A Bipartite ERGM Approach to Studying Chinese Global Investment

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Motivation

In 2013, China launched an ambitious geo-strategic and economic initiative, called the Belt and Road Initiative (BRI). Involving over 60 participating countries and proclaiming to foster tighter economic cooperation, BRI has raised much skepticism. One the one hand, it is unclear whether China had the commitment and capacity to fulfil such a massive initiative. On the other hand, BRI might just be an extension of China's preexisting foreign investment policies wrapped in grand diplomatic rhetoric.

Did China substantially increase its foreign investments in the BRI-participating countries? What factors might explain its pattern of global investment?

Data and Method

This study relies on the *China Global Investment Tracker* dataset (American Enterprise Institute 2019), which records all majo Chinese foreign investment. Information, such as Chinese parent company, host country, and sector involved, is provided.

I focus on the period from 2013-2018, totaling 1,247 investments, 513 distinct Chinese parent firms, and 138 host countries. I employ an ERGM with terms amenable to bipartite network data.

Network Visualization
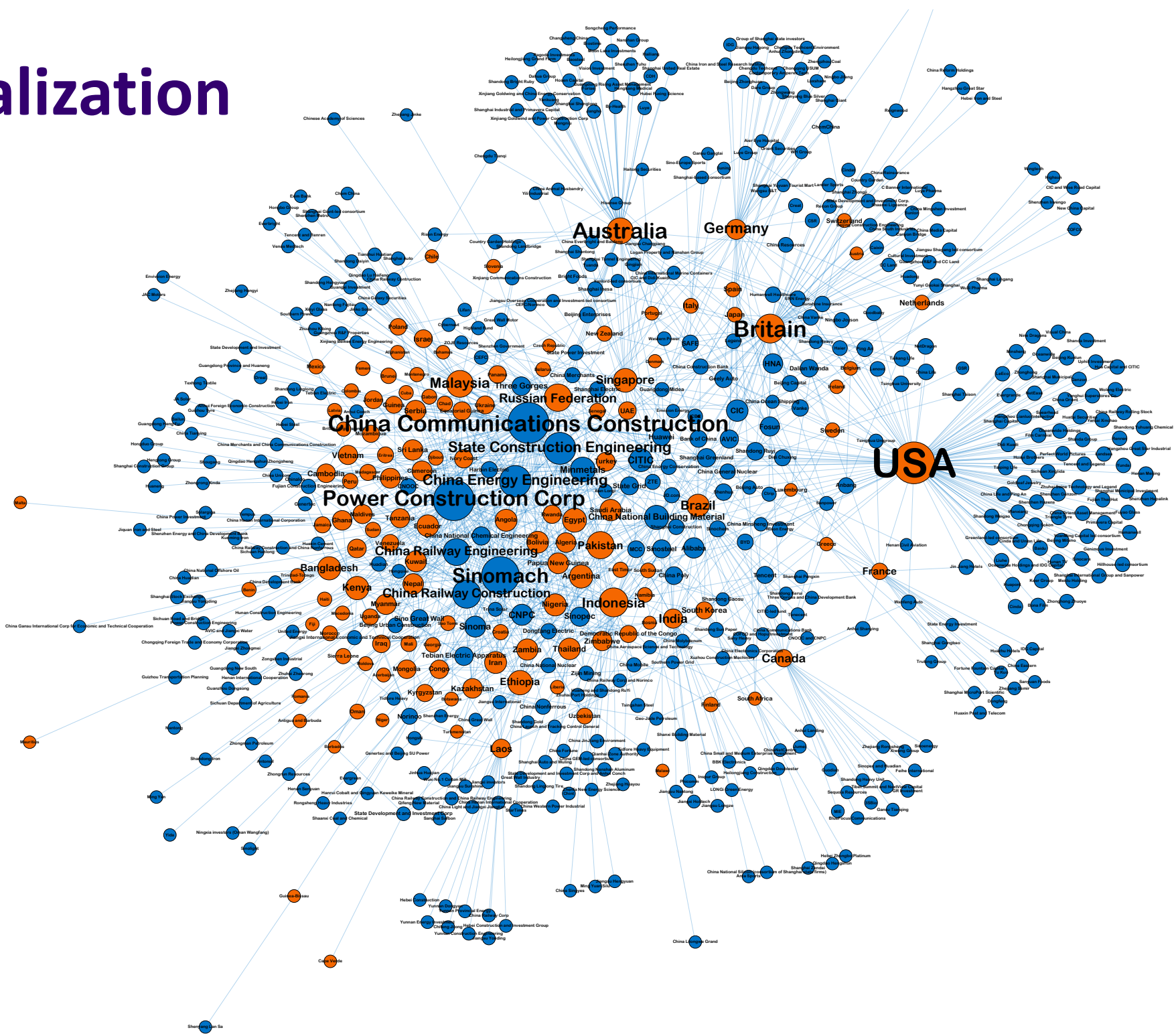
Model Results

Due to the limit of data, I include in the model three types of covariates only:
- Geometrically-Weighted degree estimates for Chinese parent firms
- Whether the host country is a participant of the BRI
- Which region the host country belongs to

The model results suggest that whether the host country is a BRI participant contributes to the formation of an investment tie. The estimate is even more positive after we account for the region of the host country.

