A Latent Space Approach to Understanding Elite Coappearances in China

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Motivation

Understanding elite networks and relationships is valuable:

- How they change over time.
- Relationship to political outcomes.

Motivation

Elite politics in autocracies is:

- More important.
- More opaque.

We have limited information about elite relationships, but we have some information, notably for this paper we often have data on elites' public appearances.

Our Goal

Leverage patterns of public appearances through a latent factor network to estimate factions in the Chinese Communist Party.
Evaluation Criterion:

1. Face validity: Relationships uncovered make sense to those with subject matter expertise.
2. Predictive power: Use of our estimates improves performance of a downstream model of appointment to a key policymaking body.

Assumptions

- Public events are strategic foci around which elites signal and manage their relationships.
- These events reveal both relative prominence/position and relationships.
- These events can best be conceived as relational data.

Three "Who" Questions

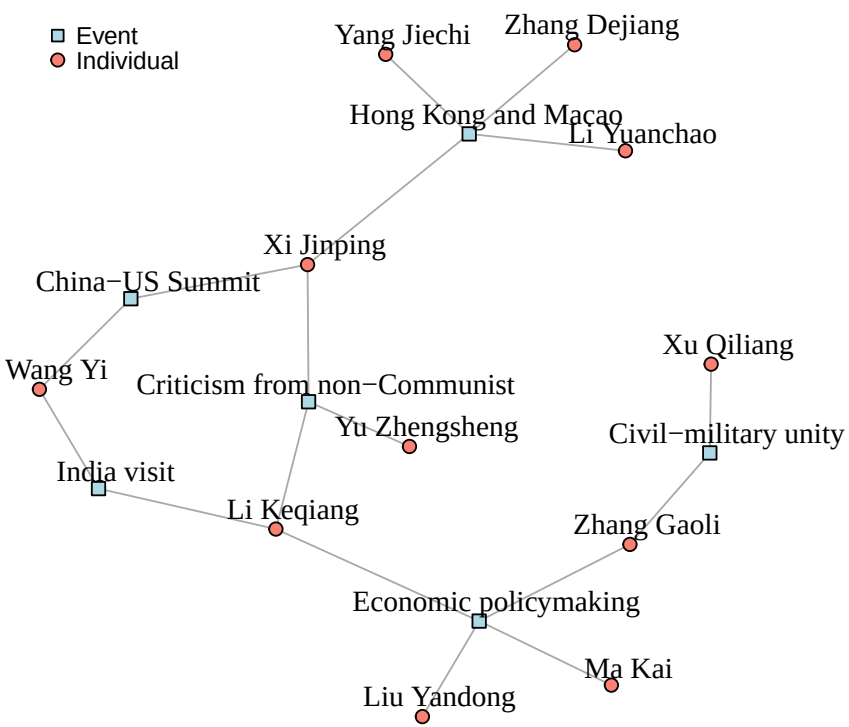
- "Who is in charge" – 1st order dependencies, which individuals have the most connections.
- "Who do I work with" – direct dyadic links between actors who go to the same events
- "Who are my friends" – proximity in an unobserved latent space based on both direct links and 3rd order dependencies.

