

Foreign Direct Investment

Hypothesis

- Democratic countries will be able to attract more foreign direct investment than authoritarian countries

Data organization: Panel data

	country	period	logfdiperc~a	polity020
1	Afghanistan	1	-1.599735	.
2	Afghanistan	2	-3.800138	2
3	Afghanistan	3	.	8.4
4	Afghanistan	4	-3.150371	3
5	Afghanistan	5	1.354968	.
6	Afghanistan	6	1.610148	.
7	Albania	1	.	1
8	Albania	2	.	3
9	Albania	3	2.757819	14.2
10	Albania	4	3.168742	14
11	Albania	5	4.279779	17
12	Albania	6	5.676426	19
13	Algeria	1	1.019108	1
14	Algeria	2	-1.246655	3.8
15	Algeria	3	-.236707	4.8
16	Algeria	4	2.443635	7
17	Algeria	5	3.413519	9
18	Algeria	6	4.219492	12
19	Angola	1	2.536804	3
20	Angola	2	2.03896	3
21	Angola	3	3.518328	8.6

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The Model

$$Y_{i,t} = X_{i,t}\beta + u_i + \varepsilon_{i,t}$$

for $i = 1..162$ (countries)

$t = 1..6$ (periods)

[162 x 6 = 972 observations]

Issue 1: Specification

$$Y_{i,t} = X_{i,t}\beta + u_i + \varepsilon_{i,t}$$

- Dependent variable: $\log(\text{FDI/capita})$
- Independent variables:
 - $\log(\text{GNI/capita})$
 - GNI growth/capita
 - Nat. resources rents/gdp

Issue 1: Specification

$$Y_{i,t} = X_{i,t}\beta + u_i + \varepsilon_{i,t}$$

Solution: Fixed-effects regression using
areg or
xtreg commands in Stata

Issue 2: Standard errors

$$Y_{i,t} = X_{i,t}\beta + u_i + \varepsilon_{i,t}$$

Are the $\varepsilon_{i,t}$'s independently and identically distributed (i.i.d.)?

Issue 2: Standard errors

$$Y_{i,t} = X_{i,t}\beta + u_i + \varepsilon_{i,t}$$

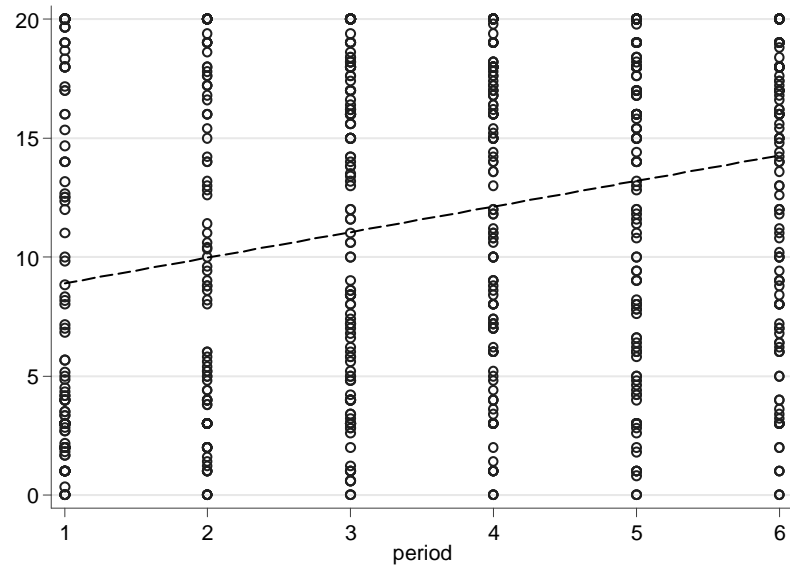
Solution: use the “cluster” command in the regression

