

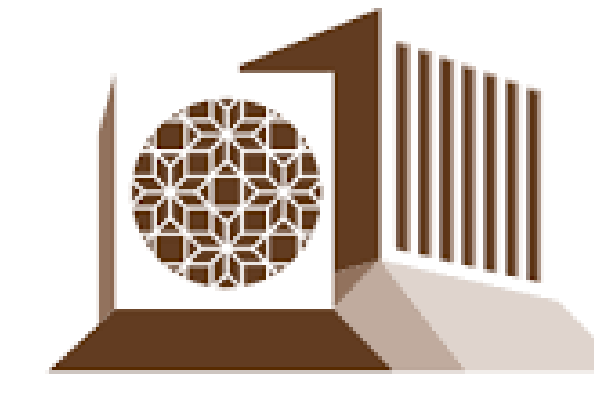
THE GRAVITY OF DISTANCE: EVIDENCE FROM A TRADE EMBARGO

Afnan Al-Malk,¹ Jean-Francois Maystadt,² Maurizio Zanardi³

¹ Lancaster University, al-malk@lancaster.ac.uk

² UCLouvain & Lancaster University, j.maystadt@lancaster.ac.uk

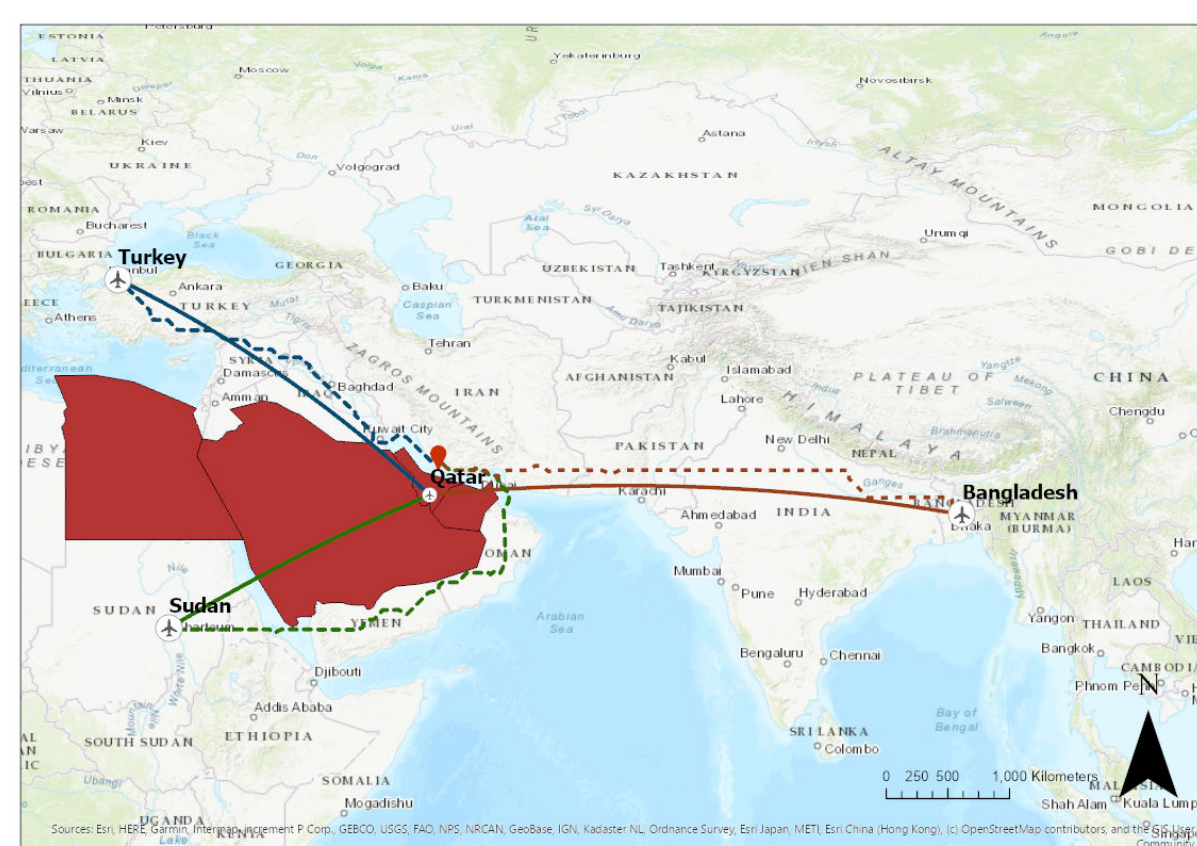
³ University of Surrey, m.zanardi@surrey.ac.uk