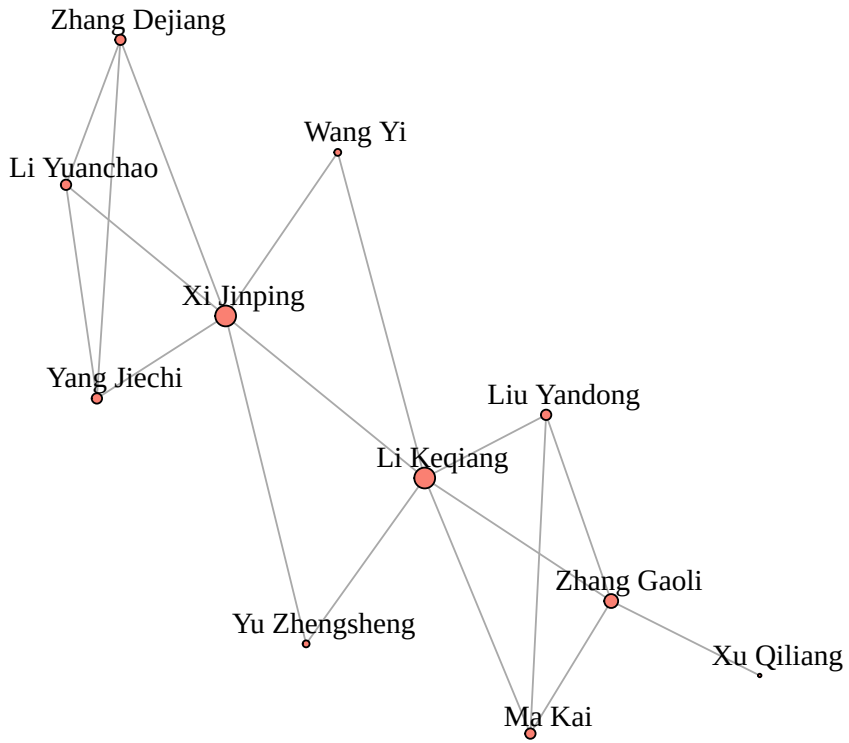
Data

- China Vitae Project
- Jan 1 2013 - Jan 1 2017
- 10,000 Appearances for 200 elites.
- Protocols are “by-rank-only” and “by-invitation-only”, we focus on the latter.

