Does a democratic government attract more FDI?

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Research questions

- **Does democracy affect FDI inflow positively?**
- How to get a continuous measurement of democracy?
- Which is the best machine learning method to predict FDI?

Introduction

- Significance of the relationship between democracy and FDI for developing countries
- Theoretically, the relationship is unclear
  - Positive: property rights protection
  - Negative: monopolistic or oligopolistic position
- Empirically, different estimation results
  - Positive: Guerin and Manzocchi (2009),
  - Negative: Li and Resnick (2003)
  - No significant result: Kazemi and Azman-Saini (2017)
  - Natural resource: Asiedu and Lien (2011)
  - Corruption: Mathur and Singh (2013)
- Explanation: the estimation strategy of calculating democracy index is problematic

Limitations of existing democracy index

- Failed to include some important instruments
- Problems with the aggregation process
- The final indicators are not continuous

Using SVM to recalculate democracy

The democratization index of country i in period t could be expressed as a function of the extent to which the country-year satisfies the selected m conditions, i.e.

$$D_{it} = F(x_{it}^1, x_{it}^2, \dots x_{it}^m)$$

The algorithm is as follows:

- Select the feature variables for measurement
- Construct a sample data set by selecting the country-year pairs which could be definitely categorized as either democracy or autocracy
- Randomly select country-year pairs in the sample data set and create training set
- Use the kernel trick to estimate the function F
- Assign the estimated function F to calculate democracy indicator to all of the pairs

Estimated democracy indicators in the world
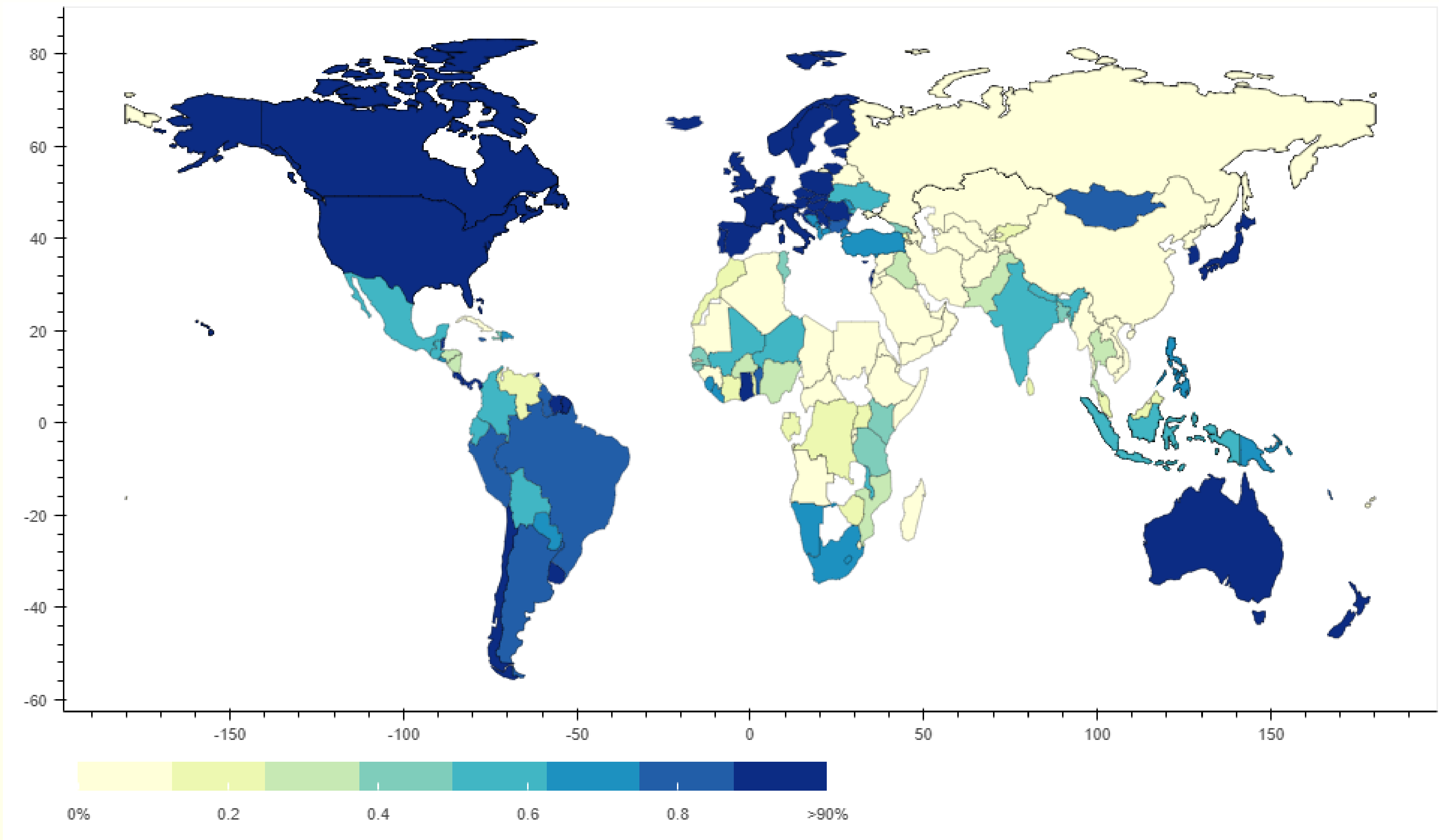
Model specification

