \mathcal{N}(0, \sigma_d^Y)$, where we interpret a larger σ_d^Y as corresponding to a more sensitive type of outcome.

Now note that we do not observe $s_d^Y \ln(Y_{d,cpt})$ but only $\ln(Y_{d,cpt})$. Then, from the above condition we can derive the following

$$\ln(Y_{d,cpt}) = \frac{\lambda}{s_d^Y} WPI_t^{c\to p}(\mathbf{W}_{pt}) + \frac{\kappa_{d,pt}^A}{s_d^Y} + \frac{\varepsilon_{d,cpt}^Y}{s_d^Y}$$

Whence we conclude that the observed standard deviation of $\ln(Y_{d,cpt})$, which we denote by $\sigma_{d,Y}$, should be equal to $\frac{\sigma_d}{s_d^Y}$, i.e., the ratio between the standard deviation of the type-dependent error and the parameter s_d^Y. Scaling the observed $\ln(Y_{d,cpt})$ by its observed standard deviation, we thus find the following condition for an iid standardized noise term $\varepsilon_{cpt} \sim \mathcal{N}(0,1)$:

$$\sigma_{d,Y}^{-1} \ln(Y_{d,cpt}) = \frac{\lambda}{\sigma_d^Y} WPI_t^{c\to p}(\mathbf{W}_{pt}) + \frac{\kappa_{d,pt}^A}{\sigma_d^Y} + \varepsilon_{cpt} \tag{17}$$

Equation 17 is the reason why in our baseline specification we study outcomes the standardized natural logarithms of each variable (as discussed in Appendix C). This discussion suggests that when we estimate β from Equation 3 with such standardized outcomes, then we can interpret larger coefficients as a measure of the sensitiveness of a particular type of outcome.

C Data appendix: description and construction

This Section provides details on how we constructed our variables of interest. Appendix D.4 shows that our analysis is robust to alternative transformations.

C.1 Trade flows

Trade flows are constructed from the CEPII Gravity dataset. The dataset reports trade flows from multiple sources (IMF, UN, BACI). These sources do not always agree with each other and sometimes one source features missing values when another one does not. Additionally, IMF and UN data distinguishes between the trade value as reported by the origin vs. the destination country. For our baseline analysis we integrated the various sources to obtain the largest dataset possible. Importantly, all these trade flows are highly correlated and results are robust to alternative choices.

When building our measure of power over a given policymaker from trade flows, we prioritized information on the value of trade flows as reported by the policymaker. Specifically, we started from IMF data on policymaker-reported trade flows. If missing, we added the UN Comtrade policymaker-reported value of the trade flow. If missing, we added the coercer-reported IMF figure. If missing, we added the coercer-reported observation from the UN dataset. And finally we integrated missing observations using the BACI dataset.

We used a similar procedure when building flows of imports and exports to use as our outcomes. As in this case our focus is on the effect on the coercer, we followed the precedure outline above but prioritizing coercer-reported figures.

C.2 GDELT data

As mentioned, the GDELT dataset contains information on different types of international interactions (each defined as a distinct CAMEO category) between 1978 to 2012 at the country pair level and with a daily frequency. To derive a dataset with a yearly frequency, we sum up all the interactions of the same type taking place between any two countries in distinct days but in the same year. In addition to such aggregation, every variable from GDELT is transformed in two ways: a normalization to compare the estimated coefficients and a substitution to avoid drooping the zeros. The following provides details and discusses the logic of each of these exercises.

Aggregation. Let $\mathbf{y}_{d,fh,\tau(t)}$ be the vector where $y_{d,fh,\tau(t)} = 1$ when we observe an interaction of type d (e.g., one of those described in Table 1) between any country c and any country p in any day τ of any year t, and $y_{d,fh,\tau(t)} = 0$ when we do not. We construct our

yearly variables with the following procedure. We aggregate over the given year t for every country c, country p and event of type d, i.e. we compute $\tilde{Y}_{cpt} = \sum_{\tau:\tau^{-1}(\tilde{t})=t} y_{d,fh,\tau(t)}$. In an unreported robustness check, we show that our results are robust to alternative aggregation rules. For instance, we show that we can replicate our results when constructing outcomes by summing up, for each coercer-policymaker pair, the interactions of the same kind happening in the same year but in distinct half-weeks, weeks, half-months, months or trimesters.

Substitution. The second transformation replaces every observed 0 with 0.5, a transformation that avoids dropping the zeros when taking the log, while still preserving the shape of the log. The interpretation for this transformation is that any observed zeros does not really correspond to a situation with no interactions, but rather to a situation with very few of them. Importantly, our analysis also holds when we simply take the log (thus dropping all zeros) or when we employ the more standard transformation of adding 1 to each variable before taking the log. Finally, note that in our baseline specification we control for $ln(Trade_{cpt})$, we are thus dropping all observations with a small treatment (i.e. any coercer-policymaker pair where the coercer has zero economic power over the policymaker). Define $\underline{Y}_{cpt}$ so that $\underline{Y}_{cpt} = \tilde{Y}_{cpt}$ if $\tilde{Y}_{cpt} > 0$, and set $\underline{Y}_{cpt} = 0.5$ if $\tilde{Y}_{cpt} = 0$.

Normalization. The final transformation is a normalization such that the standard deviation of the log of each variable is fixed to 1 (see Appendix B for a reason to do so). Define the standard deviation of each $\ln(\underline{Y}_{cpt})$ as $\sigma_{Y,d}$. Our final variable is defined as $Y_{cpt} = \underline{Y}_{cpt}^{\sigma_{Y,d}^{-1}}$. This is the variable whose descriptive statistics are reported in Table 1 and that we analyze in Section 4.2.

D Robustness exercises

All Tables related to our robustness exercises can be found after Appendix E. To express our results compactly, we focused on reporting only the coefficients of interest and their standard errors. More details are available upon request.

D.1 Fixed effects

Our first robustness exercise shows that our results hold across different fixed effects specifications. We now discuss the interpretation and logic behind checking alternative fixed effect specifications, how we can interpret the differences between these exercises, and how these findings speak to our main results and, more in general, our theory. Recall that, in our baseline analysis, we included α_{pc}, α_{pt}, and α_{ct} as fixed effects. This means that we could not include the standard gravity controls such as (log of) GDP, GDP per capita, and (log

of) Population for both countries. While results can be shown not to depend on whether we do so, the coefficients reported in Table D.3 are estimated by including the largest possible vector of Gravity controls that is compatible with the fixed effect specification we consider.

Year fixed effects. Panel A of Table D.3 only includes α_{pc} (and gravity controls), without year fixed effects. The estimated coefficients could be simply driven by the upward trend of both the Weaker Powers Index and our measures of international cooperation. While both variables do feature an upward trend over time (and so do most of the Gravity controls), when we compare Panel A and Panel B of Table D.3 (where we include the year fixed effect) we see that the inclusion of a year fixed effect has almost no impact on the coefficients, suggesting that the upward trend was not important for the estimates in Panel A.[46]

Why Policymaker×Year fixed effects? By including α_t, Panel B of Table D.3 controls for any global process or time trend affecting countries homogeneously. However, relative to our baseline specification, it omits both α_{pt} and α_{ct}. The omission of α_{pt} implies that the results in Panel B might be driven by some time-varying feature of the policymakers that might affect how (and with whom) they trade and also their international interactions. For instance, if smaller and poorer countries were more likely to have fewer international interactions (as recorded in the media) and they also were more likely to be highly dependent on one particular country for their trade, then in Panel B we would find a positively biased estimate of the relation between the Weaker Powers Index and the overall extent of bilateral international interactions. On the other hand, if countries who have less international interactions (or are less likely to be reported in the news) were on average more likely to trade with more countries and not to depend too much on any of them, then this would induce a negative bias in the estimate reported in Panel B for how the Weaker Powers Index affects our various bilateral outcomes. Importantly, once we include α_{pt}, then any such effect would be muted.

