Is China's Belt and Road Initiative a Zero-Sum Game?

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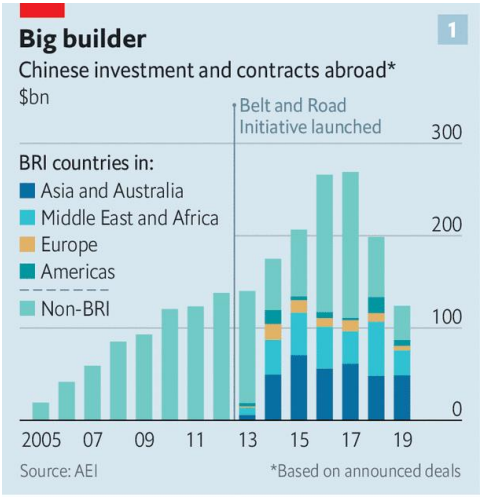


The Main Question(s)

- Does infrastructure investment in foreign countries affect trade and investment flows between recipient and third-party countries?
- The playground: the Belt and Road Initiative (BRI).

- When China invests in infrastructure in Greece, does trade and investment between Greece and say, Spain:
  - Increase? (“lifting all boats”)
  - Decrease? (“zero sum”)
- Do these effects depend on how politically aligned the third-party country is?

Piraeus Port

- Piraeus Port is the largest port in Greece.
- On Aug 10, 2016, COSCO Shipping (Hong Kong) Co Ltd, a subsidiary of China COSCO Shipping Group, became a controlling shareholder of the port and started operating the facility.
- Around 290 million euros invested by the company for the expansion of a cruise terminal, improvement of a ship repair wharf, new loading facilities, and warehouses.

"Under the joint operation of Chinese and Greek enterprises, ***the port's infrastructure conditions and operational capabilities have been greatly improved****. The freight hub has become increasingly prominent, not only providing more jobs, but also promoting local economic development and becoming a model of win-win cooperation under the Belt and Road Initiative."*

https://www.prnewswire.com/news-releases/belt-and-road-projects-past-present-future-300840574.html

Main Findings

Sample: 2013 to 2018 and covering 1,135 BRI projects in 110 countries, for a total of USD 625 billion.

- **"Zero-sum" hypothesis**: The increase in cross-border economic activity (imports, exports, and trade) with China is accompanied by a decrease in activity with third party countries. M&A flows are a bit murkier.

- BRI countries trade and invest
  - more with other countries that are politically aligned with China,
  - but less with countries that have recently been visited by the Dalai Lama.

Belt-and-Road Initiative (BRI)

It is a series of (mostly) infrastructure projects aimed at connecting countries.

Railways, ports, airports, energy grids, etc.

It was lunched in 2013. To date, it involves **71 countries**. Including China, those account for **65% of the world's population and 40% of global gross domestic product**.