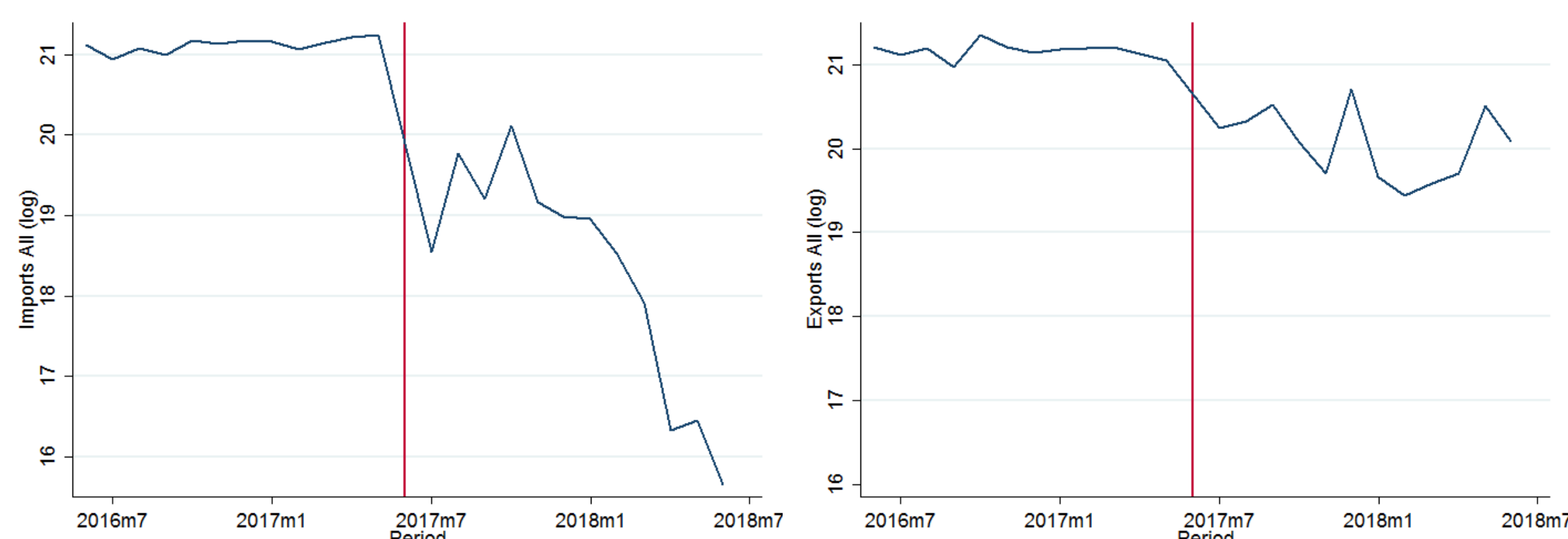
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Background