Effect of including Policymaker×Year fixed effects. Comparing Panel B with Panel D of Table D.3, where we include α_{pt}, we find that the results do not change by much, suggesting that neither of the alternative explanations discussed above induces an important bias on the WPI. If any effect can be discerned, we see that adding α_{pt} increases the estimated coefficient, suggesting that the second hypothesis is more important for the average coercer-policymaker pair that we observe. Note that the coefficients reported control for the policymaker's GDP (log), GDP per capita and Population (log), so the effect of size or wealth should be captured by these variables (if the functional form is correct). But we verified that our conclusion about the comparison between Panel B and D does not change

[46] Column (1) in Tables D.1 and D.2 show that the WPI is important for Imports and Exports also when we only consider coercer-policymaker pair fixed effects α_{pc} without year fixed effects α_t.

when we omit these controls.

Why Coercer×Year fixed effects? Compared to our baseline specification, another limitation of Panels A, B and D of Table D.3 is that they omit α_{ct}. This can be important as we wish to be robust relative to the possibility that our results are driven by differences in coercers in particular periods. For instance, consider two large countries as coercers who only interact and trade with their separate geopolitical regions. One is positioned in a thriving region where there are no other big countries, and the average country trades a lot with a lot of other small ones (but mainly with the large one). The other coercer is also the only large country in its geopolitical region, but such region is poor or more ill-connected and the average country only trades with the big one. The first coercer would have a larger average WPI than the other one WPI. Unfortunately, it is also easy to see how such scenarios would reflect in differences in outcomes. For instance, we might expect that in more dynamic geopolitical regions there is more potential for misunderstandings, which can translate into a larger international role as mediator (or rule-setter) for the large country than the role it would have in the poorer region. Alternatively, we can expect large countries in poorer regions to cannibalize all international interactions, possibly because they are the only country that matters in that specific geopolitical environment. All these are examples of conditions that might affect both our outcomes and the WPI, potentially biasing our coefficients. Moreover, local conditions like the ones we described are likely to change over time, thus casting doubts on the possibility to capture these effects by simply including α_{pc}. On the other hand, our baseline analysis takes care of these issues by including α_{ct}, thus focusing on the deviations in a coercer's outcomes relative to its *yearly* average outcome.

Effect of including Coercer×Year fixed effects. Comparing Panel C of Table D.3 and the panels that do not include α_{ct} (Panels A, B and D of Table D.3), we see that the inclusion of α_{ct} reduces our estimated coefficients. While this can be interpreted as a by-product of one of the stories that we highlighted above, another possibility, which is in line with our theory, is that the reduced coefficient comes from the fact that these fixed effects absorb also unilateral measures of c's power, e.g. the size of its military. As we can expect countries with a stronger military to be able to more effectively use their economic leverage, then the inclusion of α_{ct} implies that we are likely to be left with a type of variation that understates the effect of economic power on international interactions. Even if this is somewhat undesirable, we still prefer to include α_{ct} in our baseline specification to be as robust as possible to alternative explanations. With the fixed effects introduced in our baseline, even a time-dependent, non-linear and non-monotone effect of size, wealth or any other unilateral characteristics would be captured by α_{ct} and α_{pt}, and cannot thus affect the estimates of our baseline specifications.

Regional-pairs×Year fixed effects. Finally, Panel E of Table D.3 shows that our results are robust to an even more demanding specification than our baseline one. On top of α_{pc}, α_{pt}, and α_{ct}, we add time-varying fixed effects for each pair of geopolitical regions. Letting $S(j)$ is the geopolitical region of country j, these fixed effects capture *time-varying* characteristic that can be linked to the particular geopolitical region of a coercer and of a policymaker $\alpha_{S(c)S(p)t}$.[47] A potential reason to include $\alpha_{S(c)S(p)t}$ is that we wish to be robust to possible events that affect the international interactions between any two geopolitical regions in a time-varying way and that can in principle affect trade flows (thus our measures of power). For instance, the formation of the European Union and the process of integration that followed such event is likely to have had a common effect (certainly time varying, at least within our sample period) on all countries involved, both in their pattern of cooperation with other regions of the world *and* their pattern of trade with them. Another example is the collapse of the Soviet Union. Clearly, this event affected Eastern Europe and the ex members of the Soviet Union. It affected both their relations with the other regions of the world and their pattern of trade. Note that both the effects of the collapse of the Soviet Union and the formation of the European Union on any single coercer or policymaker would be captured by α_{ct} and/or α_{pt}, *unless* such effects have a systematic time-dependent variation that is linked to the country pair considered. The inclusion of $\alpha_{S(c)S(p)t}$ accounts for this, when such systematic variation is not specific to each specific country pair but rather to the pair of geopolitical region in which such countries reside. In Panel E of Table D.3 we find that the addition of this type of fixed effect to our baseline specification (reported in Table 3) has only a mild impact on the magnitude of the estimated coefficients, and does not affect their statistical significance. Thus, our results are unlikely to be driven by one of the many large supranational geopolitical shocks that happened in the sample period under consideration.

Finally, while we do not report the related tables, we have verified that the results in Tables 5, 6, and 7 are robust to an appropriate set of alternative fixed effect specifications.

[47] We did this robustness check with both definitions of geopolitical regions included in the CEPII dataset. In Panel E we report the coefficients obtained from a division of the world in 10 areas: Eastern Europe and post Soviet Union, The Caribbean, Latin America, North Africa and the Middle East, Sub-Saharan Africa, Western Europe and North America, East Asia, South-East Asia, South Asia, The Pacific. In another exercise (unreported) we focus on a division of the world in 6 regions: Africa, North America, Latin America, Asia, Europe, Middle East.

D.2 Alternative prediction: Weaker Powers Index vs. Stronger Powers Index

In Section 3.1 we assumed that the probability of political survival of the policymaker was simply a decreasing function of the power share of all countries that opposed the policymaker. A more general specification would be to allow for such probability to be increasing in the power of all supporting coercers and decreasing in the power of all coercers that oppose the regime. Applying the same argument of the proof of Theorem 1 to this more general model would yield a more general prediction: every coercer's equilibrium transfer is increasing in the power of all weaker coercers and decreasing in the power of every stronger one.

There are two reasons why, in the main text, we ignored this more general prediction. First, we wanted to express our results in terms of power shares, as this enables us to compare our prediction with the natural prediction that relatively more powerful countries (countries with a larger power share) obtain better outcomes. Second, for robustness concerns, we wanted to include α_{pt}, a policymaker-year fixed effects. Clearly, once we include such fixed effects and we express our results in terms of power shares, then we cannot estimate the effect of the power share of stronger coercers *and* the effect of the power share of weaker ones, as the two become perfectly collinear. However, as in Section D.1 we showed that excluding α_{pt} from our specification does not alter the results too much, we are now in a position to discuss the merits of this generalized prediction.

In Table D.4 we replicate the analysis of Panel A, B, and D of Table D.3, but this time we add the Stronger Powers Index, i.e., the share of total power of all stronger coercers. Note that this variable is not collinear with the Weaker Powers Index: in the absence of α_{pt}, we are left with some variation that is due to the share of total power over the policymaker that is controlled by the policymaker, i.e., the policymaker's domestic power (its ability to resist external pressure). The reason why we still express these findings in terms of shares is that we wish to make our results comparable with our baseline findings.

Table D.4 shows that once we control for the Weaker Powers Index, the Stronger Powers Index is negative, albeit only marginally significant. The fact that the Weaker Powers Index remains positive and significant and that the Stronger Powers Index is instead close to zero justifies our focus on the simpler specification of the model, where the probability of survival is a one-dimensional function. If we wanted to take the negative coefficients of the Stronger Powers Index at face value, then this would suggest that any generalization of the model would require to add an extra stabilizing impact of the power of supporting countries than what can be captured by the Weaker Powers Index.

D.3 Estimating equations

The objective of this Section is to show that results are robust to a variety of deviations from the estimating equations that we focused on in Sections 4.3, 4.4, and 4.5.