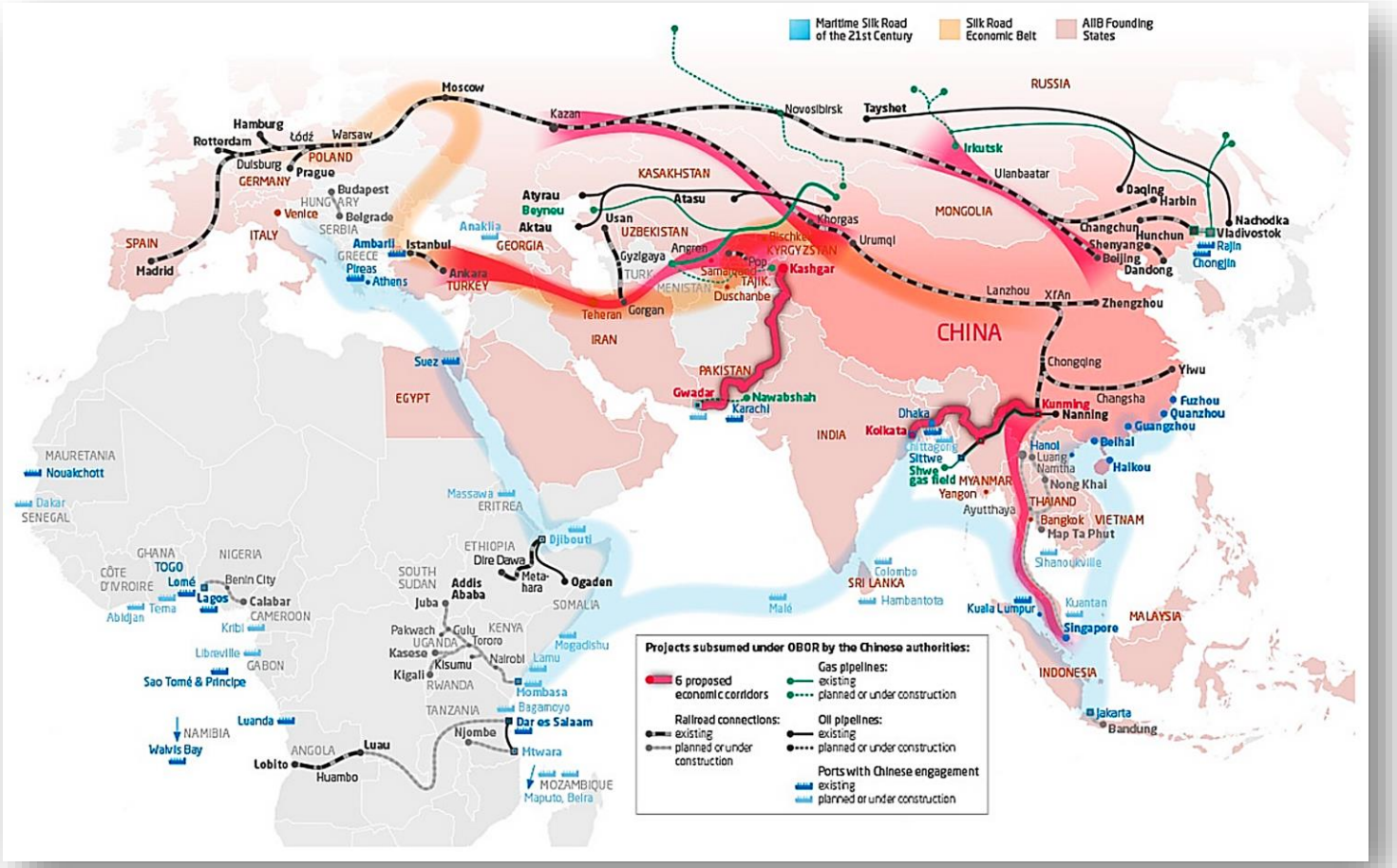
Depending on estimates, **USD 500-750 bn so far**. Planned another **USD 1-1.5 trillion by 2030**. Some estimated as high as USD 6 trillion.

Marshall plan USD 15 billion, USD 130 billion in 2018 terms.

According to the World Bank: If completed, BRI transport projects could reduce travel times along economic corridors by 12%, increase trade between 2.7% and 9.7%, increase income by up to 3.4%, and lift 7.6 million people from extreme poverty.

https://www.worldbank.org/en/topic/regional-integration/brief/belt-and-road-initiative

Belt-and-Road Initiative (BRI)



Source: Mercator Institute for China Studies

Some Generalizations

DISCLAIMER: Very heterogenous set of projects!

- Debt financing, with loans coming from Chinese state-owned banks, or multi-lateral lenders (Asian Development Bank).
- Borrower is usually the recipient party government.
- Chinese banks usually provide between 50-75% of capital.
- Contracts are usually awarded to Chinese firms, using their own workers.
- Terms of loans have been described as “market-based” – there is little evidence of concessionary lending. But generous renegotiations.

