

# Swing States in Great Power Competition

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## Abstract

As great power competition between China and the United States intensifies, countries will likely face pressure to align themselves with one or the other of these nations. We used a Monte Carlo simulation to model how states may make this choice, based on incentives created by economic interdependence. The results suggest that China has a significant advantage in this competition but that there are “swing states” whose alignment with the U.S. can possibly form a balancing coalition.

## 1 Introduction

It is widely accepted that the international system has entered a period of great power competition between the United States and China (Zakaria 2008; Mearsheimer 2014; Allison 2017; Wright 2018; Helberg 2021). This interaction is characterized by a combination of cooperation and discord across various spheres of activity. The U.S. and China routinely attempt to collaborate on issues of common concern, like climate change, while simultaneously competing over trade, technology adoption, and maritime access. This state of affairs is likely to continue for the foreseeable future.

As this bipolar competition intensifies, both the U.S. and China will have incentives to pull third party countries into their own orbit and away from that of their rival. As in the Cold War, three groups are likely to emerge: a bloc of states oriented towards the U.S., one centered around China, and a loose collection of non-aligned countries. Some of these ties already exist, with China allied with North Korea, Russia, Iran, and Pakistan, and the

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United States aligned with many of its traditional Anglophone allies, as well as Japan and South Korea.

In this paper, we are not concerned with the consequences of this coalition formation process or the uses to which these alliances may be put. Instead, we would like to better understand which states are likely to join which coalition, and which are likely to remain neutral. When making such decisions, states consider a variety of strategic, political, and economic factors. These calculations are intricate and infeasible to model at scale across numerous countries. To simplify our analysis, we used a computer simulation based exclusively upon economic factors, specifically trade relationships. We focused on these incentives because they are intrinsically important, easily quantifiable, and to some extent reflective of the other geographical, historical, cultural, linguistic, and military affinities that exist between countries. Isolating trade incentives in a simulation allows us to “turn off” other confounding variables that make geopolitical alignment decisions complex, in order to better understand the implications of trade pressures alone.<sup>1</sup>

We explored the hypothetical formation of great power coalitions using a Monte Carlo simulation model. The premise of the model is that, if forced to choose sides, states will follow their trade interests, either voluntarily, due to domestic pressures, or by being externally coerced (Hirschman 1945; Mulder 2022). Our assumption is that states will compare the amount of trade they have with each coalition and tend to align themselves accordingly. Using this model, we projected how powerful each coalition will become and we identified what other analysts (Mohan 2003; Kliman and Fontaine 2013) have referred to as *swing states*. These are countries whose alignment decisions tend to have a disproportionately large effect on the balance of power.

## 2 Methodology

We modeled the process of great power coalition formation as follows. We used trade data from 2020 to establish the bilateral trade volume (the combined imports and exports of goods and services) for pairs of 193 countries.<sup>2</sup> We then seeded one coalition with the U.S. and the other with China, and randomly ordered the remaining countries.

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<sup>1</sup>This paper is part of a continued investigation into the dynamics of how power structures change over time (Poulshock 2019), using the specific example of the U.S.-China rivalry.

<sup>2</sup>For dyadic international trade statistics, we used the following sources: (1) IMF Direction of Trade Statistics (DOTS), *Goods, Value of Imports, Cost, Insurance, Freight* (TMG.CIF\_USD) (2020); and (2) World Trade Organization, *Commercial services exports by sector and partner – annual, BOP6 - S - Memo item: Total services* (2020). We ignored international financial flows, such as foreign investment, as these values can be negative and therefore problematic to interpret in this context. Taiwan does not have any trade data because in this data set it is aggregated with China.

Each country in the list was then assigned to one coalition or the other, or it remained neutral. The sole criterion for making this decision was the state’s trade volume with the two existing coalitions. The more equal those two trade volumes, the more likely it was for that state to remain neutral.<sup>3</sup> If a country was not randomly chosen to be neutral, it was randomly assigned to one of the coalitions with a probability proportional to the trade volume with that coalition. For example, if a state had a total trade volume of 60 units with China’s coalition and 40 units with the U.S.’s coalition, it would have a 60% chance of joining China’s side.

This selection process was repeated for every country in the ordered list. After the two coalitions were formed, we estimated the strength of each using the total national wealth<sup>4</sup> of the coalition members as an overall proxy for national power. The justification for the use of national wealth is explained in the companion paper (Poulshock 2022).<sup>5</sup> To compare the relative power of the two coalitions, we used the ratio formed by dividing the total wealth of China’s coalition by the total wealth of the U.S.’s coalition.