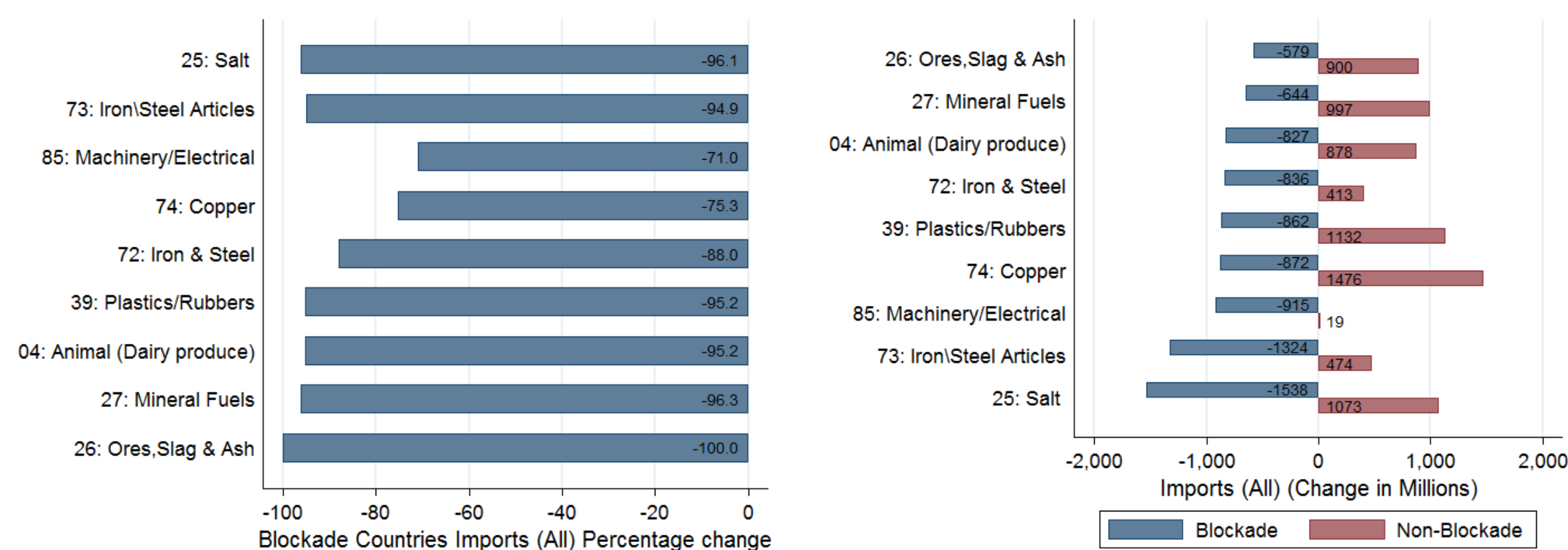
On June 5th 2017, Saudi Arabia, the UAE, Bahrain and Egypt severed all diplomatic ties with the state of Qatar. They closed air-spaces, land border, and blocked access to seaports. As a result, flights had to be diverted, resulting in longer routes from Doha to other airports of non-blockading countries. Some routes were more affected due to their geographical location as shown in the following map.



The immediate consequence of the blockade was a collapse in imports to Qatar from the blockading countries. Exports over the same period, however, seem not to have been affected.



Taking pre-embargo top 10th percentile imported sectors from blockading countries, we see that there was a substantial decline that was somehow compensated by non-blockading countries. We need to better understand how it is affected by the distance shock.



Objective & Contribution

- Quantify the elasticity of trade to distance.
- Long tradition using cross-sectional variation (Frankel and Romer, 1999): elasticity of -0.9 (Head and Mayer, 2014).
- Limits of cross-sectional models → Exploiting external shocks on distance (similar to Feyrer, 2009).
- Exploiting unexpected changes in air travel costs due to sudden closure of air spaces surrounding Qatar in June 2017, we find an elasticity around -0.3 in our main result.

Data and Model

Data:

- Monthly data on exports and imports at HS-2 level over 2015M1-2019M4 are obtained from Qatar Planning and Statistics Authority.
- Geodisc distance between Doha and rest of world airports with and without blocked airspaces using geocoded data.

Model: Our main analysis uses 144 countries and two aggregated periods: one-year pre- and post-embargo. The monthly disaggregation is not used to deal with seasonal fluctuations, also the blockade varies at this pre/post period level not at the monthly level. The empirical equation linking trade and air distance is given by:

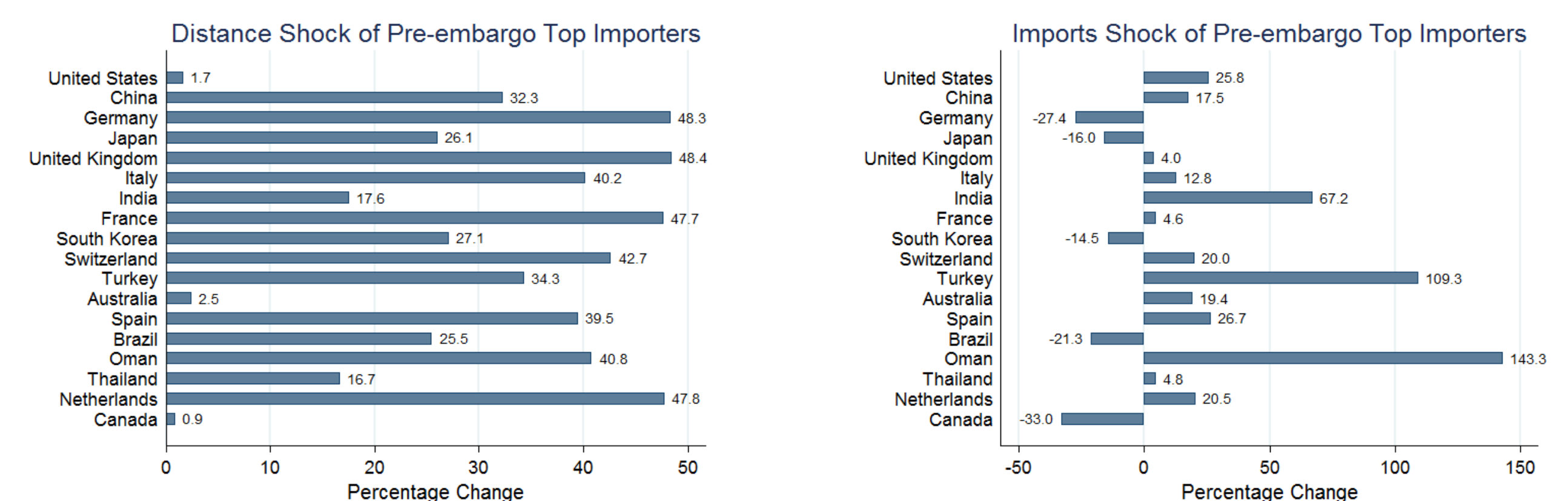
$$X_{jt} = \exp[\beta_1 \ln(Air_{jt}) + \pi_j + Post_t] \times \nu_{jt}$$

- X_{jt} trade between Qatar and country j at time t
- Air_{jt} is the computed air distance between Qatar and country j 's airport, with different value pre- vs post-embargo
- π_j is country fixed effects that controls for unobservable country-specific factors
- $Post_t$ is a time indicator that is 0 pre-embargo and 1 post-embargo to control for time trend common across all countries
- ν_{jt} is the error term

We estimate the equation in multiplicative form using Poisson pseudo-maximum-likelihood (PPML) estimator to obtain consistent estimates and to deal with zero trade flows. Also, we cluster standard errors at the country level.

Data and Model

The following two figures shows pre- embargo top importers percentage change in distance shock and the percentage change in imports between pre and post embargo period. Although there is variation in distance shock, there is no clear match that a rise in distance is associated with imports falling. So, we need an econometric model to control for country effects and identify the role of distance.



Results

Our results identify how the resulting change in trade is reallocated following the exogenous variation in air distance with non-blockading countries.