The estimating equations of Sections 4.3 and 4.4 are based on the finding that we should expect a positive log-linear relation between our outcomes measuring international interactions and the Weaker Powers Index (see Section B). We thus focused on a log-linear relation, adding a restrictive set of fixed effects (see Section D.1 for a discussion and for alternative fixed effect specifications). On top of that, we introduced two controls. One is a coercer's Relative Economic Power (REP) over the policymaker, which enables us to distinguish our theory against the natural alternative hypothesis that stronger countries obtain better relations. The other is the trade flow between the policymaker and the coercer, as it is natural to expect that countries who trade more should have friendlier relations (and also larger WPI).

To be as conservative as possible, in our baseline specification we controlled for the *contemporaneous* trade flow and we used the *lagged* distribution of power to compute the WPI and the REP. In Table D.5 we present the coefficients under different specifications. We show that the Weaker Powers Index remains an important determinant of international cooperation regardless of whether we include trade flows, whether we include the *contemporaneous* trade flows *and* the *contemporaneous* REP, and whether we focus on the *contemporaneous* WPI, rather than the lagged one. A comparison between our baseline estimates (the even Columns of Table 2) and Panel A of Table D.5 (where we do not include the contemporaneous trade flow) reveals that the estimated coefficients of the WPI are not affected by such change of specification. Panel B and C of Table D.5 show that when we substitute the lagged REP with the contemporaneous one, our coefficient for the lagged WPI is slightly reduced, but remains significant (regardless of whether we introduce trade flows as in Panel B or we do not as in Panel C). In Panel D of Table D.5 we show that focusing on the contemporaneous rather than lagged WPI does not alter our results. Finally, Panel E of Table D.5 shows that results are robust to the inclusion of the lag of the outcome. This exercise makes sure that the estimated effects do not change too much when we allow for a dynamic specification of the empirical model. We find that this addition reduces the magnitude of the estimated impact of the WPI, but it remains significant at the 1% level with respect to all our outcomes. In an unreported robustness check we also verified that the effects are still significant when we allow the lag of the outcome variable to have a time-varying, a policymaker-specific or a coercer-specific coefficient. Also, while we do not report the Tables for it, the same robustness exercises can be shown to hold for our event studies (Tables 5

and 6).

For the case of Imports and Exports (Section 4.5), we considered estimating Equations based on the large literature employing Gravity models to estimate bilateral trade flows. We simply added the lagged WPI and the lagged REP to the standard estimating equations. Tables D.1 and D.2 show that deviations from our estimating equations do not change the results.

D.4 Outcome definitions

Section C presented and justified the transformations that we performed before analyzing our outcome variables. The first of these transformations, the normalization, is simply a rescaling of the coefficient, so it does not play any role in the statistical significance of the parameters of interest. As a second transformation, we substituted any observed 0 with 0.5 to avoid dropping the zeros when taking the log. As justified, we are interested in this transformation as we wish to preserve the shape of the log as much as possible, as this is part of the prediction of our model. Table D.6 shows that the result are robust to alternative transformations. Indeed, our results are found to hold even when we simply take the log (dropping all the zeros) or when we adopt the more standard approach of analyzing $\ln(1+Y)$, i.e. of adding 1 to each variable before taking the log. The same robustness exercises can be shown to hold for Tables 5 and 6.

D.5 Model-based standard errors

Table D.7 and D.8 show that the way we calculate standard errors does not matter for the statistical significance of our coefficients of interest. Note that in our baseline specification we use two-way clustered standard error, where we consider as clusters each coercer and each policymaker. While this allows for a general form of dependence, it does not allow for cross correlation across countries. This restriction might be at odds with the very alternative hypothesis that we are trying to test (the importance of the WPI), as the key prediction of our model is that the bilateral outcomes of each coercer-policymaker pair should depend on the characteristics of other coercers.

As a first approach, we calculate three-way clustered standard errors (labeled "3w-Clusters c, p, t" in Table D.7), where we also cluster with respect to time (each year). Adding time as a clustering dimension yields standard errors that are robust to a general form of contemporaneous cross-country dependence. As we can see, the standard errors increase by as much as 30%, but all coefficients remain significant with a p-value below 1%. A limitation of this approach is that it does not allow for the cross-country dependence to have

an auto-correlated component. To calculate standard errors that are robust to this type of error structure, we calculate the standard errors proposed in Driscoll and Kraay (1998). We calculate Driscoll-Kraay standard errors allowing for various degrees of persistance in the autocorrelation component: either four lags (labeled "D-K 4 lags" in the Table) or seven lags (labeled "D-K 7 lags" in the Table). Tables D.7 and D.8 show that these standard errors can be twice as large as the ones we computed in the baseline analysis. However, coefficients remain statistically significant at the 1% level (except for Humanitarian Aid, whose significance is now between the 1% and the 5% level).

D.6 Conditioning on the other outcomes

While we interpret the analysis of different outcomes as a form of cross-validation of the theory, it is still true that these outcomes are likely to be related to each other independently of their link to the Weaker Powers Index. In this Section we show that the WPI has a direct effect on each of our outcomes, even when we condition on various combination of the other outcomes, or other related variables (Table D.9). Column (6) of Tables D.1 and D.2 does the same exercise but for imports and exports.

Panel A of Table D.9 controls for *all types* of offers sent by the coercer to the policymaker. This exercise allows for the possibility that countries are more likely to express their intentions to cooperate (which would be categorized as an offer) as a response to the other country expressing such intentions. While we do find a positive effect of the number of offers sent on the number of offers received (and on aid sent), Panel A shows that the WPI remains a significant determinant of the offers received and of aid sent, suggesting that the WPI has a direct effect on explaining the number of offers received (or aid sent) conditional on the numbers of offers sent.

Panel B of Table D.9 controls for all types of offers sent by the coercer *and* all types of aid sent. This exercise allows for the possibility that a policymaker is more likely to make an offer to a coercer (i.e., be reported as declaring some intention to improve cooperation with the coercer) when such coercer sends aid to the policymaker. While it can be shown that such mechanism is relevant, Panel B shows that the WPI remains a significant determinant of the number of offers sent, conditional on the number of offers received and on aid sent.

Finally, Panel C of Table D.9 controls for all types of offers sent and all types of offers received. This allows for the possibility that a country who receives more promises of future cooperation (and who sends more) is more likely to send aid. Again, we show that this mechanism is an important determinant of aid sent, but we also find that the WPI still has a significant and positive effect on aid sent, conditional on the offers sent or received.

We interpret these exercises as revealing that the Weaker Powers Index captures some variation that is intrinsic to each of these variables, and not only a subset of them. From this perspective, Table D.9 lends credence to the idea that our focus on different outcomes is a form of cross-validation.

E Validation exercises

This Section shows that the analysis can be replicated with an alternative measure of power, with alternative outcomes, and restricting the attention to some subsamples of interest. To express our results compactly, we focused on reporting only the coefficients of interest and their standard errors. More details are available upon request.

E.1 Replication with alternative measure of power: the Formal Bilateral Influence Capacity (FBIC)

In this section we show that we can replicate all of our analysis with an alternative measure of power, the Formal Bilateral Influence Capability (FBIC).[48] This variable is a composite measure of bilateral power that measures economic power but also other dimensions of power, as it uses information on arms transfers, aid dependence, formal role in international institutions, and other measures (Moyer et al., 2018).

Tables E.1 and E.2 present statistics on the relation between the FBIC (denoted $I_t^{c\to p}$) and economic power, the measure we analyzed in our baseline specification (denoted $E_t^{c\to p}$). As we should expect, Table E.1 shows that there is a strong positive correlation between the two measures of power under consideration (0.6 between the actual variables, and 0.73 for the WPI computed from the two variables). However, Table E.2 shows that this correlation is drastically reduced when we look at the variation that remains after we net out all the fixed effects that we include in our baseline specification. Specifically, when we look at deviations from α_{pc}, α_{pt}, and α_{ct}, the two variables only exhibit a 0.21 correlation and the two WPI that can be computed from these variables have a correlation of 0.36. These statistics suggest that the two variables are effectively different, making the replication of the analysis all the more important.