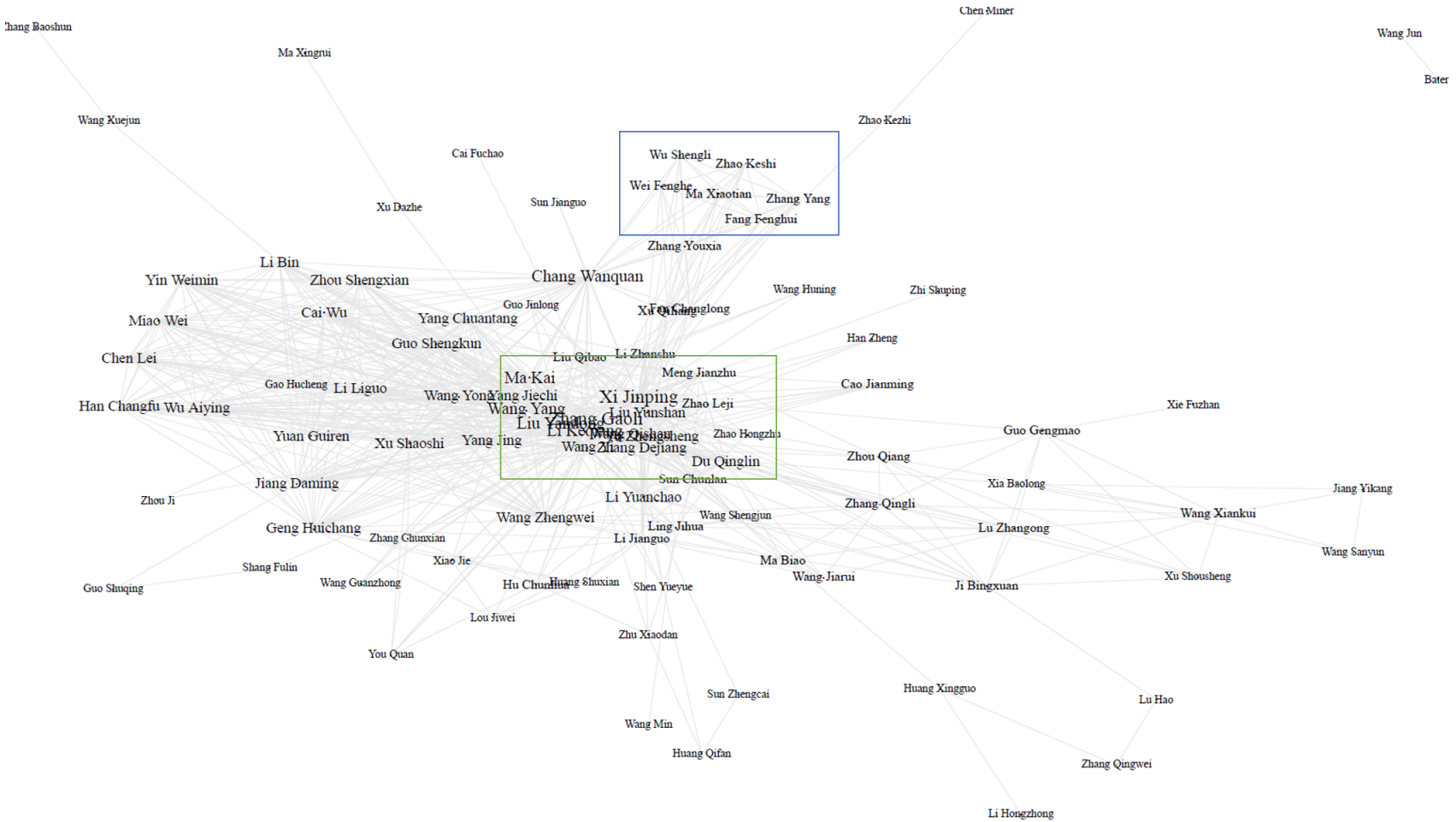
Data as a Network

Network is two-mode, we transform it to a one mode coappearance network.





The Full Coappearance Network (i.e., ugly spaghetti plot)



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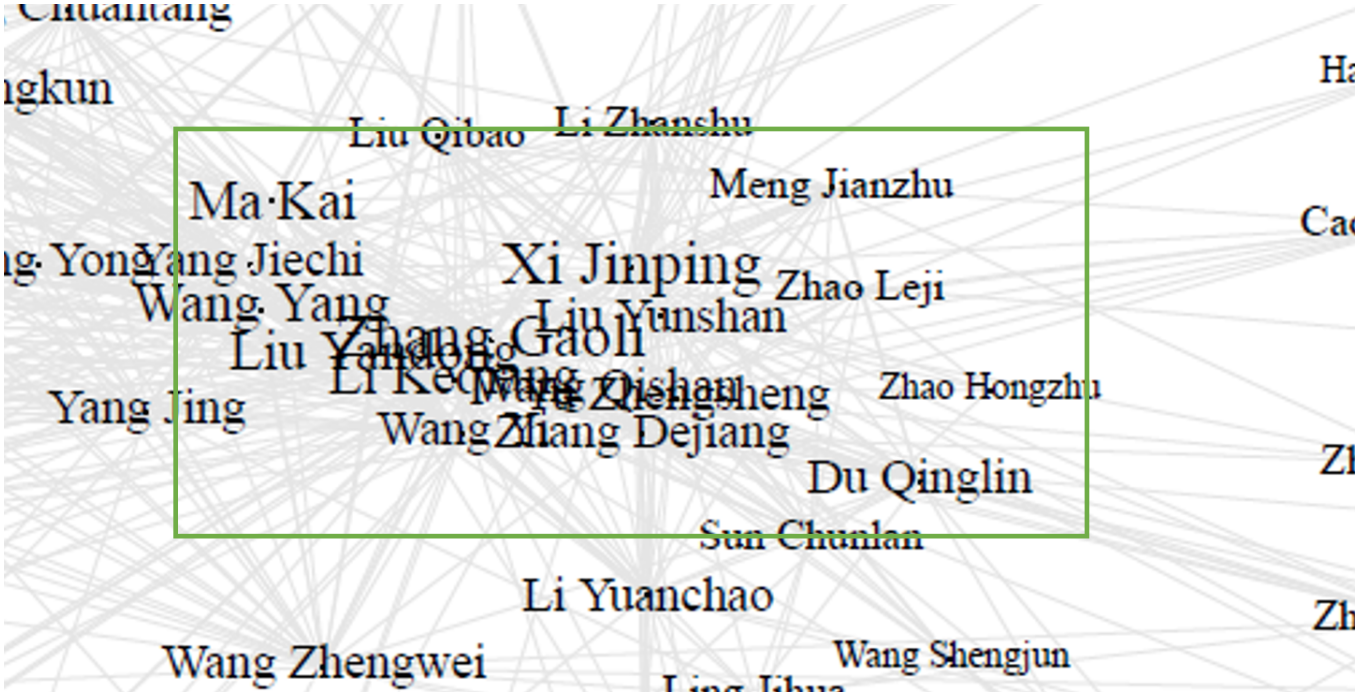