States do not make their coalition decisions simultaneously and are influenced by other states’ prior decisions.<sup>6</sup> As a result, the order in which countries decide is significant in that coalitions typically cascade depending upon the economic weight and interconnectedness of the early joiners. Therefore, it was necessary to repeat the process above numerous times as a Monte Carlo<sup>7</sup> simulation and aggregate the results. Fundamentally, we wanted to know: (1) the relative strength of the emergent coalitions, and (2) whether there are any swing states that have a disproportionate impact on the ratio of coalition sizes.<sup>8</sup>

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<sup>3</sup>The probability of neutrality was defined as  $\sqrt{s/l}$ , where  $s$  is the smaller of the two trade volumes and  $l$  is the larger. This is a simple way to increase the likelihood of neutrality for states caught between the two great powers. It yielded a neutrality rate of around 58%, which is comparable to the percentage of non-aligned countries during the Cold War.

<sup>4</sup>We relied on the World Inequality Database for market valuations of national wealth based on purchasing price parity. We used data from 193 countries for the year 2020. Market value was used because book value statistics were not available for China. Venezuela was omitted because the national wealth statistics were implausibly high. No data was available for North Korea.

<sup>5</sup>c.f. Tellis 2000.

<sup>6</sup>We assume that all decisions are made under the same trade conditions as 2020, which is admittedly a simplification given that the actual process of coalition formation would unfold over a longer time frame, and with intervening adjustments to bilateral trade.

<sup>7</sup>There are three sources of randomness in the procedure just outlined: (1) the order in which states decide, (2) each state’s decision about whether to remain neutral, and (3) each state’s decision about which coalition to join.

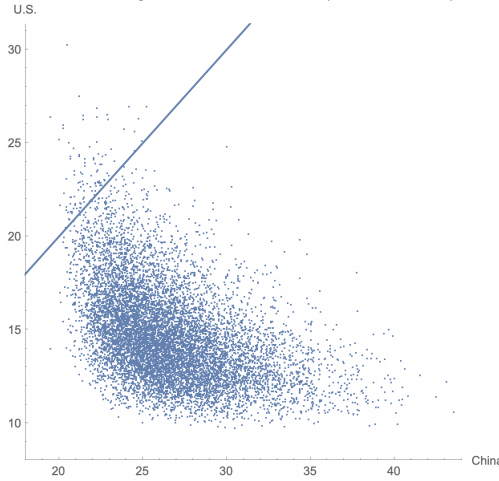
<sup>8</sup>We defined a state’s *swing* such that it could also be applied in the U.S. Electoral College context, where the term *swing state* emerged:

$$\text{swing} = \text{Min}(|a - \bar{\mathbf{c}}_1|, |a - \bar{\mathbf{c}}_2|) \quad (1)$$

Here  $\mathbf{c}_1$  is a vector of simulation outcomes in which the state makes one choice,  $\mathbf{c}_2$  are outcomes in which it makes the other choice, and  $a$  is the average of all outcomes. The resulting number ranks states based on the variability they introduce into the outcome by virtue of their sizes and inclinations. A large state that

### 3 Results and Discussion

The simulation results, based on 100,000 Monte Carlo runs, suggest that China’s coalition is highly likely to dominate that of the U.S. In 98.8% of the simulations, China’s coalition was the wealthier one and on average it was 1.88 times wealthier. These outcomes are plotted in Figure 1, with each point representing the total strength of each coalition. The total wealth of China’s coalition is plotted on the x-axis; the U.S.’s total is plotted on the y-axis. Points above the diagonal line are outcomes where the U.S. coalition was stronger.



**Figure 1:** Coalition strengths in the simulation outcomes (USD 2020 Trillions).

In the simulations, certain states demonstrated tendencies to align with one great power or the other, or to remain neutral. For example, the results suggest that China can count on Turkmenistan, Iran, the Democratic Republic of the Congo, and Afghanistan for support, and that the U.S. has the allegiance of Canada, Mexico, and a variety of small European and Central American countries. Consistently neutral states included Peru, India, Jordan, and Singapore, which had neutrality rates of over 85%. Table 1 lists the top ten countries in each of these three categories.<sup>9</sup>

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is equally inclined toward both choices will have high swing. It will be lower for other states, including large states such as California, that are strongly inclined toward one choice over the other. Unlike other measurements of voting power (Felsenthal and Machover, 1998; Gelman 2002), this formula handles continuous rather than discrete outcomes and agents are assumed to have prior biases regarding the available choices.

<sup>9</sup>Only the 100 wealthiest countries are included in these tables.