Fit in the Lit

- Investment in infrastructure leads to greater cross-border economic activity, as it lowers transportation and transaction costs (Donaldson, 2010; Celbis, Nijkamp, Poot, 2014).
- Countries might enhance their trade volumes and cross-border flows of capital by investing in the infrastructure of trading partners—especially if those trading partners have a relatively low level of development (Abe and Wilson, 2016).
- BRI projects increase trade and investment flows between recipient countries and China (Donaldson, 2010; Celbis, Nijkamp, Poot, 2014).
  - But there is a bit unresolved endogeneity issue.

Our Novel Contributions

- We recognize trade with China is endogenous.
- We focus on trade + M&A flows between BRI and third-party countries.
- We find evidence of a zero-sum effect. Trade is diverted towards China – and towards other aligned countries. M&A results are a bit murkier.
- We document that political alignment has consequences for trade with the BRI network of countries.

Data

American Enterprise Institute database “China Global Investment Tracker” – November 16, 2019 download date.

Spans 2013 to 2018 and it covers 1,135 projects in 110 countries, for a total value of approximately USD 625 bn.

The average cumulative BRI investment in our sample accounts for 1.6% of the recipient country’s GDP.

BRI investments account for:
137% of GDP in Laos
15% of GDP in Pakistan
9% of GDP in Bangladesh.

Descriptive Stats – By Country

BRI country	Year of first BRI investment	Cumulative BRI investment (USD mn)	Total number of BRI projects	Cumulative BRI investment to 2018 GDP
Pakistan	2013	43,840	56	14.98%
Malaysia	2013	29,777	50	6.76%
Singapore	2013	29,359	51	7.65%
Russian Federation	2013	27,293	37	1.36%
Indonesia	2013	26,028	56	1.97%
Nigeria	2013	23,382	26	4.35%
Italy	2014	23,157	23	0.94%
United Arab Emirates	2014	21,816	38	4.76%
Bangladesh	2013	20,124	34	9.00%
Lao People's Democratic Republic	2013	19,947	34	137.38%
Other countries	-	360,003	730	7.07%
Total		624,726	1,135	

Model

$$Trade/GDP_{i,j,t} = \alpha + \beta \times Post\ BRI_{i,t-1} + \gamma \times China_j + \delta \times Post\ BRI_{i,t-1} \times China_j + \vec{\kappa} \times \overrightarrow{Country\ pair}_{i,j,t} + \lambda \times Year_t + \theta \times Country_i + \tau \times Country\ partner_j + \varepsilon_{i,j,t}.$$

The response variable is the monetary value of total trade between countries *i* and *j* during year *t*, scaled by the GDP of country *i*.
In alternative specifications, we replace *Trade/GDP* with *Imports/GDP* and *Exports/GDP*, to investigate the impact on imports and exports distinctly. Then, *M&A inflows/outflows*.