- A linear dynamic panel data (DPD) model is employed.
- Arellano and Bond (1991) proposed "difference GMM" estimator for DPD models.
- The bench model is as follows:

$$\mathrm{y}_{it} = \rho\, y_{it-1} + \lambda D_{it} + \beta X_{it} + \theta_i + \varepsilon_{it}$$

where y_{it} is the log of net FDI inflow in country i at 5-year period t, D_{it} is democracy index, X_{it} includes all the covariates of the regression.

Summary statistics

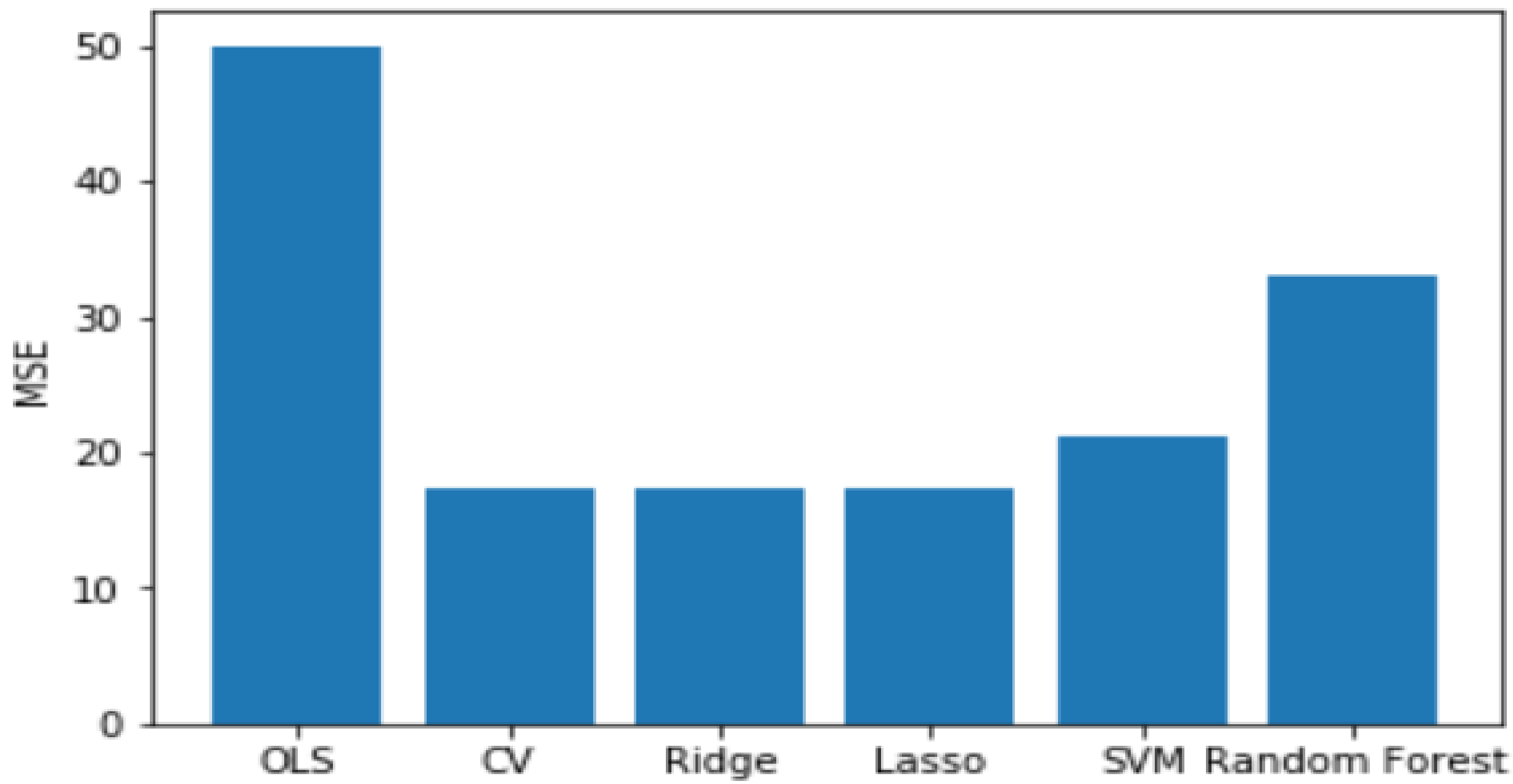|	count	mean	std	min	25%	50%	75%	max
FDI	4381	3.78	12.75	-58.32	0.46	1.69	4.30	451.72
DEMOCRACY	4850	0.48	0.39	0.01	0.06	0.47	0.92	0.98
IMPORTS	4291	41.98	24.89	0.00	25.75	36.44	53.55	236.39
EXPORTS	4291	36.26	25.25	0.01	20.19	30.72	46.64	231.19
INFLATION	4032	38.46	473.33	-17.64	2.49	5.72	11.73	23773.13
FIXED CAPITAL	3960	21.75	7.55	-2.42	17.38	21.30	25.30	89.39
FIXED TELEPHONE	4816	14.39	17.14	0.00	1.04	6.69	22.92	74.74
GDP PER CAPITA	4516	10284.54	15887.45	131.65	1030.25	3414.88	11095.57	111968.35
FUEL EXPORTS	3331	16.79	27.94	0.00	0.51	3.47	15.59	99.96
ORES AND METALS EXPORTS	3452	7.53	13.74	0.00	0.54	2.31	6.39	84.19