Tables E.3 and E.4 replicate the results of Tables 3 and 7 substituting our measure of power with this alternative one. Note that the estimated coefficients are around half of those that we estimated in our baseline analysis (one third for the case of imports and exports). However, the standard deviation of the FBIC (and the WPI related to the FBIC) is around

[48] This measure can be accessed from https://korbel.du.edu/fbic.

three times that of economic power (see Tables E.1 and E.2). As a consequence, we can show that the impact of increasing the FBIC-based WPI by one standard deviation is greater than the comparable counterfactual we proposed in our baseline analysis.

E.2 Replication with alternative outcomes: Agreements

As a further validation check, we show that we can replicate all of our analysis focusing on another set of outcomes from the GDELT datasets: *agreements*, measuring for each country pair and in each year the initiation, resumption, improvement or expansion of cooperation in a particular domain (economic, military, diplomatic, and judiciary). In addition, we also focus on what we call *political agreements* which captures the ratification, signature and finalization of an agreement or treaty, regardless of its nature. A more precise description of these variables and summary statistics are reported in Table E.5.[49]

Similar to the offers studied in our baseline specification, agreements measure the extent of cooperation in each coercer-policymaker pair. However, unlike offers, these variables capture the actual conclusion of deals and agreements between the two parties. In other words, agreements are the realization of the offers. An important drawback of focusing on agreements is that they are undirected: the agreements that country A concludes with country B are the same that country B concludes with A. To avoid including the same outcome twice, we thus restrict attention to *asymmetric country pairs*: the subsample of coercer-policymaker pairs where the coercer has more power over the policymaker than viceversa.[50]

Tables E.6, E.7, and E.8 replicate our baseline analysis, the event study, and the event study restricted to the United States. All of our results are shown to hold, providing a further demonstration of the importance of the WPI (thus our model) to understanding the pattern of international cooperation.

E.3 Replication in different subsamples: Major Powers as coercers and Asymmetric Relations

Our final validation exercise replicates our analyses in different subsamples of interest. In line with our interpretation of the model as describing how major powers affect domestic decision-making, we focus on subsamples where only major powers can be coercers, and they

[49] We perform the same transformations that we did for all the other variables from GDELT (see Appendix C for details).

[50] Results are robust to focusing on the full sample. Moreover, in Section E.3 we show that all of our results can be replicated when focusing on asymmetric country pairs.

are excluded from the set of policymakers.[51] We define as *major powers* those countries that have been at the top of the distribution of GDP in at least a year in our sample. Table E.9 lists all coercers that we define as major powers for different definitions that we adopt (top 5, 10, 20, or 30). Table E.10 successfully replicates our results in these subsamples, confirming that our theory is a useful description of the relation between major powers and non-major powers (Panels A, B, C, and D of Table E.10). Finally, Panel E of Table E.10 replicates the analysis for *asymmetric country pairs*, the subsample of coercer-policymaker pairs where the coercer has more power over the policymaker than viceversa. Again, this analysis suggests that our results are important to understand asymmetric relations, where power (thus our theory) is likely to be more important.

While we do not report the relevant table, we also manage to replicate our results on imports and exports (Table 7) for the case of asymmetric country pairs. On the other hand, when focusing on the relations between major powers and non-major powers, we only start finding statistically significant effects when defining major powers as countries that have ever been in the top 40 of GDP. The problem with limiting our attention to a smaller set of coercers when analyzing exports and imports is likely due to our empirical strategy, which adopts unilateral measures of power (in our first stage estimates). As a consequence of this, we do not have enough variation when we restrict attention to a few coercers, as we cannot exploit variations *within* coercers in the same year. In line with this, we find that standard errors are very high when we focus on subsamples with few coercers.

[51] In principle, the model can also reflect other interactions that justify our focus on a global dataset. For instance, the model is compatible with a policymaker being a major power who wants to implement an infrastructural project (e.g., a pipeline) whose completion requires the consent or participation of multiple local rulers.

Figures and Tables of the Appendices

Table D.1: robustness of results in Table 7 to alternative specifications

	c's Imports from p (ln)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{WPI}^{c\to p}$ (lag)	6.38**	12.99**	3.92	4.80*	12.45***	5.08**
	[2.82]	[5.35]	[2.53]	[2.50]	[3.62]	[2.55]
$\widehat{REP}^{c\to p}$ (lag)	-3.42	-24.29	-7.99	-10.09	-1.87	-3.01
	[11.36]	[23.03]	[10.04]	[10.17]	[17.81]	[9.77]
Year FE	No	Yes	Yes	Yes	Yes	Yes
Outcome lag	Yes	No	Yes	Yes	Yes	Yes
c and p's GDP p.c.	Yes	Yes	No	No	No	Yes
c and p's Pop (ln)	Yes	Yes	Yes	No	No	Yes
c and p's GDP (ln)	Yes	Yes	Yes	Yes	No	Yes
Exports (ln)	No	No	No	No	No	Yes
Observations	813,093	813,099	813,093	818,462	823,485	784,286
Adj. R-2	0.53	0.06	0.32	0.32	0.29	0.53
K-Paap F	41.777	46.085	30.306	26.226	41.673	46.260

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The table reports 2SLS estimates, where the second stage uses (lagged) trade flows to measure power and the first stages uses the distribution of GDP to measure power (see Equations 7, 6). $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. All specifications control for coercer-policymaker fixed effects. Standard errors (in parenthesis) are two-way clustered (one cluster for each c and one for each p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.2: robustness of results in Table 7 to alternative specifications

	c's Exports from p (ln)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{WPI}^{c\to p}$ (lag)	5.83***	13.14***	2.42	1.51	9.32***	5.01***
	[2.00]	[3.56]	[1.76]	[1.66]	[2.71]	[1.79]
$\widehat{REP}^{c\to p}$ (lag)	-0.51	-19.64	-2.20	0.16	9.67	0.04
	[6.52]	[12.46]	[6.28]	[6.03]	[12.71]	[5.26]
Year FE	No	Yes	Yes	Yes	Yes	Yes
Outcome lag	Yes	No	Yes	Yes	Yes	Yes
c and p's GDP p.c.	Yes	Yes	No	No	No	Yes
c and p's Pop (ln)	Yes	Yes	Yes	No	No	Yes
c and p's GDP (ln)	Yes	Yes	Yes	Yes	No	Yes
Imports (ln)	No	No	No	No	No	Yes
Observations	813,091	813,098	813,091	818,460	823,483	784,284
Adj. R-2	0.57	0.08	0.35	0.35	0.32	0.58
K-Paap F	46.989	48.862	30.841	25.382	39.573	46.257

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The table reports 2SLS estimates, where the second stage uses (lagged) trade flows to measure power and the first stages uses the distribution of GDP to measure power (see Equations 7, 6). $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. All specifications control for coercer-policymaker fixed effects. Standard errors (in parenthesis) are two-way clustered (one cluster for each c and one for each p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.3: robustness of results in Table 3 to alternative fixed effects (with Gravity controls)