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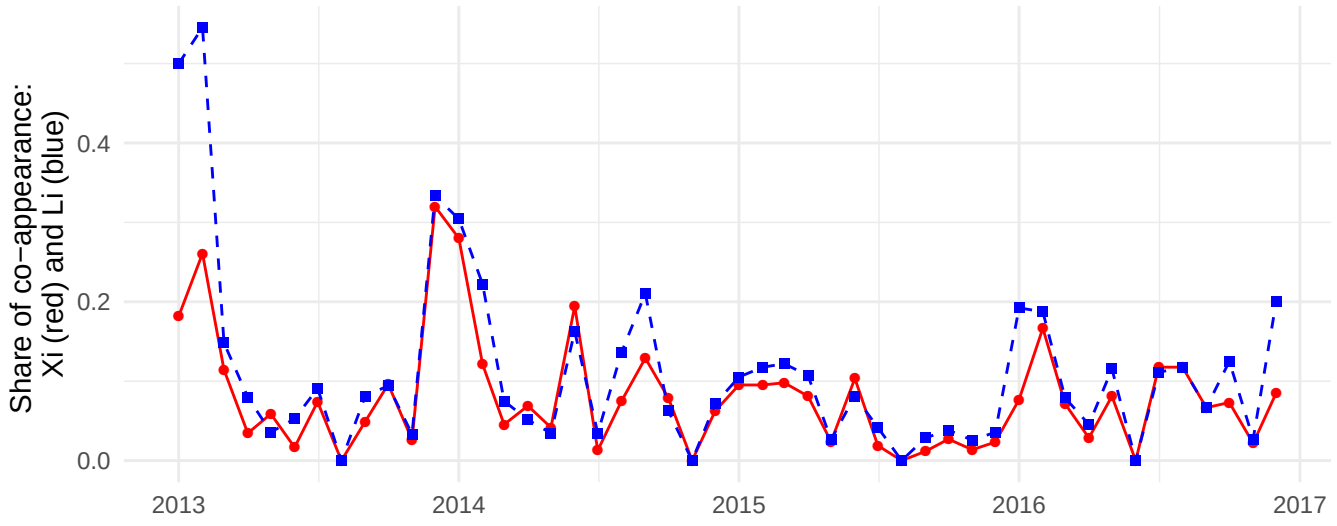
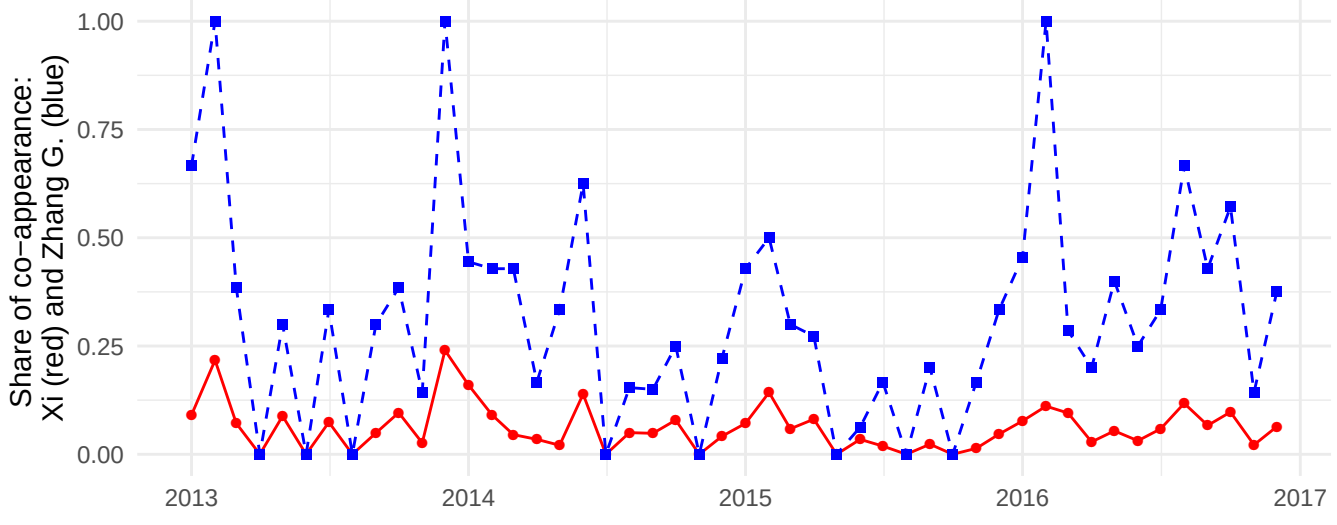
Activity