Note: Apart from democracy, all the other variables come from World Development Indicators. FDI is the net inflows as share of GDP. Imports and exports are imports and exports of goods and services percent of GDP respectively. Inflation is the annual inflation rate. Fixed capital is the share of gross fixed capital formation in GDP Fixed telephone is the number of telephones per 100 people. GDP per capita is in constant 2010 US dollar. Fuel exports is the share of fuel in total merchandize exports, and ores and metals exports is the share of ore and metal in total merchandize exports.

Comparison of different FDI prediction models

Conclusion

- Democracy level of a country has a robustly positive effect on FDI.
- Natural resources do not undermine the effect of democracy on FDI.
- Among the six methods I used, the best machine learning approach to predict FDI is Lasso regression combined with cross validation.

References

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The effect of Democracy on FDI

Dependent variable: FDI/GDP	(1)	(2)	(3)	(4)
LAGGED FDI/GDP	0.544***	0.546***	0.545***	0.544***
	(0.000)	(0.000)	(0.000)	(0.000)
DEMOCRACY	0.649***	1.053**	0.567***	0.596***
	(0.004)	(0.021)	(0.003)	(0.000)
NATURAL RESOURCES	0.764	0.103***		
	(0.457)	(0.002)		
NAT×DEM		-0.071		
		(0.204)		
FUEL EXPORTS			0.029	
			(0.658)	
ORES AND METALS EXPORTS				0.146
				(0.204)
Number of Countries	131	131	133	131
Sargan test(p-value)	0.204	0.190	0.195	0.191
Serial correlation test(p-value)	0.151	0.132	0.159	0.148

Note: p-value in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Limitations

- Endogeneity problem cannot be fully solved.
- Did not build clusters before using different estimation strategies.

Acknowledgements

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