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: α_{pc}, $\mathbf{X}_{ct}$, and $\mathbf{X}_{pt}$						
$WPI^{c\to p}$ (lag)	2.90***	1.45***	1.37***	2.46***	1.03***	1.70***
	[0.57]	[0.37]	[0.36]	[0.47]	[0.36]	[0.39]
$REP^{c\to p}$ (lag)	-2.45***	-1.53***	-0.60	-2.33***	-1.08	-1.64*
	[0.81]	[0.49]	[0.47]	[0.82]	[0.66]	[0.88]
Panel B: α_{pc}, α_t, $\mathbf{X}_{ct}$, and $\mathbf{X}_{pt}$						
$WPI^{c\to p}$ (lag)	2.80***	1.32***	1.24***	2.27***	0.88**	1.58***
	[0.58]	[0.36]	[0.36]	[0.49]	[0.36]	[0.40]
$REP^{c\to p}$ (lag)	-2.20***	-1.23***	-0.33	-1.87**	-0.79	-1.25
	[0.79]	[0.44]	[0.42]	[0.82]	[0.69]	[0.87]
Panel C: α_{pc}, α_{ct}, and $\mathbf{X}_{pt}$						
$WPI^{c\to p}$ (lag)	1.88***	0.89***	0.84***	1.27***	0.41	0.88***
	[0.39]	[0.27]	[0.26]	[0.30]	[0.31]	[0.29]
$REP^{c\to p}$ (lag)	-0.96	-0.00	0.08	-0.33	0.10	0.12
	[0.58]	[0.52]	[0.41]	[0.54]	[0.57]	[0.56]
Panel D: α_{pc} and α_{pt}, and $\mathbf{X}_{ct}$						
$WPI^{c\to p}$ (lag)	3.42***	1.73***	1.59***	2.98***	1.35***	2.15***
	[0.63]	[0.42]	[0.40]	[0.53]	[0.38]	[0.45]
$REP^{c\to p}$ (lag)	-3.13***	-1.76***	-0.80	-2.97***	-1.52**	-2.14**
	[0.77]	[0.53]	[0.51]	[0.83]	[0.69]	[0.93]
Panel E: α_{pc}, α_{pt}, α_{ct}, and $\alpha_{S(c)S(p)t}$, where $S(j)$ is j's geopolitical region						
$WPI^{c\to p}$ (lag)	1.29***	0.70***	0.56***	0.79***	0.48*	0.50**
	[0.23]	[0.20]	[0.20]	[0.18]	[0.25]	[0.22]
$REP^{c\to p}$ (lag)	-1.16***	-0.45	-0.04	-0.68	-0.54	-0.26
	[0.41]	[0.44]	[0.34]	[0.42]	[0.51]	[0.54]

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c\to p}$ *(lag)* is the WPI, i.e., the share of economic power over p controlled by coercers weaker than c in $t-1$; $REP^{c\to p}$ *(lag)* is the REP, i.e., the share of economic power over p controlled by c in $t-1$. Outcomes are the log of the number of times in t in which p sent Economic, Military, or Diplomatic Offers to c, or c sent Economic, Military, or Humanitarian aid to p. Panel A and B control for policymaker-coercer pair fixed effects and Gravity controls for both c and p (log of GDP, log of Population, and the GDP per capita). Panel B also includes year fixed effects. Panel C adds time-varying fixed effects for c (dropping c's controls). Panel D adds time-varying fixed effects for p (dropping p's controls). Panel E modifies our baseline specification adding time-varying fixed effects for each pair of geopolitical regions as discussed in Section D.1. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.4: robustness of results in Table 3 to alternative fixed effects (with Gravity controls) and the Stronger Powers Index (SPI)

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: α_{pc}, $\mathbf{X}_{ct}$, and $\mathbf{X}_{pt}$						
$WPI^{c\to p}$ (lag)	2.90***	1.46***	1.40***	2.48***	1.05***	1.70***
	[0.57]	[0.37]	[0.36]	[0.47]	[0.36]	[0.39]
$REP^{c\to p}$ (lag)	-2.43***	-1.52***	-0.56	-2.29***	-1.05	-1.64*
	[0.78]	[0.48]	[0.46]	[0.79]	[0.66]	[0.86]
$SPI^{c\to p}$ (lag)	0.02	0.01	0.07	0.05	0.05	-0.01
	[0.11]	[0.06]	[0.06]	[0.10]	[0.06]	[0.08]
Panel B: α_{pc}, α_t, $\mathbf{X}_{ct}$, and $\mathbf{X}_{pt}$						
$WPI^{c\to p}$ (lag)	2.76***	1.26***	1.21***	2.16***	0.82**	1.47***
	[0.59]	[0.35]	[0.35]	[0.48]	[0.36]	[0.39]
$REP^{c\to p}$ (lag)	-2.25***	-1.31***	-0.36	-1.99**	-0.86	-1.37
	[0.76]	[0.43]	[0.42]	[0.79]	[0.68]	[0.84]
$SPI^{c\to p}$ (lag)	-0.09	-0.14*	-0.05	-0.22*	-0.13	-0.22**
	[0.13]	[0.08]	[0.07]	[0.13]	[0.08]	[0.11]
Panel C: α_{pc} and α_{ct}, and $\mathbf{X}_{pt}$						
$WPI^{c\to p}$ (lag)	1.87***	0.84***	0.82***	1.21***	0.36	0.80***
	[0.42]	[0.28]	[0.27]	[0.33]	[0.32]	[0.31]
$REP^{c\to p}$ (lag)	-0.97*	-0.08	0.06	-0.42	0.03	0.02
	[0.56]	[0.52]	[0.41]	[0.53]	[0.56]	[0.54]
$SPI^{c\to p}$ (lag)	-0.03	-0.14*	-0.04	-0.15	-0.12	-0.19*
	[0.13]	[0.08]	[0.08]	[0.13]	[0.08]	[0.10]

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$; $SPI^{c\to p}$ *(lag)* is the Stronger Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers stronger than c in period $t-1$. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c, or in which country c sent Economic, Military, or Humanitarian aid to p. Panel A and B control for policymaker-coercer pair fixed effects and standard Gravity controls for both coercer and policymaker (log of GDP, log of Population, and the GDP per capita). Panel B also includes year fixed effects. Panel C adds time-varying fixed effects for each coercer (thus dropping the coercer's Gravity controls). Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.5: robustness of results in Table 3 to alternative specifications of the estimating equation

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Trade (ln) **not** included, lag REP, lag WPI						
$WPI^{c\to p}$ (lag)	2.20***	1.17***	1.07***	1.69***	0.83***	1.25***
	[0.31]	[0.26]	[0.25]	[0.25]	[0.26]	[0.26]
$REP^{c\to p}$ (lag)	-1.43***	-0.36	-0.21	-1.09*	-0.50	-0.50
	[0.54]	[0.50]	[0.44]	[0.55]	[0.54]	[0.62]
Panel B: Trade (ln) **not** included, **current** REP, lag WPI						
$WPI^{c\to p}$ (lag)	1.80***	1.04***	0.89***	1.34***	0.69***	1.03***
	[0.27]	[0.25]	[0.21]	[0.22]	[0.23]	[0.21]
$REP^{c\to p}$	-0.09	-0.22	0.24	0.13	-0.09	0.10
	[0.42]	[0.35]	[0.25]	[0.54]	[0.46]	[0.54]
Panel C: Trade (ln) included, **current** REP, lag WPI						
$WPI^{c\to p}$ (lag)	1.76***	1.03***	0.86***	1.33***	0.67***	1.04***
	[0.27]	[0.24]	[0.21]	[0.22]	[0.24]	[0.22]
$REP^{c\to p}$	-0.18	-0.23	0.18	0.12	-0.14	0.11
	[0.41]	[0.35]	[0.26]	[0.54]	[0.44]	[0.55]
Panel D: Trade (ln) included, **current** REP, **current** WPI						
$WPI^{c\to p}$	1.92***	0.99***	1.05***	1.49***	0.58**	1.03***
	[0.31]	[0.22]	[0.25]	[0.25]	[0.28]	[0.25]
$REP^{c\to p}$	-0.95**	-0.53	-0.36	-0.47	-0.20	-0.27
	[0.47]	[0.42]	[0.35]	[0.57]	[0.52]	[0.59]
Panel E: Trade (ln) included, lag REP, lag WPI, **add** outcome lag						
$WPI^{c\to p}$ (lag)	1.85***	1.09***	0.71***	1.30***	0.72***	1.08***
	[0.27]	[0.23]	[0.23]	[0.20]	[0.22]	[0.25]
$REP^{c\to p}$ (lag)	-1.30**	-0.21	0.59	-1.03**	-0.52	-0.54
	[0.51]	[0.50]	[0.39]	[0.44]	[0.49]	[0.59]

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. When *(lag)* is omitted, as in Panel B, C and D, we are considering the relevant year t variable. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c, or in which country c sent Economic, Military, or Humanitarian aid to p. All specifications control for policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Panels C, D and E control for the log of trade between p and c. Panel E also controls for the relevant outcome in year $t-1$. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.6: robustness of results in Table 3 to alternative transformations of the outcome variables