Issue 3: Spurious time effects

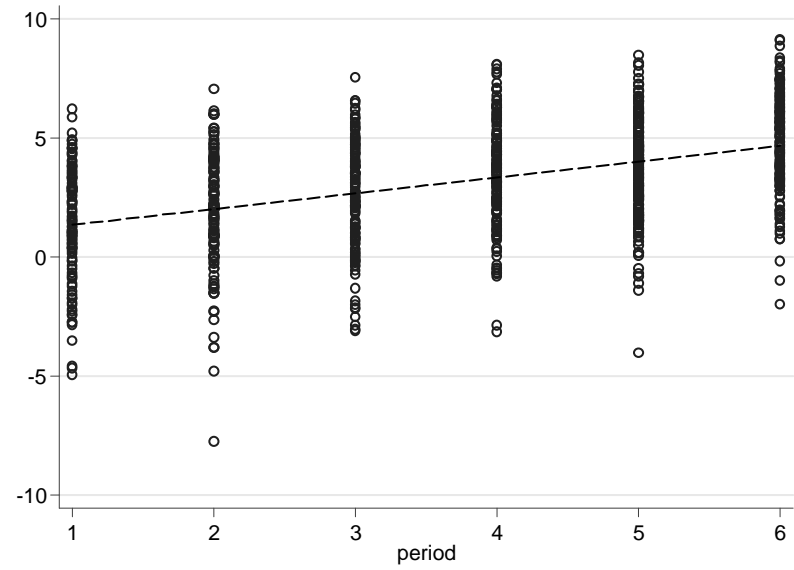
$$Y_{i,t} = X_{i,t}\beta + u_i + \varepsilon_{i,t}$$

- Inflation?
- Correlation between $\varepsilon_{i,t}$ and $X_{i,t}$
 - Remember the correlation between radio usage and “mental defectives” in Britain

Polity vs. period (r = .26)



log(FDI/capita) vs. period (r = .44)



Issue 3: Spurious time effects

$$Y_{i,t} = X_{i,t}\beta + u_i + \varepsilon_{i,t}$$

- Solutions:
 - Convert everything to first differences
 - Deflate
 - Include a period dummy variable

Solution 1: Fixed-effects regression

```
. areg logfdipercapita polity loggnipercapita gnipercapitagrowth  
rentspercentgdp,a(country)
```

Linear regression, absorbing indicators

```
Number of obs   =          670  
F(    4,    524) =        218.08  
Prob > F        =          0.0000  
R-squared       =          0.8866  
Adj R-squared   =          0.8552  
Root MSE       =          0.8751
```

logfdipercapita	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
polity020	.0358349	.0121865	2.94	0.003	.0118945	.0597753
loggnipercapita	2.312419	.0977039	23.67	0.000	2.12048	2.504359
gnipercapitagrowth	.068677	.0117277	5.86	0.000	.045638	.0917161
rentspercentgdp	.0147414	.0075275	1.96	0.051	-.0000463	.0295291
_cons	-16.43641	.7687221	-21.38	0.000	-17.94657	-14.92626
country	F(141, 524) =		6.003	0.000	(142 categories)	

	Original	w/Fixed effects
Polity	0.027 (0.010)	0.036 (0.012)
ln(GNI/capita)	1.36 (0.05)	2.31 (0.01)
GNI growth/capita	0.099 (0.013)	0.069 (0.012)
Nat. resource rents/GDP	0.010 (0.004)	0.015 (0.008)
Constant	-8.46 (0.33)	-16.44 (0.77)
N	670	670
s.e.r.	1.26	0.88
R ²	.70	.89

Solution 2: Clustered standard errors

```
. areg logfdipercapita polity loggnipercapita gnipercapitagrowth
rentspercentgdp,a(country) cluster(country)
```

Linear regression, absorbing indicators

```
Number of obs   =          670
F(    4,    141) =        105.18
Prob > F        =          0.0000
R-squared       =          0.8866
Adj R-squared   =          0.8552
Root MSE       =          0.8751
```