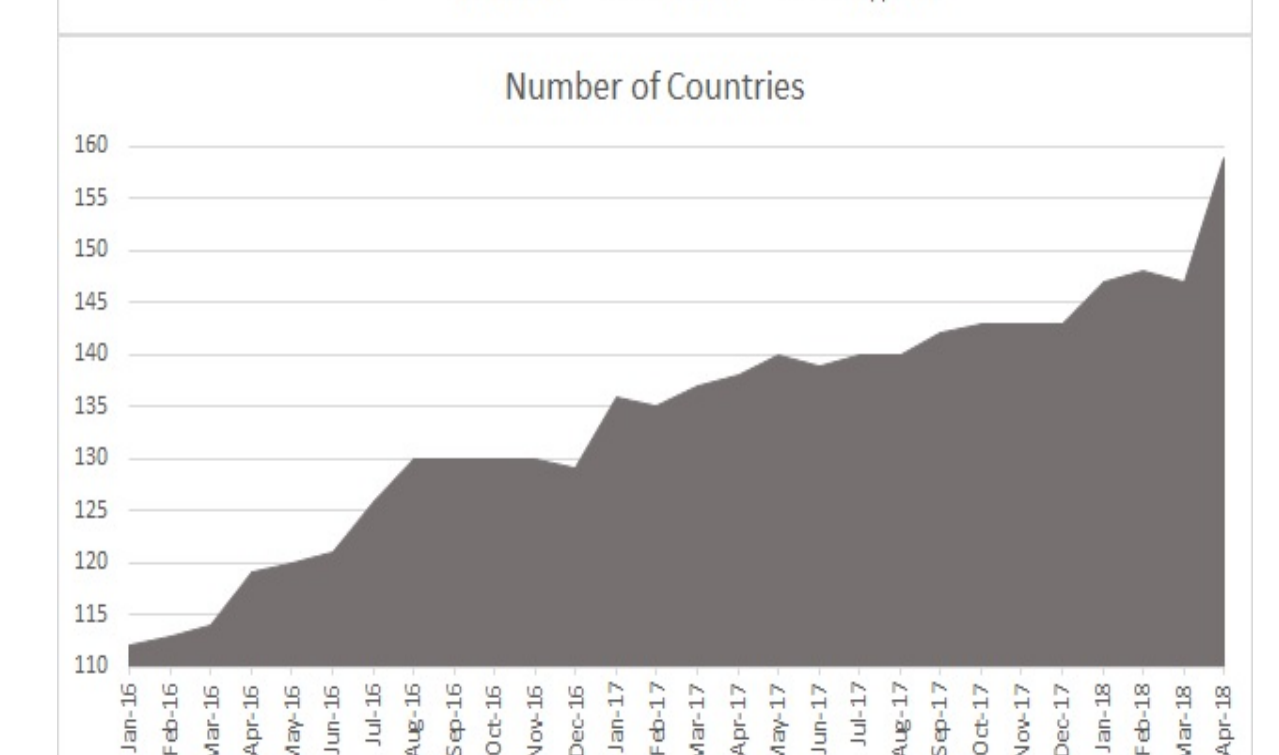
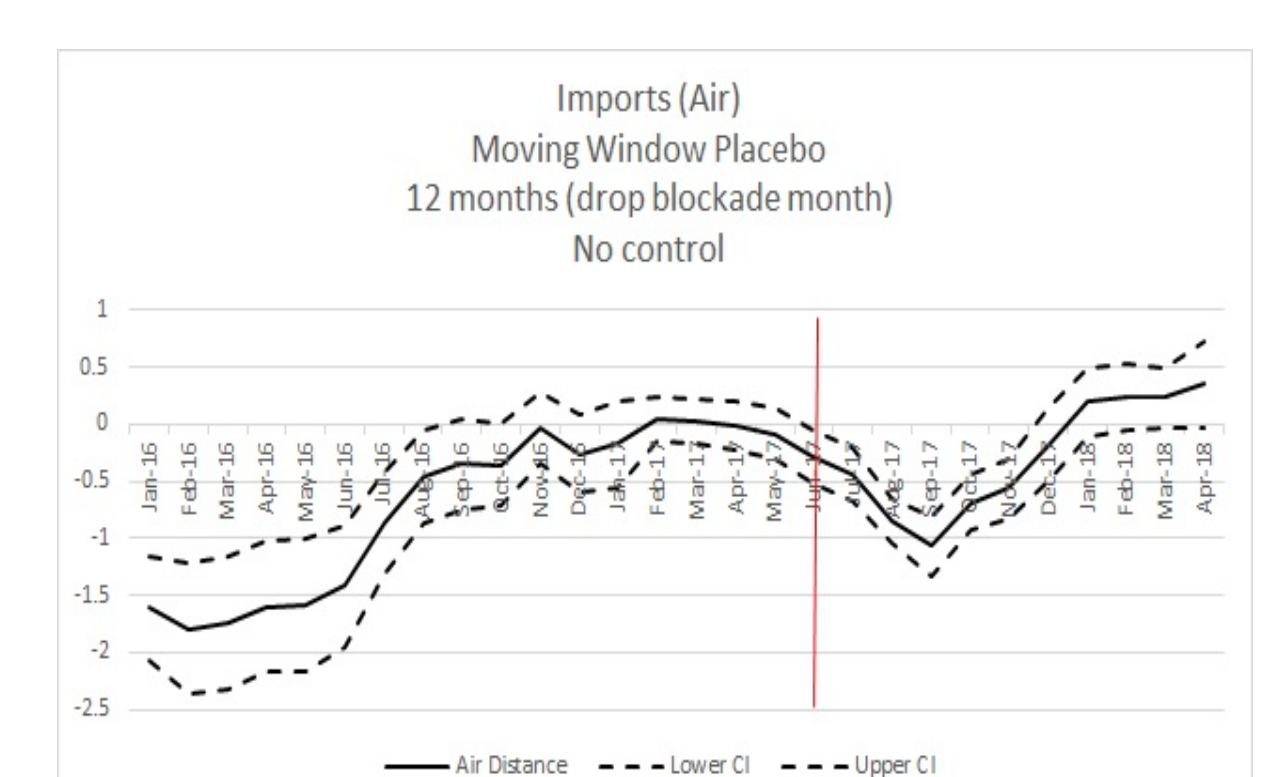
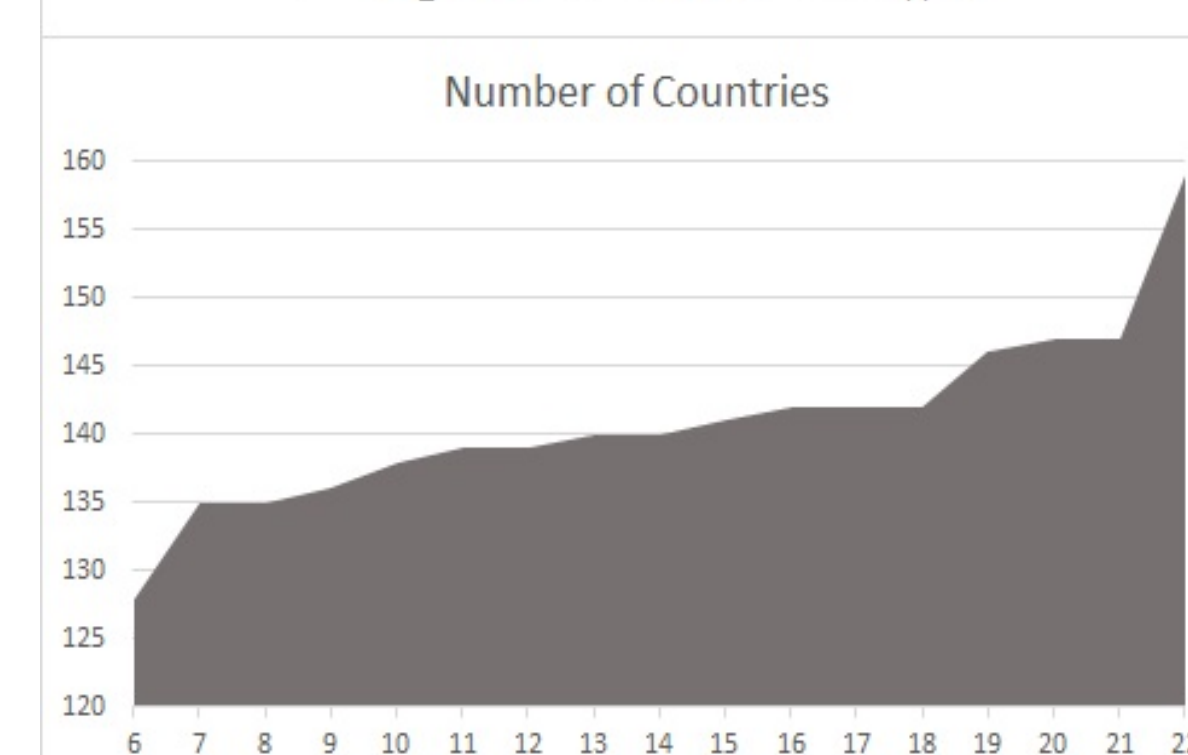