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: $ln(\tilde{Y})$ (std. dev. still normalized to 1)						
$WPI^{c\to p}$ (lag)	1.29***	1.08*	2.41**	1.08***	0.51	1.10**
	[0.29]	[0.63]	[0.99]	[0.25]	[0.38]	[0.53]
$REP^{c\to p}$ (lag)	-1.01	-0.93	2.08	-1.17	1.35	-0.85
	[0.84]	[2.18]	[3.73]	[0.76]	[1.10]	[1.18]
Trade flow (ln)	-0.00	0.05	0.08	-0.02***	-0.00	-0.00
	[0.01]	[0.06]	[0.07]	[0.01]	[0.01]	[0.02]
Panel B: $ln(1+\tilde{Y})$ (std. dev. still normalized to 1)						
$WPI^{c\to p}$ (lag)	2.13***	1.19***	0.98***	1.68***	0.81***	1.24***
	[0.31]	[0.25]	[0.24]	[0.25]	[0.26]	[0.27]
$REP^{c\to p}$ (lag)	-1.41***	-0.43	-0.12	-1.03*	-0.51	-0.47
	[0.53]	[0.49]	[0.42]	[0.56]	[0.54]	[0.62]
Trade flow (ln)	0.01	0.00	0.00	0.00	0.00	-0.00
	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c, or in which country c sent Economic, Military, or Humanitarian aid to p. Rather than adopting the transformations discussed in Appendix C, Panel A only takes the log of the variable and then normalizes the standard deviation of the log to 1; Panel B adds 1 to every variable before taking the log, and then normalizes the standard deviation of the log to 1. All specifications control for the log of trade between p and c, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.7: robustness of results in Table 3 to alternative standard errors

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
$WPI^{c\to p}$ (lag)	2.16***	1.18***	1.05***	1.69***	0.81***	1.25**
3w-Cl c,p,t	[0.482]	[0.303]	[0.300]	[0.413]	[0.285]	[0.386]
D-K 4 lags	[0.664]	[0.327]	[0.316]	[0.575]	[0.200]	[0.507]
D-K 7 lags	[0.715]	[0.358]	[0.322]	[0.607]	[0.201]	[0.543]
$REP^{c\to p}$ (lag)	-1.44*	-0.36	-0.17	-1.09	-0.51	-0.49
3w-Cl c,p,t	[0.636]	[0.503]	[0.442]	[0.654]	[0.568]	[0.647]
D-K 4 lags	[0.707]	[0.324]	[0.281]	[0.636]	[0.475]	[0.426]
D-K 7 lags	[0.716]	[0.326]	[0.207]	[0.641]	[0.398]	[0.382]
Trade flow (ln)	0.01	0.00	0.00	-0.00	0.00	-0.00
3w-Cl c,p,t	[0.006]	[0.005]	[0.004]	[0.005]	[0.004]	[0.005]
D-K 4 lags	[0.005]	[0.003]	[0.004]	[0.005]	[0.003]	[0.004]
D-K 7 lags	[0.006]	[0.003]	[0.004]	[0.005]	[0.003]	[0.005]
Observations	281,190	281,298	253,732	281,305	281,305	281,305
Adj. R-2	0.47	0.27	0.16	0.58	0.43	0.36
Within R-2	0.005	0.001	0.001	0.004	0.001	0.002

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c, or in which country c sent Economic, Military, or Humanitarian aid to p. All specifications control for the log of trade between p and c, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. *3w-Cl* c, p, t indicates three-way clustered standard errors (c, p, t). *D-K 4 lags* and *D-K 7 lags* indicate Driscoll-Kraay standard errors allowing for up to 4 lags or 7 lags of auto-correlation in the cross-observations correlation structure, respectively. Stars represent statistical significance of the single hypothesis test under the highest of the three standard errors reported in parenthesis: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.8: robustness of results in Table 7 to alternative standard errors

	c's Imports (ln) Econ (1)	c's Exports (ln) Mil (2)
$\widehat{WPI}^{c\to p}$ (lag)	5.06***	4.43***
D-K 4 lags	[1.118]	[0.701]
D-K 7 lags	[1.200]	[0.731]
$\widehat{REP}^{c\to p}$ (lag)	-11.45	-7.93
D-K 4 lags	[5.963]	[4.184]
D-K 7 lags	[7.180]	[5.041]
Observations	813,093	813,091
Adj. R-2	0.30	0.33
K-Paap F (*D-K 4 lags*)	15.548	16.043
K-Paap F (*D-K 7 lags*)	10.457	10.778

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The table reports 2SLS estimates, where the second stage uses (lagged) trade flows to measure power and the first stages uses the distribution of GDP to measure power (see Equations 7, 6). $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. All specifications control for coercer-policymaker fixed effects, year fixed effects, the lag of the outcome, the GDP (log), the population (log), and the GDP per capita of both c and p. *D-K 4 lags* and *D-K 7 lags* indicate Driscoll-Kraay standard errors allowing for up to 4 lags or 7 lags of auto-correlation in the cross-observations correlation structure, respectively. Stars represent statistical significance of the single hypothesis test under the highest of the three standard errors reported in parenthesis: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table D.9: robustness of results in Table 3 to controls based on the different types of outcomes

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: control for all types of Offers sent						
$WPI^{c\to p}$ (lag)	0.89***	0.37***	0.73***	0.98***	0.34*	0.46***
	[0.16]	[0.11]	[0.20]	[0.18]	[0.18]	[0.16]
$REP^{c\to p}$ (lag)	-0.62***	-0.46**	-0.22	-0.73*	-0.44	-0.14
	[0.22]	[0.23]	[0.39]	[0.43]	[0.39]	[0.35]
Panel B: control for all types of Offers sent and of Aid sent						
$WPI^{c\to p}$ (lag)	0.76***	0.30***	0.59***			
	[0.15]	[0.11]	[0.19]			
$REP^{c\to p}$ (lag)	-0.53**	-0.40*	-0.10			
	[0.21]	[0.23]	[0.39]			
Panel C: control for all types of Offers sent and of Offers received						
$WPI^{c\to p}$ (lag)				0.80***	0.27**	0.28*
				[0.15]	[0.12]	[0.15]
$REP^{c\to p}$ (lag)				-0.61	-0.43	-0.13
				[0.41]	[0.29]	[0.28]

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to c, or in which country c sent Economic, Military, or Humanitarian aid to p. All specifications control for the log of trade between p and c, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Panel A controls for all types of offers sent by c to p in t. Panel B controls for all types of offers sent by c to p in year t and all types of aid sent by country c to p in t. Panel C controls for all types of offers sent by c to p in t and all types of offers sent by p to c in t. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table E.1: correlations and descriptive statistics of our measures of power

	$E_t^{c\to p}$	$WPI_t^{c\to p}(\mathbf{E}_{pt})$	$I_t^{c\to p}$	$WPI_t^{c\to p}(\mathbf{I}_{pt})$
$E_t^{c\to p}$	1			
$WPI_t^{c\to p}(\mathbf{E}_{pt})$	0.71	1		
$I_t^{c\to p}$	0.59	0.68	1	
$WPI_t^{c\to p}(\mathbf{I}_{pt})$	0.44	0.73	0.86	1
Mean	0.004	0.027	0.007	0.057
Std. Dev.	0.02	0.06	0.03	0.20
Std. Dev. (top 5)	0.05	0.12	0.08	0.46
Std. Dev. (top 10)	0.04	0.11	0.09	0.43
Std. Dev. (top 20)	0.03	0.10	0.06	0.33
Std. Dev. (top 30)	0.03	0.09	0.05	0.27
Std. Dev. (Asym.)	0.03	0.08	0.04	0.21

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $E_t^{c\to p}$ is the economic power of c on p that we used in our baseline specification and discussed in Section 4.1. $I_t^{c\to p}$ is the Formal Bilateral Influence Capacity of c on p as discussed in Appendix E.1. Std. Dev. (top N) is the standard deviation calculated in the subsample where countries can only be either coercers or policymakers, and countries are considered coercers if and only if there is some year within our sample in which that country is in the top N of GDP. Std. Dev. (Asym.) is the standard deviation in the subsample where we drop country pairs where the policymaker has more power over the coercer than viceversa.