(Std. Err. adjusted for 142 clusters in country)

logfdipercapita	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
polity020	.0358349	.0214974	1.67	0.098	-.0066639	.0783337
loggnipercapita	2.312419	.1461625	15.82	0.000	2.023466	2.601372
gnipercapitagrowth	.068677	.0146433	4.69	0.000	.0397282	.0976258
rentspercentgdp	.0147414	.0123737	1.19	0.236	-.0097206	.0392034
_cons	-16.43641	1.09137	-15.06	0.000	-18.59398	-14.27885
country	absorbed		(142 categories)			

	Original	w/Fixed effects	w/f.e. & clustered s.e.
Polity	0.027 (0.010)	0.036 (0.012)	0.036 (0.021)
ln(GNI/capita)	1.36 (0.05)	2.31 (0.01)	2.31 (0.15)
GNI growth/capita	0.099 (0.013)	0.069 (0.012)	0.069 (0.015)
Nat. resource rents/GDP	0.010 (0.004)	0.015 (0.008)	0.015 (0.012)
Constant	-8.46 (0.33)	-16.44 (0.77)	-16.44 (1.09)
N	670	670	670
s.e.r.	1.26	0.88	0.88
R ²	.70	.89	.89

Solution 3.3: Period dummy variables

```
. tab period,gen(_p)
```

period	Freq.	Percent	Cum.
1	162	16.67	16.67
2	162	16.67	33.33
3	162	16.67	50.00
4	162	16.67	66.67
5	162	16.67	83.33
6	162	16.67	100.00
Total	972	100.00	

```
. d _p*
```

variable name	storage type	display format	value label	variable label
_p1	byte	%8.0g		period== 1.0000
_p2	byte	%8.0g		period== 2.0000
_p3	byte	%8.0g		period== 3.0000
_p4	byte	%8.0g		period== 4.0000
_p5	byte	%8.0g		period== 5.0000
_p6	byte	%8.0g		period== 6.0000

Solution 3.3: Period dummy variables

```
. areg logfdipercapita polity loggnipercapita gnipercapitagrowth rentspercentgdp
_p2-_p6,a(country) cluster(country)
```

Linear regression, absorbing indicators

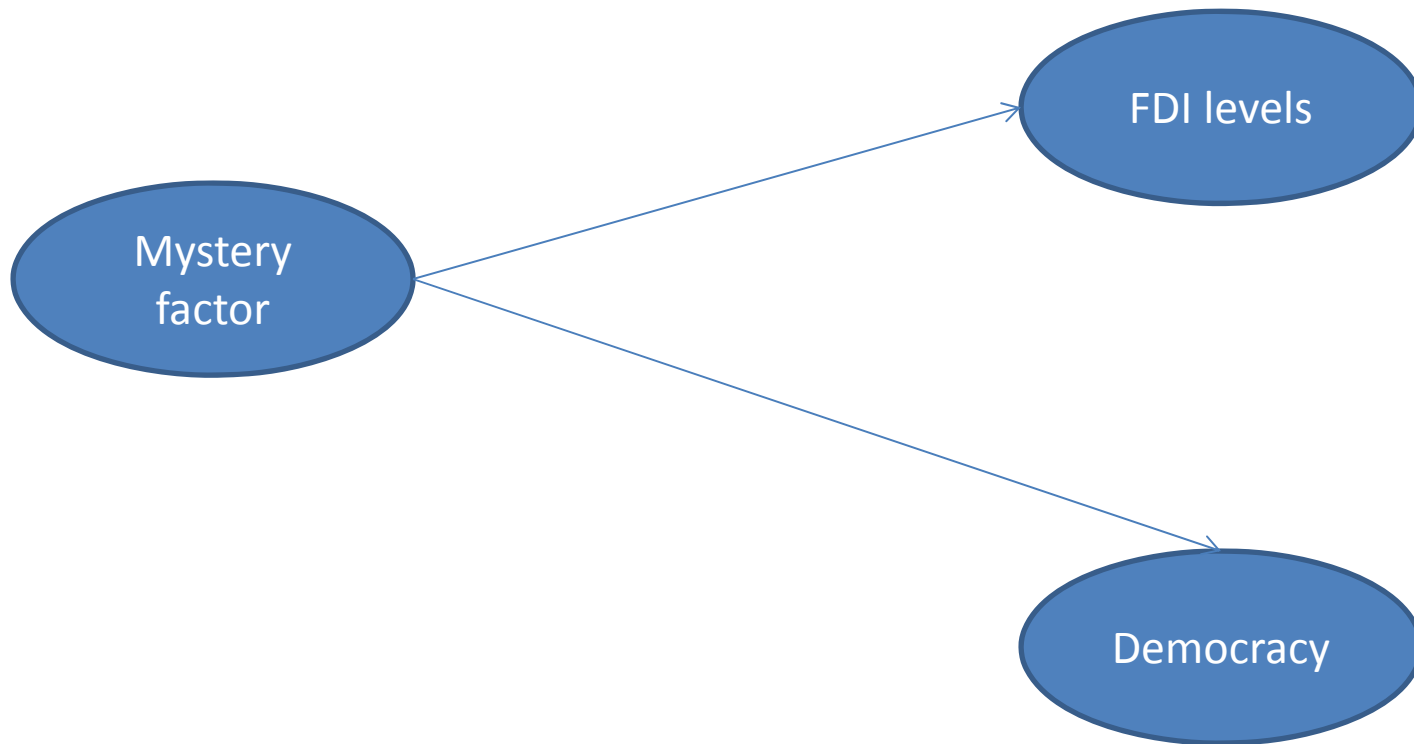
```
Number of obs   =      670
F(    9,    141) =      66.08
Prob > F        =      0.0000
R-squared       =      0.8973
Adj R-squared   =      0.8676
Root MSE       =      0.8365
```