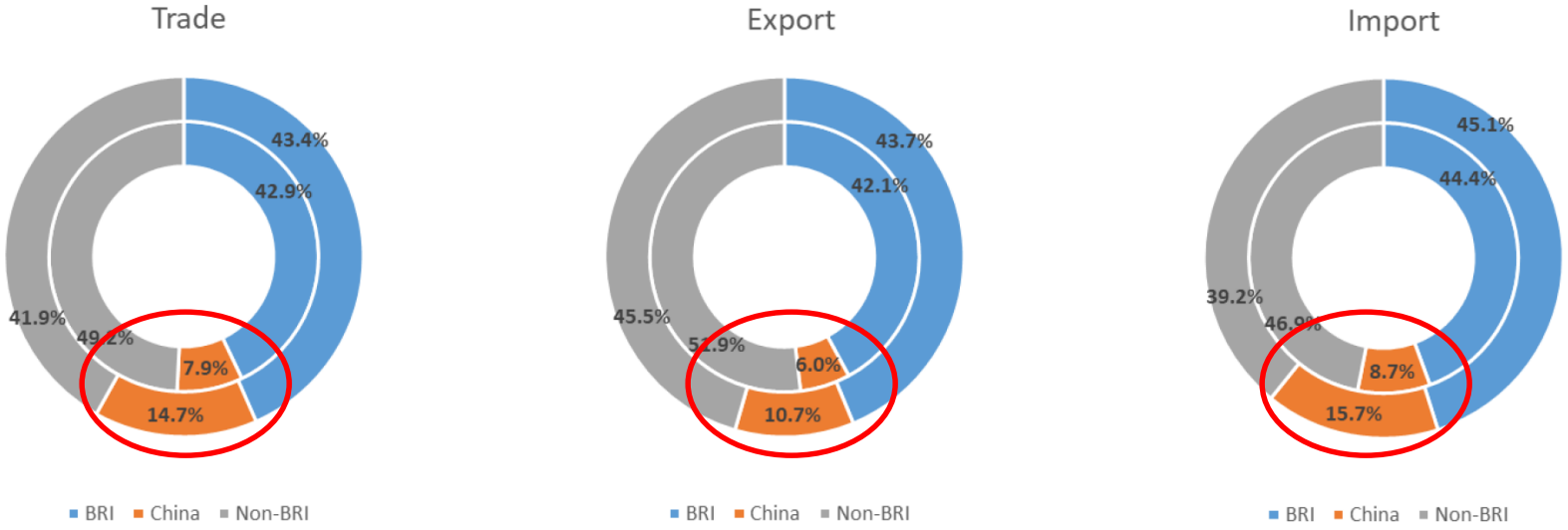
The main variable of interest is *Post BRI*—a binary country-year variable, set equal to one starting on the year following the first BRI investment in the country of interest.

The variable *China* is a binary variable, set equal to one, when the "partner" country in the dyad is China.

The vector $\overrightarrow{Country\ pair}_{i,j,t}$ refers to a set of country-pair variables that prior literature has found related to bilateral trade flows: *Contiguous*, *Common language*, *Common colony*, *Colony*, *ln(Product GDP)*, *ln(Product GDP per capita)*, *ln(Distance)*, *ln(Product Surface)*, and *Landlocked*.

The model includes fixed effects for year, country, and "partner" country. Standard errors are clustered at the country-level following Bertrand and Mullainathan (2003).

Univariate Aggregated Trade



- The increase of trade with China following the BRI initiatives comes at the expense of trade with other non-BRI countries.
- We find similar patterns when we disaggregate total trade into imports and exports.