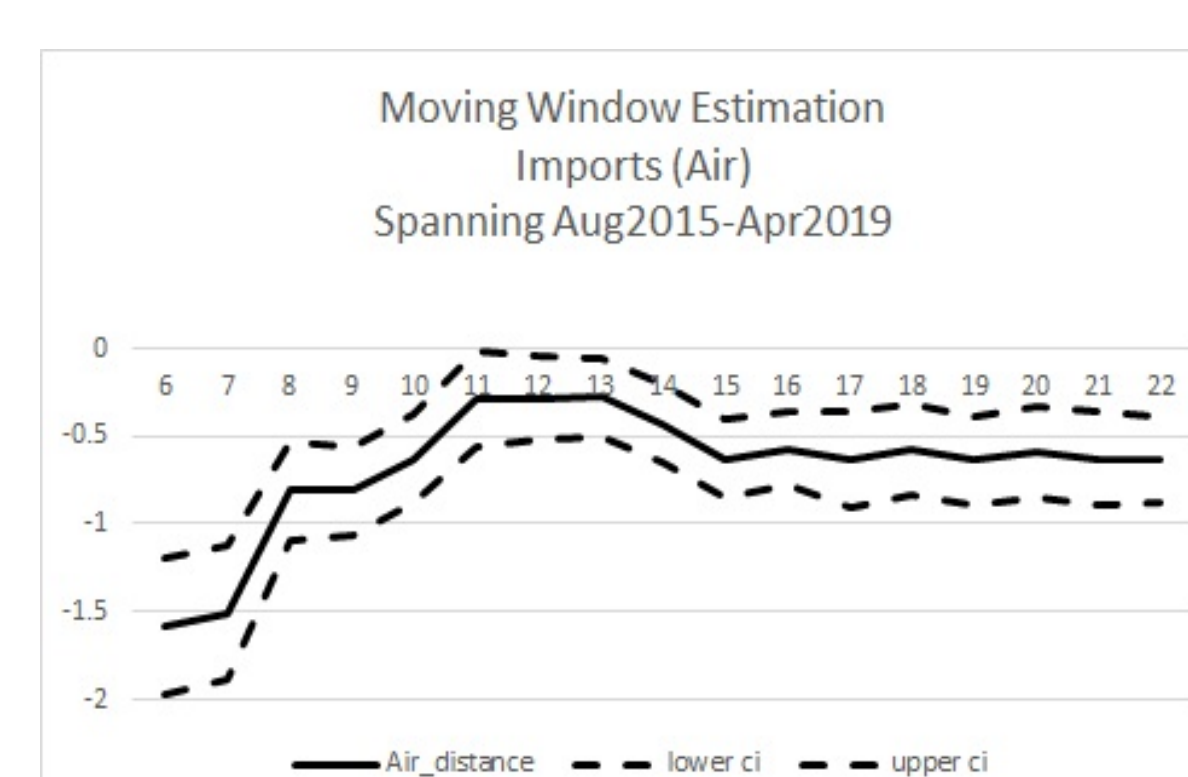
Estimation period: Jun2016-Jun2018, excluding June 2017 (aggregated at country-post)