Share of co−appearance:
Xi (red) and Li (blue)
0.0
0.2
0.4
2013
2014
2015
2016
2017


Share of co−appearance:
Xi (red) and Zhang G. (blue)
0.00
0.25
0.50
0.75
1.00
2013
2014
2015
2016
2017

Methodology

- Use Latent Factor Model (Hoff 2008, Minhas et al 2019, Hoff 2021) to account for 1st/2nd/3rd order dependenices.

$$Y = f(\theta) \tag{1}$$
$$\theta = \beta^\top \mathbf{X} + Z \tag{2}$$
$$Z = M + E \tag{3}$$
$$M = U \Lambda U^\top \tag{4}$$

- Null model, no covariates, no actor random effects, we just want to get out the multiplicative effect to figure out 3rd order dependencies.

Methodology

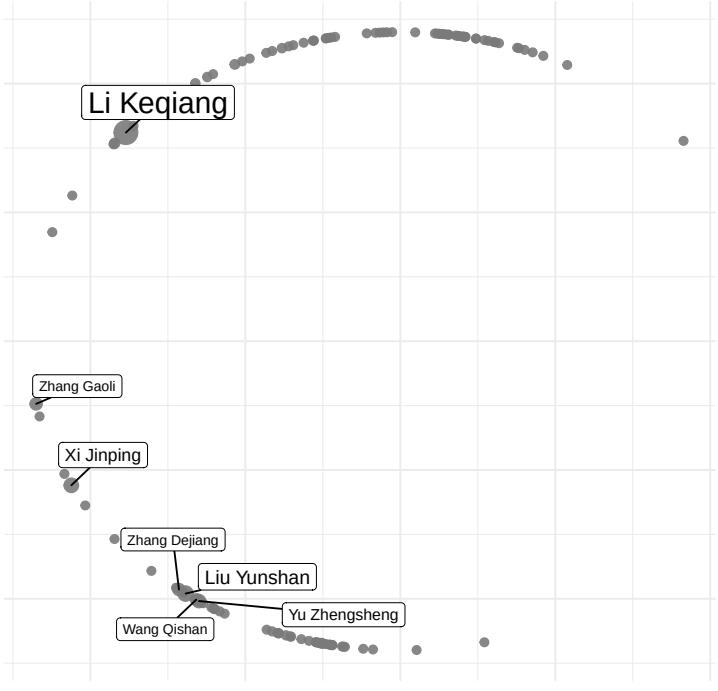
Interpreting the U^T matrix

- U is an *nxk* matrix that embeds actors in a k dimensional vector space. (k = 2)
- Actors with vectors pointing in similar directions are likely to share third order ties.
- For example – consider an elite and his protege's protege. These actors will often have few coappearances but have very strong 3rd order ties.
- To measure this similarity we generate a measure of cosine similarity which we term "latent angle distance".