Ally of China	Frequency
Turkmenistan	81.8%
Iran	72.9%
DR Congo	69.9%
Afghanistan	62.7%
Angola	60.4%
Myanmar	56.7%
Uzbekistan	56.0%
Syria	54.8%
Oman	52.9%
Iraq	50.5%

Ally of U.S.	Frequency
Canada	49.6%
Luxembourg	49.4%
Mexico	46.7%
Ireland	46.0%
Guatemala	40.1%
Costa Rica	38.8%
Panama	35.1%
Dominican Rep.	34.7%
Bahrain	29.9%
Switzerland	29.4%

Neutral	Frequency
Peru	91.5%
India	88.7%
Jordan	88.6%
Singapore	87.6%
Argentina	86.3%
Sri Lanka	85.0%
Bangladesh	83.4%
Ecuador	83.4%
Japan	83.1%
Morocco	82.3%

**Table 1:** Tendencies to join a coalition or remain neutral.

A natural question is whether some states have a more pronounced tendency than others to alter the ultimate balance of power. A state with high *swing* would be one that is both relatively wealthy and that chooses to side with each great power with an equal likelihood. We computed each state’s swing based on the probabilities with which it chose to align with the U.S. or China, and the average coalition wealth ratio when it was seeded to either China’s or the U.S.’s coalition. Table 2 lists the leading swing states based on these simulations.

Swing Rank	Wealth Rank	Country
1	1	India
2	3	Germany
3	2	Japan
4	5	France
5	24	Netherlands
6	13	Italy
7	14	Spain
8	8	United Kingdom
9	9	Turkey
10	4	South Korea

**Table 2:** Ranking of countries based on their ability to swing the U.S.-China balance of power. The wealth rank omits China and the U.S.

While wealth is integral to what makes a state a swing state, it is not everything, as Table 2 illustrates. The Netherlands, whose wealth is less than 3% that of China’s, has the fifth highest ability to swing the balance of power. Conversely, wealthy countries like Indonesia and Russia have swing ranks of 18 and 16, respectively, due to their tighter economic coupling with China. It is notable that the top ten swing states are all traditional allies of the United States. This suggests that, while the U.S. may assume it has their allegiance, these countries face genuine geopolitical dilemmas based on their economic entanglement with China. India’s preeminence as a global swing state has been previously observed by (Mohan 2006).

Although we used national wealth as the measure of coalitional power, the results are qualitatively similar if GDP (Purchasing Power Parity) is used instead. In that case, in 89.7% of the simulations, China’s coalition was the wealthier one and on average it was 1.46 times wealthier. The tendencies towards allegiance and neutrality are exactly the same, because they are dependent upon trade volume rather than national power. The leading swing states

are essentially the same, with some minor differences in ordering and with Poland replacing South Korea in the #10 spot.

## 4 Conclusions

We have described a Monte Carlo simulation model of great power coalition formation, premised on the idea that states will tend to align themselves with the great powers according to their trade interests. The model suggests that if trade relationships were the driving force behind state decisions about coalition selection, then China has the capacity to forge a coalition that is 2-4 times wealthier than that of the United States. It is notable that for many of the U.S.'s presumptive allies, siding with the U.S. is not a foregone conclusion. Canada and Mexico align themselves with the U.S. less than 50% of the time, which is yet more frequent than other traditional allies like the UK (23%), France (14%), Germany (11%), and Australia (10%).

This outcome is not preordained, however, and there are ways for the U.S. to assemble a balancing coalition approximately equal to that of China's. Let's consider a simulation using the 25+2 wealthiest countries based on more realistic initial coalitions, i.e. invoking knowledge of the world beyond mere trade relations. First, we can assume that Russia, Iran, Pakistan, and North Korea align with China, and that Indonesia, UAE, and Nigeria do the same based on economic interests. Let's then conservatively assume that India, Turkey, Brazil, Saudi Arabia, Italy, Mexico, Egypt and Argentina all remain neutral. Given those conditions, the U.S. can nonetheless form a balancing coalition if it can convince Japan, Germany, South Korea, France, Taiwan, the UK, Spain, Canada, Australia,<sup>10</sup> and the Netherlands all to align with it. Due to historic bonds, that outcome is feasible; however, those states' countervailing economic incentives are real and would need to be addressed.

Like all models, this one is a simplification of a complex reality that is inherently unpredictable. It ignores many factors that drive geopolitical alignments and its fundamental premise that states align with their economic interests is intentionally reductionist. This model could be naturally extended by adding other variables, such as security and political considerations. We chose this deliberately minimal approach to expose the underlying economic incentives currently shaping the world power structure of the 21st century.

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<sup>10</sup>Australia would be a more difficult case if not for China's attempted economic coercion of it in 2020 and its subsequent defense cooperation with the U.S. and UK (Sanger 2021).

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