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	*Trade/GDP*	*EX/GDP*	*IM/GDP*	*Trade/GDP*	*EX/GDP*	*IM/GDP*
Post BRI	-0.001	-0.001	-0.001			
	(-3.370)***	(-2.036)**	(-2.958)***			
BRI investment/GDP				-0.004	-0.002	-0.003
				(-3.193)***	(-2.149)**	(-2.977)***
China	0.048	0.023	0.027	0.052	0.024	0.029
	(16.965)***	(9.333)***	(18.446)***	(18.546)***	(10.516)***	(18.957)***
Post BRI × China	0.03	0.012	0.019			
	(6.849)***	(3.758)***	(7.076)***			
BRI investment/GDP × China				0.15	0.065	0.084
				(4.594)***	(2.424)**	(3.992)***
Ln (product GDP)	> -0.001	-0.001	0.001	> -0.001	-0.001	0.001
	(-0.146)	(-1.275)	(-1.112)	(-0.344)	(-1.454)	(-0.977)
Ln (product GDP/capita)	0.008	0.005	0.004	0.009	0.006	0.005
	(8.568)***	(6.279)***	(8.778)***	(9.702)***	(7.114)***	(9.685)***
Ln (distance)	-0.008	-0.004	-0.005	-0.008	-0.004	-0.005
	(-41.946)***	(-34.899)***	(-40.738)***	(-42.121)***	(-34.979)***	(-40.908)***
Common language	0.003	< 0.001	0.003	0.003	< 0.001	0.003
	(6.032)***	(-0.909)	(11.351)***	(6.173)***	(-1.013)	(11.481)***
Contiguous	0.027	0.011	0.015	0.027	0.011	0.015
	(12.338)***	(9.465)***	(11.705)***	(12.284)***	(9.451)***	(11.673)***
Landlocked	0.004	0.002	0.003	0.005	0.002	0.004
	(6.631)***	(4.038)***	(8.388)***	(7.586)***	(4.784)***	(9.089)***
Ln (product surface)	< 0.001	0.001	> -0.001	< 0.001	0.001	> -0.001
	(-0.4)	(-1.323)	(-0.480)	(-0.531)	(-1.469)	(-0.458)
Common colony	-0.005	-0.002	-0.005	-0.005	-0.002	-0.005
	(-13.574)***	(-6.879)***	(-18.080)***	(-13.532)***	(-6.837)***	(-18.051)***
Colony	0.021	0.01	0.011	0.021	0.01	0.011
	(14.385)***	(10.571)***	(14.816)***	(14.454)***	(10.641)***	(14.769)***
Constant	-0.065	-0.018	-0.055	-0.078	-0.023	-0.066
	(-3.105)***	(-0.945)	(-4.498)***	(-3.696)***	(-1.281)	(-5.036)***
Year FE	YES	YES	YES	YES	YES	YES
Country *i* FE	YES	YES	YES	YES	YES	YES
Country *j* FE	YES	YES	YES	YES	YES	YES
Observations	83,523	69,033	75,929	83,523	69,033	75,929

Base Model – Trade

Note the dep. Variables:

1. Total trade
2. Exports
3. Imports

Always, scaled by GDP

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Following BRI investments, trade declines with third-party countries

Both imports and exports

But trade with China increases

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Common colony	-0.005	-0.002	-0.005	-0.005	-0.002	-0.005
	(-13.574)***	(-6.879)***	(-18.080)***	(-13.532)***	(-6.837)***	(-18.051)***
Colony	0.021	0.01	0.011	0.021	0.01	0.011
	(14.385)***	(10.571)***	(14.816)***	(14.454)***	(10.641)***	(14.769)***
Constant	-0.065	-0.018	-0.055	-0.078	-0.023	-0.066
	(-3.105)***	(-0.945)	(-4.498)***	(-3.696)***	(-1.281)	(-5.036)***
Year FE	YES	YES	YES	YES	YES	YES
Country *i* FE	YES	YES	YES	YES	YES	YES
Country *j* FE	YES	YES	YES	YES	YES	YES
Observations	83,523	69,033	75,929	83,523	69,033	75,929

Following BRI investments, trade declines with third-party countries

Both imports and exports

But trade with China increases

The effects are proportional to the size of the cumulative BRI investment in the country, scaled by GDP

Politics

Alignment

	Trade/GDP		*EX/GDP*		*IM/GDP*	
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	*All votes*	*Important votes*	*All votes*	*Important votes*	*All votes*	*Important votes*
BRI investment	-0.024	-0.011	-0.018	-0.008	-0.009	-0.005
	(-4.808)***	(-3.544)***	(-7.473)***	(-3.440)***	(-1.814)*	(-1.775)*
China	0.053	0.052	0.025	0.026	0.03	0.029
	(18.773)***	(17.474)***	(10.715)***	(9.809)***	(19.457)***	(19.348)***
BRI investment ×	0.135	0.106	0.052	0.035	0.079	0.068
China	(4.119)***	(3.292)***	(1.930)*	(-1.392)	(3.728)***	(3.121)***
Alignment	-0.004	-0.001	-0.003	-0.001	-0.002	< 0.001
	(-3.568)***	(-1.602)	(-2.608)***	(-1.971)**	(-3.054)***	(-0.049)
BRI investment ×	0.035	0.021	0.03	0.017	0.011	0.007
Alignment	(4.548)***	(3.175)***	(7.645)***	(3.574)***	(-1.438)	(-1.165)