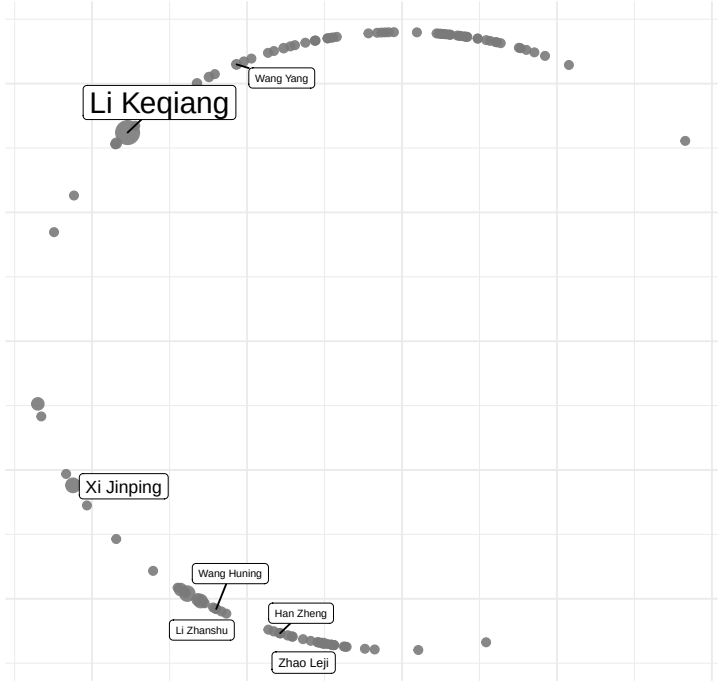
Latent Positions

The positions of actors in the U space estimated from the null latent factor model projected onto a unit circle

Politburo Standing Committee: 18th Central Committee



Politburo Standing Committee: 19th Central Committee



Downstream Model

- Trying to predict appointment to the Leading Small Group.
- More informal and individual driven policy making committees
- Two types of LSG: Central Committee and State Council, with appointment controlled by the chairman (Xi) and the premiere (Li Keqiang) respectively
- We use appointment to the LSG as our DV of a Negative Binomial Model, with the following covariates
  1. Total appearances at events
  2. Direct coappearances with Xi Jinping (or Li)
  3. Latent angle measure of similarity to Xi (Li)

