## Energy Consumption Growth and Industrial Network in China

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#### 2 Industrial Network

#### Estimation 3





#### **(5)** Conclusion and Future Work

#### 1 Motivation

#### 2 Industrial Network

#### 3 Estimation





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### Motivation



## Motivation (Cont.)



#### 1 Motivation

#### 2 Industrial Network

#### 3 Estimation





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### IO-matrices by province



Beijing (Year = 2002)



Heilongjiang (Year = 2002)

### Eigenvector Centrality by Province



Beijing (Year = 2002)

Heilongjiang (Year = 2002)

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### Energy Demand and GDP



Beijing - Cement production

Beijing - Metal production

### Energy Demand and GDP



Heilongjiang - Cement production

Heilongjiang - Metal production



#### 2 Industrial Network







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#### ARIMA with Heterogeneous Parameters

$$E_{it} = \eta_i + \alpha_{0i} E_{i,t-1} + \alpha_{1i} price_{it} + \alpha_{2i} ln Y_{it} + \sum_{j=1}^{N(i)} \beta_{ji} ln Z_{it} + \Gamma_i \mathbf{Control}_{it} + u_{it}$$

in which:

$$X_{it} = a_{2i} + \lambda_i f_t + \gamma_i g_t + e_{it}$$
$$u_{it} = a_{1i} + \lambda_i f_t + \varepsilon_{it}$$

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## Estimation Results (Partial)

VARIABLES	Baseline	FGLS	Baseline	AMG
Energy lag				-0.0286
				(-0.0391)
GDP	$1.046^{***}$	$0.667^{***}$	0.820***	$0.738^{***}$
	(0.074)	(-0.0743)	(0.175)	(-0.144)
Price	-0.080	-0.165**	-0.0331	0.0247
	(0.080)	(-0.0738)	(0.0936)	(-0.0397)
HEI	No	Yes	No	Yes
Year dummy (trend)	Yes	Yes	Yes	Yes
Observations	551	538	538	499
Group	29	29	29	28
MSE			0.0496	0.0066

#### Goodness of fit



Beijing

Heilongjiang

## Average Eigenvector Centrality



Average Eigenvetor Centralities of HEI Industries

Eigenvector Centrality and Energy Income Elasticity

## Energy Kuznets Curve



#### Energy Kuznets Curve

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## Industrial upgrade in China



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	No change	Moderate	Rapid
GDP	0.82	0.6570	0.4100
Price	-0.0331	-0.1064	1.4252
Energy lag	0.00584	0.0275	-0.0052
$\operatorname{constant}$	1.373	0.9610	-6.1394

#### Forecasts



#### Forecasts for three scenario

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## Comparison







#### **(5)** Conclusion and Future Work

- Economic structure is very essential in energy consumption forecasts
- With rapid economic structure updates in the next 10 years, the energy consumption in China will be around 5.7 billion tce in 2022, around 30% lower than the "no change" case.

#### Conclusion

# Thank you!

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