VARIABLES	(1) Trade (Air)	(2) Trade (Air)	(3) Imports (Air)	(4) Imports (Air)
Air Distance (log)	-0.288** (0.119)	-0.502** (0.211)	-0.285** (0.120)	-0.502** (0.197)
Post	0.341*** (0.028)	0.245*** (0.060)	0.341*** (0.028)	0.244*** (0.053)
Pre-embargo sea share*Post		0.002 (0.002)		0.003 (0.002)
Pre-embargo land share*Post		0.001 (0.002)		0.003 (0.004)
Observations	292	292	278	278
Country FE	Yes	Yes	Yes	Yes
Pseudo R2	0.997	0.998	0.997	0.997

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

- We exclude June 2017 because it is a fuzzy period with adjustments, but results are robust to its inclusion.
- We observe a negative effect of distance on trade. A one percent increase in air distance leads to a decline of 0.3 in trade by air.
- Controlling for trade share by other modes, we observe a larger coefficient. This suggests substitution effect since embargo targeted other transportation modes.
- The results for imports by air in columns 3 and 4 are very similar. It is not surprising given that most exports are from the hydrocarbon sector.
- Post is always positive and statistically different from zero, so there is an increasing trend of trade.



- The first figure shows coefficient estimates using different aggregation periods from 6-22 months before and after the embargo. It shows that the effect of the embargo is persistent.
- To second figure tests that the embargo was not anticipated, we assume a fake blockade to have happened in different dates, starting Jan 2016 up to Apr 2018. And for each date, we run the same main equation. This figure plots the coefficient in the solid line. At the red line which is the actual blockade date, we see a clear drop and the coefficient is statistically significant from zero. Few months before the blockade, the effect is close to zero and non significant.