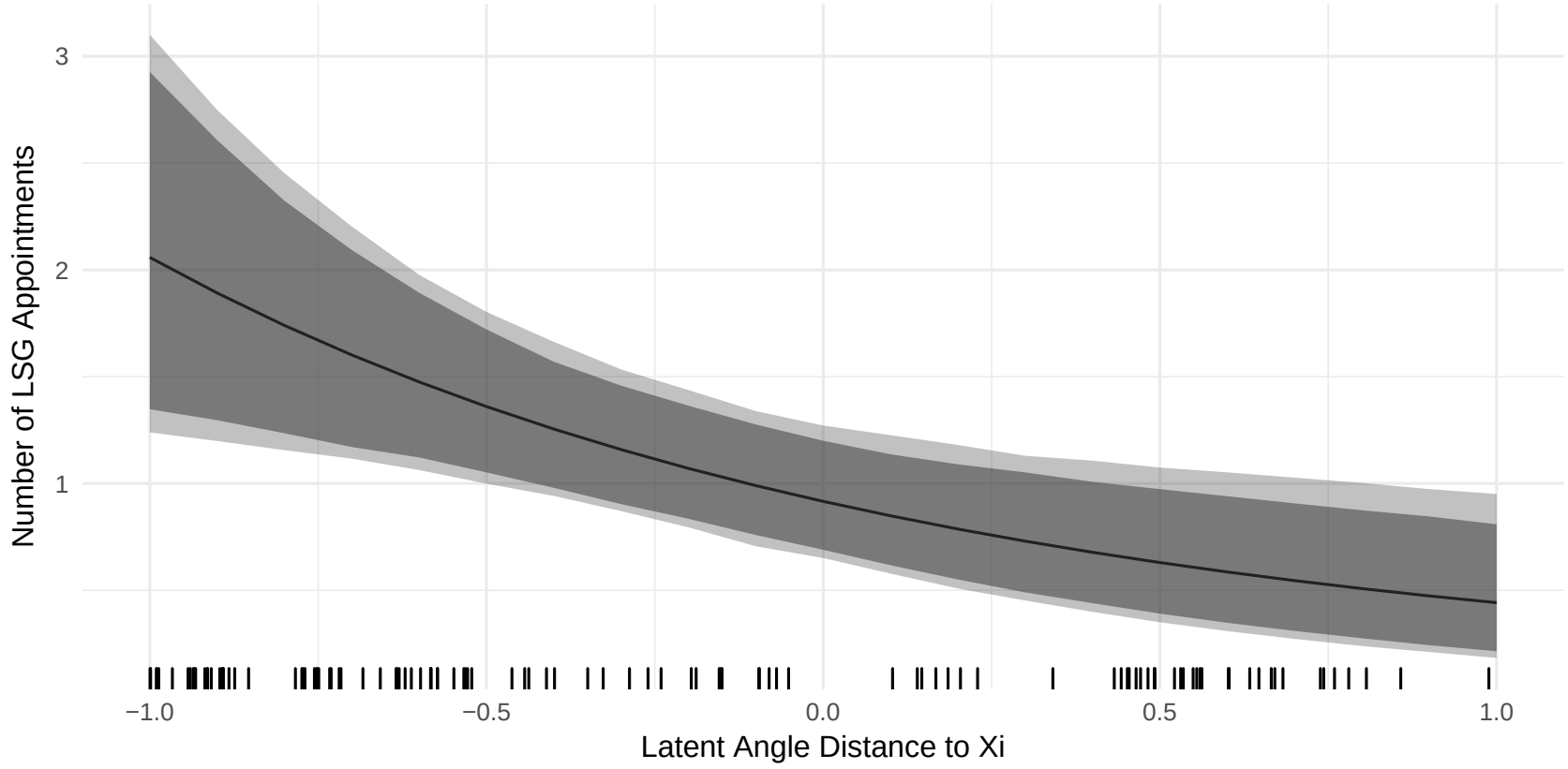
Negative binomial regressions on appointment to LSGs

	Total Appearances	Total Appearances & Coappearances	Total Appearances & Latent Distance
(Intercept)	−0.02	−0.07	−0.23
	(0.16)	(0.17)	(0.18)
Total Appearances	0.01***	0.02*	0.01**
	(0.00)	(0.01)	(0.00)
Coappearances with Xi		−0.08	
		(0.07)	
Latent Distance from Xi			−0.80***
			(0.28)

Note: * significant at $p < .10$; ** $p < .05$; *** $p < .01$

Impact of Similarity to Xi

Substantive effect of our latent distance from Xi variable on predicted number of Leading Small Group (LSG) appointments



Out of Sample Model Performance

Model	Logarithmic	Brier	Spherical	RMSE
Total Appearance	1.77	-0.36	-0.64	1.89
Total and Coappearance	1.77	-0.38	-0.66	1.84
Total Appearance and Latent Distance to Xi	1.73	-0.46	-0.86	1.74

Bivariate probit analyses of CC and SC LSGs

	Latent Distance to Xi		Latent Distance to Li	
	CC	SC	CC	SC
Total appearances	0.05^{***}	-0.00	0.06^{***}	-0.00
	(0.02)	(0.00)	(0.02)	(0.00)
Latent distance to Xi	-0.62^{**}	-0.26		
	(0.29)	(0.23)		
Latent distance to Li			-0.34	-1.86^{***}
			(0.36)	(0.40)

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Conclusion

- Latent factor approach and public events can give us leverage on opaque, informal behaviour in autocratic states.
- Potential new source of data (appearances) for the study of authoritarian politics.
- Network based approach trounces dyadic measures on this data.
- Measure not only predicts a novel empirical fact (appointment to the LSG) but it discriminates between types of LSGs as institutional power would predict.
- Evidence of Xi Jinping's growing informal power between 2013-2017

Future Steps

- Figure out who is important/powerful endogeneously.
- Larger timespan and time varying network.
- Connect factions/latent connections/LSG membership to policy outcomes.

Thanks for your time! Questions?