Both imports and exports drop, but exports effects are mitigated by the degrees of alignment with China

	Trade/GDP		*EX/GDP*		*IM/GDP*	
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Dalai Y1	Dalai Y1-3	Dalai Y1	Dalai Y1-3	Dalai Y1	Dalai Y1-3
BRI investment/GDP	-0.002	-0.001	-0.001	> -0.001	-0.002	-0.001
	(-2.237)**	(-0.870)	(-1.098)	(-0.141)	(-2.876)***	(-2.017)**
China	0.052	0.052	0.024	0.025	0.029	0.03
	(18.694)***	(18.650)***	(10.611)***	(10.627)***	(19.138)***	(19.012)***
BRI investment/GDP	0.149	0.147	0.064	0.063	0.084	0.083
× *China*	(4.555)***	(4.507)***	(2.383)**	(2.348)**	(3.974)***	(3.938)***
Dalai	> -0.001	< 0.001	< 0.001	< 0.001	> -0.001	< 0.001
	(-0.104)	(-0.814)	(-0.029)	(-0.427)	(-0.162)	(-0.838)
BRI investment/GDP	-0.023	-0.016	-0.015	-0.009	-0.007	-0.006
× *Dalai*	(-2.755)***	(-4.429)***	(-3.418)***	(-3.978)***	(-0.940)	(-2.108)**

Both imports and exports drop, with the effects being strongest in countries that receive the Dalai Lama

BRI network effects – trade

	Trade/GDP	*EX/GDP*	*IM/GDP*
Post BRI	-0.001***	-0.001***	-0.001***
	(-5.776)	(-4.987)	(-4.186)
China	0.031***	0.011***	0.020***
	(22.446)	(10.063)	(29.720)
Post BRI × China	0.035***	0.015***	0.021***
	(7.427)	(4.281)	(7.691)
BRI network	-0.004***	-0.002***	-0.002***
	(-36.385)	(-29.678)	(-26.166)
Post BRI × BRI network	0.001***	0.000***	0.000***
	(4.164)	(3.584)	(3.555)

Trade increases with China and with the BRI network – but decrease with non-BRI third-party countries

	Trade/GDP	*EX/GDP*	*IM/GDP*
BRI investment/GDP	-0.006***	-0.003***	-0.003***
	(-6.469)	(-5.368)	(-4.354)
China	0.034***	0.012***	0.021***
	(25.025)	(11.789)	(30.729)
BRI investment/GDP × China	0.163***	0.070**	0.092***
	(4.767)	(2.524)	(4.248)
BRI network	-0.004***	-0.002***	-0.002***
	(-39.875)	(-33.352)	(-28.245)
BRI investment/GDP× BRI network	0.006***	0.003***	0.003***
	(6.793)	(5.524)	(4.119)

The effects are proportional to the size of the cumulative investment

M&As

Variable	(1) *Inflow value*	(2) *Inflow count*	(3) *Inflow days*	(4) *Outflow value*	(5) *Outflow count*	(6) *Outflow days*
Post BRI	-0.074	-0.004	0.155	0.053	0.002	-0.336
	(-1.784)*	(-1.694)*	(-0.789)	(1.712)*	(-1.23)	(-1.207)
China	0.461	0.03	2.546	0.429	0.037	-0.177
	(1.687)*	(1.931)*	(2.166)**	(1.946)*	(2.947)***	(-0.108)
Post BRI × China	1.55	0.098	-0.789	-0.143	-0.004	0.125
	(4.331)***	(4.374)***	(-1.918)*	(-0.646)	(-0.194)	(-0.205)