Table E.2: correlations and descriptive statistics of our measures of power after netting out baseline fixed effects

	$E_t^{c\to p}$	$WPI_t^{c\to p}(\mathbf{E}_{pt})$	$I_t^{c\to p}$	$WPI_t^{c\to p}(\mathbf{I}_{pt})$
$E_t^{c\to p}$	1			
$WPI_t^{c\to p}(\mathbf{E}_{pt})$	0.57	1		
$I_t^{c\to p}$	0.21	0.28	1	
$WPI_t^{c\to p}(\mathbf{I}_{pt})$	0.14	0.36	0.74	1
Mean	0	0	0	0
Std. Dev.	0.01	0.03	0.01	0.07
Std. Dev. (top 5)	0.02	0.05	0.04	0.21
Std. Dev. (top 10)	0.02	0.05	0.03	0.17
Std. Dev. (top 20)	0.02	0.04	0.02	0.14
Std. Dev. (top 30)	0.02	0.04	0.02	0.12
Std. Dev. (Asym.)	0.01	0.03	0.01	0.08

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $E_t^{c\to p}$ is the economic power of c on p that we used in our baseline specification and discussed in Section 4.1. $I_t^{c\to p}$ is the Formal Bilateral Influence Capacity of c on p as discussed in Appendix E.1. Std. Dev. (top N) is the standard deviation calculated in the subsample where countries can only be either coercers or policymakers, and countries are considered coercers if and only if there is some year within our sample in which it is in the top N of GDP. Std. Dev. (Asym.) is the standard deviation in the subsample where we drop country pairs where the policymaker has more power over the coercer than viceversa. The reported statistics are for the variables after netting out the fixed effects of our main baseline specification: α_{pc} α_{ct} and α_{pt}.

Table E.3: replication of results in Table 3 with alternative measure of power

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
$WPI^{c\to p}(\mathbf{I}_{pt})$ (lag)	0.91***	0.52***	0.55***	0.88***	0.24***	0.69***
	[0.11]	[0.11]	[0.09]	[0.11]	[0.08]	[0.11]
$REP^{c\to p}(\mathbf{I}_{pt})$ (lag)	-1.68***	-1.31**	-0.80	-1.34*	0.30	-1.15*
	[0.46]	[0.53]	[0.55]	[0.71]	[0.56]	[0.60]
Trade flow (ln)	0.01	0.00	0.00	-0.00	0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Observations	299,354	299,463	270,822	299,472	299,472	299,472
Adj. R-2	0.47	0.27	0.16	0.59	0.44	0.36
Within R-2	0.014	0.003	0.003	0.019	0.002	0.007

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $\mathbf{I}_{pt}$ is the distribution of Formal Bilateral Influence Capacities (FBIC) over p, as discussed in Appendix E.1. The variable $WPI^{c\to p}(\mathbf{I}_{pt})$ *(lag)* is the share of FBIC over p of all coercers with less FBIC over p than c in period $t-1$. $REP^{c\to p}(\mathbf{I}_{pt})$ *(lag)* is c's FBIC over p in period $t-1$. Outcomes are the log of the number of times in year t in which p sent Economic, Military, or Diplomatic Offers to c or in which c sent Economic, Military, or Humanitarian aid to p. All specifications control for the log of trade between p and c, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table E.4: replication of results in Table 7 with alternative measure of power

	c's Imports (1)	c's Exports (2)
$\widehat{WPI}^{c\to p}(\mathbf{I}_{pt})$ (lag)	1.15*	0.71*
	[0.65]	[0.37]
$\widehat{REP}^{c\to p}(\mathbf{I}_{pt})$ (lag)	-1.83	1.12
	[6.58]	[3.65]
Observations	864,140	864,148
Adj. R-2	0.30	0.33
K-Paap F	14.93	16.74

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $\mathbf{I}_{pt}$ is the distribution of Formal Bilateral Influence Capacities (FBIC) over p, as discussed in Appendix E.1. The table reports 2SLS estimates, where the second stage uses (lagged) FBIC to measure power and the first stages uses the distribution of GDP to measure power (see Equations 7, 6). The Weaker Powers Index (WPI) of country c (coercer) over country p (policymaker) is the share of total FBIC over p of all coercers with less power over p than c. The Relative Economic Power (REP) of c over p is simply the FBIC of c over p. All specifications control for coercer-policymaker fixed effects, year fixed effects, the lag of the outcome, the GDP (log), the population (log), and the GDP per capita of both c and p. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table E.5: description and summary statistics of alternative outcomes

Variable	Description of the interaction [CAMEO category]	μ	σ
Economic Agreement	Initiate, resume, improve, or expand economic exchange or cooperation. (Trade relations and other economic exchanges that are reciprocal in nature – even if the particular event in question cannot be coded as reciprocal – should be coded here) [061].	1.2	3.67
Military Agreement	Initiate, resume, improve, or expand military exchange or cooperation (Military exchanges such as joint military games and maneuvers should be coded here) [062]. Provide, share, or exchange intelligence or information [064].	0.83	0.11
Diplomatic Agreement	Initiate, resume, improve, or expand diplomatic, non-material cooperation or exchange not otherwise specified [050].	1.02	2.10
Judiciary Agreement	Initiate, resume, improve, or expand judicial cooperation [063].	0.90	0.02
Political Agreement	Ratify, sign, finalize an agreement, treaty. (Events should be coded under this category only when agreements are reportedly finalized or signed. This event code is typically reciprocal. Even when the agreement in question implies a formal commitment to boost material cooperation, provide aid, or yield in some way, the event of signing the agreement or treaty is still coded here since signing of an agreement or treaty represents diplomatic cooperation but does not guarantee implementation – whatever its terms) [057].	1.04	2.21

Table E.6: replication of results in Table 3 with alternative outcomes

	$Agreements^{c \longleftrightarrow p}$				
	Eco	Mil	Dip	Jud	Pol
	(1)	(2)	(3)	(4)	(5)
$WPI^{c \to p}$ (lag)	1.22***	0.67**	0.83***	0.43**	0.83***
	[0.23]	[0.26]	[0.20]	[0.20]	[0.20]
$REP^{c \to p}$ (lag)	-0.18	0.55	-0.44	0.88	-0.38
	[0.57]	[0.65]	[0.52]	[0.67]	[0.53]
Trade flow (ln)	0.01	-0.01	0.00	-0.01*	0.00
	[0.01]	[0.00]	[0.01]	[0.00]	[0.01]
Observations	123,895	123,895	123,895	123,895	123,895
Adj. R-2	0.66	0.41	0.64	0.17	0.64
Within R-2	0.005	0.001	0.002	0.001	0.002

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c \to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c \to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. Outcomes are the log of the number of times in year t in which country p and the US concluded an Economic, Military, Diplomatic, Judiciary, or Political agreement. All specifications control for the log of trade between p and c, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Standard errors (in parenthesis) are two-way clustered (one cluster for each c and one for each p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table E.7: replication of Table 5 with alternative outcomes

	$Agreements^{c \longleftrightarrow p}$				
	Eco	Mil	Dip	Jud	Pol
	(1)	(2)	(3)	(4)	(5)
Panel A: fall of USSR					
Stronger vs Weaker	-0.34***	-0.19***	-0.32***	-0.18***	-0.33***
	[0.03]	[0.04]	[0.03]	[0.04]	[0.04]
Observations	121,120	121,120	121,120	121,120	121,120
Adj. R-2	0.65	0.40	0.62	0.15	0.62
Within R-2	0.004	0.001	0.002	0.001	0.002
Panel B: rise of China					
Stronger vs Weaker	0.43***	0.18***	0.31***	0.25***	0.32***
	[0.04]	[0.04]	[0.04]	[0.07]	[0.04]
Observations	120,126	120,126	120,126	120,126	120,126
Adj. R-2	0.66	0.41	0.63	0.17	0.63
Within R-2	0.012	0.002	0.005	0.002	0.006