	Dependent variable:		
	(1)	(2)	(3)
Edges	−3.306***	−3.393***	−3.757***
	(0.038)	(0.055)	(0.093)
GWDegree (Chinese firms)	−1.283***	−1.281***	−1.335***
	(0.116)	(0.114)	(0.110)
Participant of BRI (Foreign countries)		0.130**	0.465***
		(0.055)	(0.066)
Arab Middle East and North Africa			−0.666***
			(0.135)
Australia			2.141***
			(0.183)
Europe			−0.350***
			(0.094)
North America			−0.813***
			(0.169)
South America			−0.021
			(0.135)
Sub-Saharan Africa			0.551***
			(0.078)
USA			2.961***
			(0.145)
West Asia			−0.076
			(0.102)
Akaike Inf. Crit.	16,307.150	16,300.510	15,512.000
Bayesian Inf. Crit.	16,325.480	16,328.010	15,612.840

*p<0.1; **p<0.05; ***p<0.01

Table 1: ERGM Results

Conclusion and Extension

This study is a very preliminary attempt to study China's global investment patterns using ERGM suited to bipartite network data. Multiple extensions are possible. First, while this study aggregates temporally several years of investment data, it is possible to employ a temporal ERGM model to unpack the temporal dynamics of BRI. Further, with the collection of more data, it will be interesting to inquire the interaction of nodal attributes: do Chinese firms from a particular sector invest in foreign projects only within the same sectoral realm? Or do they adopt a more aggressive, diversified investment portfolio? Are state-owned firms more active in BRI? ERGM provides a promising approach to answer these questions in future.
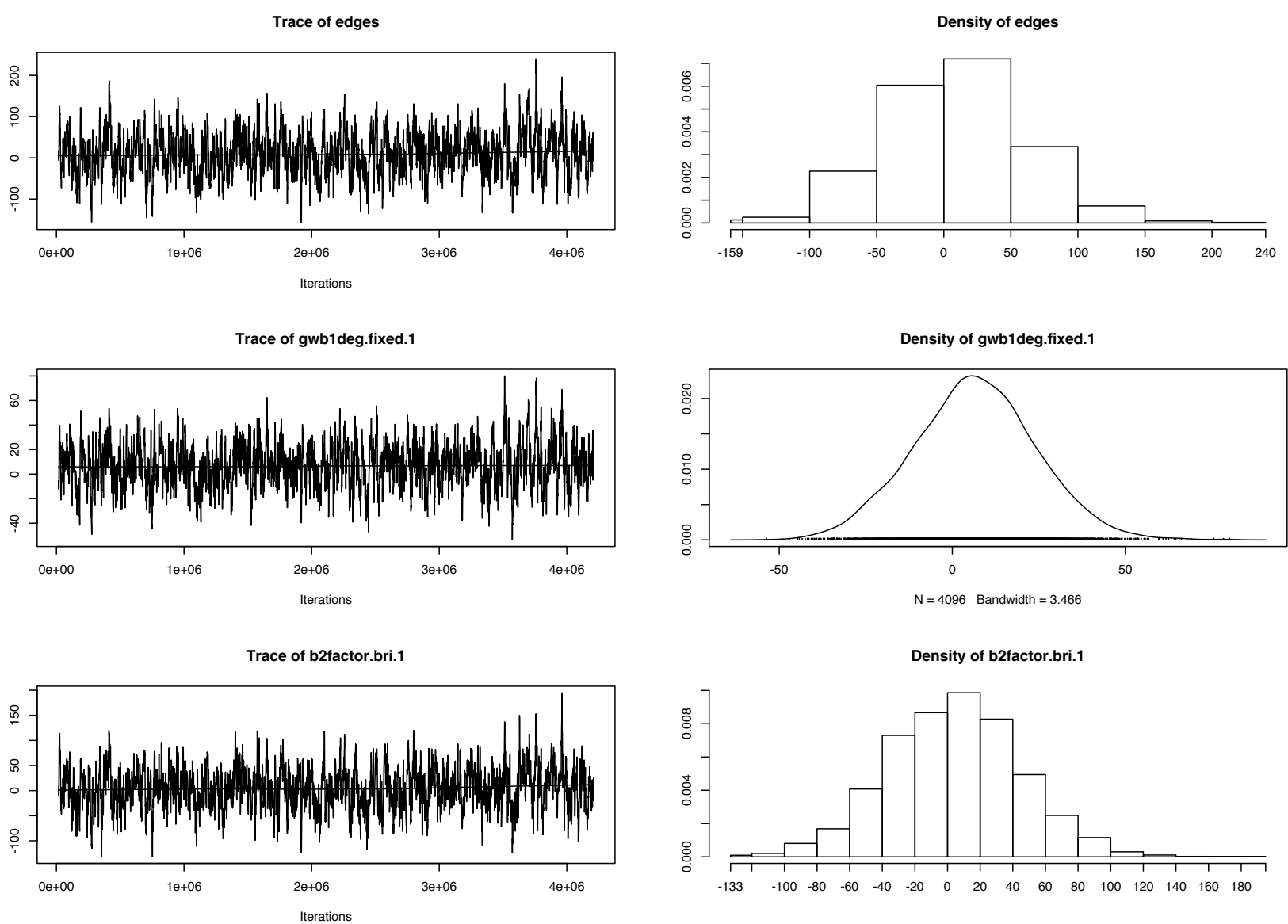
Appendix

Figure 2: Diagnostic Plots