M&A:
We look at
- Value
- Count
- Days-to-completion

Inflows and Outflows

Variable	(1) *Inflow value*	(2) *Inflow count*	(3) *Inflow days*	(4) *Outflow value*	(5) *Outflow count*	(6) *Outflow days*
BRI investment/GDP	-0.361	-0.017	0.892	0.036	0.004	-8.777
	(-4.149)***	(-3.311)***	(-0.443)	(-0.759)	(-1.353)	(-2.134)**
China	0.78	0.05	2.32	0.4	0.038	-0.671
	(2.899)***	(3.261)***	(2.024)**	(1.852)*	(3.054)***	(-0.434)
BRI investment/GDP × China	-0.646	-0.027	-18.128	-2.005	-0.142	24.995
	(-0.877)	(-0.697)	(-2.832)***	(-6.745)***	(-6.029)***	(2.778)***

A bit murky. Inflows to China increase, but the result does not hold with the continuous investment variables.

Outflows to China DECLINE

M&As – Political alignment

	Inflow value		*Inflow count*		*Inflow days-to-completion*	
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	*All votes*	*Important votes*	*All votes*	*Important votes*	*All votes*	*Important votes*
BRI investment/GDP	-3.845	-1.768	-0.232	-0.101	8.282	0.291
	(-11.770)***	(-8.100)***	(-11.605)***	(-7.877)***	(1.777)*	(-0.059)
China	0.924	0.78	0.059	0.054	2.674	2.42
	(3.408)***	(2.673)***	(3.811)***	(3.271)***	(1.789)*	(-1.571)
BRI investment/GDP ×	-3.117	-2.958	-0.18	-0.166	-5.789	-19.946
China	(-4.127)***	(-3.085)***	(-4.545)***	(-3.417)***	(-0.563)	(-1.563)
Aligned	-0.215	-0.197	-0.013	-0.014	-0.342	0.487
	(-2.778)***	(-2.884)***	(-2.774)***	(-3.718)***	(-0.308)	(-0.457)
BRI investment ×	5.984	3.8	0.371	0.229	-20.348	5.705
Alignment	(12.135)***	(8.676)***	(12.121)***	(8.897)***	(-1.569)	(-0.377)

	Outflow value		*Outflow count*		*Outflow days-to-completion*	
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	*All votes*	*Important votes*	*All votes*	*Important votes*	*All votes*	*Important votes*
BRI investment/GDP	-2.042	-0.723	-0.12	-0.04	-10.966	-17.771
	(-12.739)***	(-6.395)***	(-11.612)***	(-5.802)***	(-0.878)	(-1.296)
China	0.483	0.518	0.043	0.04	-1.21	-0.689
	(2.227)**	(2.215)**	(3.441)***	(3.017)***	(-0.634)	(-0.342)
BRI investment/GDP	-3.481	-3.422	-0.231	-0.227	22.446	10.262
× *China*	(-11.169)***	(-9.229)***	(-9.423)***	(-8.196)***	(-1.552)	(-0.309)
Aligned	-0.106	-0.057	-0.007	-0.003	0.65	-0.231
	(-1.834)*	(-1.058)	(-1.865)*	(-0.997)	(-0.449)	(-0.182)
BRI investment ×	3.57	1.993	0.213	0.115	4.061	28.664
Alignment	(13.847)***	(7.988)***	(12.673)***	(7.483)***	(-0.184)	(-0.659)

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Alignment	(13.847)***	(7.988)***	(12.673)***	(7.483)***	(-0.184)	(-0.659)

Limitations and Extensions

- The evidence is, of course, BRI specific.

- Dyadic analysis masks aggregate effects on recipient countries.
  - We need to find a better way to study aggregate, network effects.

- We are still digging into the M&A side.
  - Why the negative coefficients on China post BRI?
  - What happens to deal characteristics?

Conclusion

- We recognize trade with China is endogenous.
- We focus on trade between BRI and third-party countries.
- We find evidence of a zero-sum effect. Trade is diverted towards China – and towards other aligned countries.
- We document that political alignment has consequences for trade with the BRI network of countries.