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. The variable Stronger vs Weaker estimates β of Equation 4. This coefficient captures the differential effect on each coercer c of the fall of the Soviet Union (Panel A) or of the rise of China (Panel B) comparing the outcomes related to policymakers over which c was stronger than the USSR (or China) with those policymaker over which it was weaker than the USSR (or China). Outcomes are the log of the number of times in year t in which country p and c concluded an Economic, Military, Diplomatic, Judiciary, or Political agreement. All specifications control for the log of trade between p and c, the Relative Economic Power (REP) of c over p, i.e. c's share of total economic power over p, policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table E.8: replication of Table 6 with alternative outcomes

	$Agreements^{US \longleftrightarrow h}$				
	Eco	Mil	Dip	Jud	Pol
	(1)	(2)	(3)	(4)	(5)
Panel A: fall of USSR					
Stronger vs Weaker	-0.37***	-0.44***	-0.27***	-0.33***	-0.27***
(USA only)	[0.08]	[0.13]	[0.08]	[0.12]	[0.08]
Observations	5,270	5,270	5,270	5,270	5,270
Adj. R-2	0.82	0.51	0.73	0.26	0.73
Within R-2	0.013	0.009	0.018	0.009	0.018
Panel B: rise of China					
Stronger vs Weaker	0.64***	0.48***	0.51***	1.11***	0.53***
(USA only)	[0.06]	[0.15]	[0.07]	[0.17]	[0.07]
Observations	5,279	5,279	5,279	5,279	5,279
Adj. R-2	0.82	0.50	0.73	0.26	0.73
Within R-2	0.025	0.005	0.019	0.013	0.019

Note: the unit of observation is a US-policymaker (US, p) pair in a given year. The variable Stronger vs Weaker estimates β of Equation 4 restricting $c = US$. This coefficient captures the differential effect on the US of the fall of the Soviet Union (Panel A) or of the rise of China (Panel B) comparing the outcomes related to those policymakers over which the US was stronger than the USSR (or China) with those where it was weaker than the USSR (or China). Outcomes are the log of the number of times in year t in which country p and the US concluded an Economic, Military, Diplomatic, Judiciary, or Political agreement. All specifications control for the log of trade between p and the US, the US's Relative Economic Power (REP) over p, i.e. the share of total economic power over p controlled by the US, policymaker-US fixed effects, and year fixed effects. Standard errors (in parenthesis) are robust. Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table E.9: list of coercers and sample size of subsamples of interest

Subsample	List of coercers	Sample Size
Top 5	China, Germany (or West Germany), France, Great Britain, Italy, Japan, Russia (or Soviet Union), United States	37 512
Top 10	Brazil, Canada, China, Germany (or West Germany), Spain, France, Great Britain, India, Italy, Japan, Republic of Korea, Mexico, Russia (or Soviet Union), United States	52 978
Top 20	Argentina, Australia, Austria, Belgium, Brazil, Canada, Switzerland, China, Germany (or West Germany), Spain, France, Great Britain, Indonesia, India, Iran, Iraq, Italy, Japan, Republic of Korea, Mexico, Netherlands, Poland, Russia (or Soviet Union), Saudi Arabia, Sweden, Turkey, Taiwan, United States	82 016
Top 30	Argentina, Australia, Austria, Belgium, Brazil, Canada, Switzerland, China, Germany (or West Germany), Denmark Spain, Finland, France, Great Britain, Greece, Indonesia, India, Iran, Iraq, Israel, Italy, Japan, Republic of Korea, Mexico, Nigeria, Netherlands, Norway, Poland, Portugal, Romania, Russia (or Soviet Union), Saudi Arabia, Sweden, Thailand, Turkey, Taiwan, United States, Venezuela, Vietnam, South Africa	94 938

Note: Top N is the subsample where each country c can only be either a coercer or a policymaker, and country c is a coercer if and only if there is some year within our sample when c is in the top N of that year's GDP distribution. To improve the readability of the table, we underlined countries when they appear for the first time.

Table E.10: replication of results in Table 3 focusing on subsamples of interest

	$Offers^{p\to c}$			$Aid^{c\to p}$		
	Econ	Mil	Dip	Econ	Mil	Hum
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: c in top 5 of GDP in some t and p never						
$WPI^{c\to p}$ (lag)	1.42***	1.29**	0.93**	0.92***	1.09**	1.18***
	[0.24]	[0.39]	[0.28]	[0.25]	[0.41]	[0.26]
$REP^{c\to p}$ (lag)	-1.43	-0.45	0.03	-1.02	-1.16	-1.41
	[0.83]	[1.00]	[0.70]	[0.96]	[0.83]	[1.05]
Panel B: c in top 10 of GDP in some t and p never						
$WPI^{c\to p}$ (lag)	1.28***	1.05***	0.81**	0.92***	0.91**	0.93***
	[0.26]	[0.28]	[0.31]	[0.25]	[0.39]	[0.27]
$REP^{c\to p}$ (lag)	-0.96	-0.48	0.40	-0.72	-1.04	-1.05
	[0.67]	[0.61]	[0.60]	[0.81]	[0.84]	[0.85]
Panel C: c in top 20 of GDP in some t and p never						
$WPI^{c\to p}$ (lag)	1.22***	0.78***	0.51*	0.81***	0.65**	0.80***
	[0.27]	[0.19]	[0.27]	[0.24]	[0.28]	[0.26]
$REP^{c\to p}$ (lag)	-1.38***	-1.01***	0.38	-0.96	-1.17*	-1.10
	[0.48]	[0.32]	[0.56]	[0.65]	[0.66]	[0.76]
Panel D: c in top 30 of GDP in some t and p never						
$WPI^{c\to p}$ (lag)	1.02***	0.69***	0.57**	0.80***	0.53**	0.60**
	[0.23]	[0.22]	[0.24]	[0.26]	[0.25]	[0.25]
$REP^{c\to p}$ (lag)	-0.76	-0.72*	0.25	-0.68	-0.91	-0.59
	[0.58]	[0.39]	[0.49]	[0.68]	[0.72]	[0.81]
Panel E: c has greater lag WPI over p than p over c						
$WPI^{c\to p}$ (lag)	1.31***	0.89***	0.67***	0.94***	0.69**	0.78***
	[0.23]	[0.21]	[0.23]	[0.24]	[0.27]	[0.23]
$REP^{c\to p}$ (lag)	-0.71	-0.57	0.44	-0.72	-0.54	-0.51
	[0.62]	[0.73]	[0.52]	[0.78]	[0.65]	[0.83]

Note: the unit of observation is a coercer-policymaker (c, p) pair in a given year. $WPI^{c\to p}$ *(lag)* is the Weaker Powers Index of c over p in period $t-1$, i.e., the share of total economic power over p controlled by coercers weaker than c in period $t-1$; $REP^{c\to p}$ *(lag)* is the Relative Economic Power of c over p in year $t-1$, i.e., the share of total economic power over p controlled by c in year $t-1$. Outcomes are the log of the number of times in year t in which country p sent Economic, Military, or Diplomatic Offers to the c, or in which c sent Economic, Military, or Humanitarian aid to p. All specifications control for the log of trade between c and p, , policymaker-coercer pair fixed effects, and time-varying fixed effects for each coercer and policymaker. The Panels exhibit coefficients computed from different subsamples. Panels A, B, C, and D focuses on subsamples where countries can only be either coercers or policymakers, and countries are considered coercers if and only if there is some year within our sample in which that country is in the top 5, 10, 20, or 30 of GDP (respectively). Table E.9 provides the list of coercers in each of these subsamples. Panel E focuses on the subsample where we dropped country pairs where the policymaker has more power over the coercer than viceversa. Standard errors (in parenthesis) are two-way clustered (c, p). Stars represent statistical significance of the single hypothesis test: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.