(Std. Err. adjusted for 142 clusters in country)

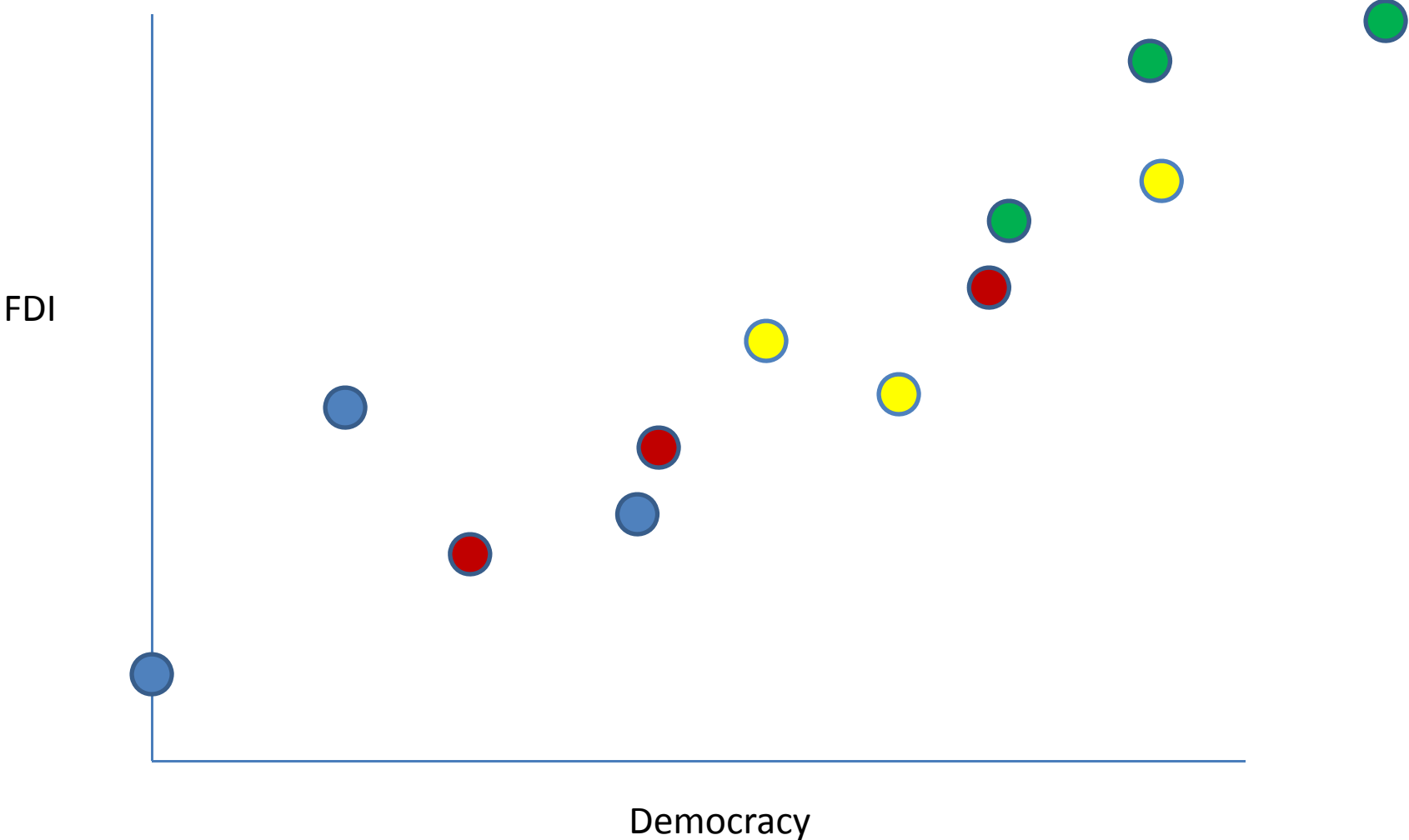
	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
logfdipercapita						
polity020	.0083865	.0203106	0.41	0.680	-.0317662	.0485393
loggnipercapita	1.231244	.3243603	3.80	0.000	.5900064	1.872483
gnipercapitagrowth	.0581353	.014221	4.09	0.000	.0300214	.0862492
rentspercentgdp	.011246	.0106892	1.05	0.295	-.0098859	.0323778
_p2	.1850292	.1896949	0.98	0.331	-.1899845	.560043
_p3	.5367495	.2685835	2.00	0.048	.0057782	1.067721
_p4	1.169506	.2969479	3.94	0.000	.58246	1.756551
_p5	1.08715	.385772	2.82	0.006	.3245053	1.849795
_p6	1.585819	.4781293	3.32	0.001	.6405903	2.531048
_cons	-7.893497	2.522335	-3.13	0.002	-12.87998	-2.907013
country	absorbed				(142 categories)	

	Original	w/Fixed effects	w/f.e. & clustered s.e.	w/f.e. & clustered s.e. & period dummies
Polity	0.027 (0.010)	0.036 (0.012)	0.036 (0.021)	0.008 (0.020)
ln(GNI/capita)	1.36 (0.05)	2.31 (0.01)	2.31 (0.15)	1.23 (0.32)
GNI growth/capita	0.099 (0.013)	0.069 (0.012)	0.069 (0.015)	0.058 (0.014)
Nat. resource rents/GDP	0.010 (0.004)	0.015 (0.008)	0.015 (0.012)	0.011 (0.011)
Period dummies				
-Period 2	---	---	---	0.19 (0.19)
-Period 3	---	---	---	0.54 (0.27)
-Period 4	---	---	---	1.17 (0.30)
-Period 5	---	---	---	1.09 (0.39)
-Period 6	---	---	---	1.59 (0.48)
Constant	-8.46 (0.33)	-16.44 (0.77)	-16.44 (1.09)	-7.89 (2.52)
N	670	670	670	670
s.e.r.	1.26	0.88	0.88	0.84
R ²	.70	.89	.89	.90

Conclusion?



What we would like the world to be like



What the world is probably like

