

S&P Sovereign Debt Ratings: *Regional Dummies in Action*

```
use "standard and poors dataset v5.dta", clear
. tab region
```

	region	Freq.	Percent	Cum.
	Africa	19	14.50	14.50
	Asia-Pacific	21	16.03	30.53
Central America and Caribbean		14	10.69	41.22
	Europe	48	36.64	77.86
	Middle East	12	9.16	87.02
	North America	4	3.05	90.08
	South America	13	9.92	100.00
	Total	131	100.00	

```
. egen region2 = group(region)
. tab region region2
```

	region	group(region)							Total
		1	2	3	4	5	6	7	
	Africa	19	0	0	0	0	0	0	19
	Asia-Pacific	0	21	0	0	0	0	0	21
Central America and..		0	0	14	0	0	0	0	14
	Europe	0	0	0	48	0	0	0	48
	Middle East	0	0	0	0	12	0	0	12
	North America	0	0	0	0	0	4	0	4
	South America	0	0	0	0	0	0	13	13
	Total	19	21	14	48	12	4	13	131

```
. gen africa=(region2==1)
. tab region africa
```

	region	africa		Total
		0	1	
	Africa	0	19	19
	Asia-Pacific	21	0	21
Central America and..		14	0	14
	Europe	48	0	48
	Middle East	12	0	12
	North America	4	0	4
	South America	13	0	13
	Total	112	19	131

```
. gen asiapac=(region2==2)
. tab region asiapac
```

	region	asiapac		Total
		0	1	
	Africa	19	0	19
	Asia-Pacific	0	21	21
Central America and..		14	0	14
	Europe	48	0	48
	Middle East	12	0	12
	North America	4	0	4
	South America	13	0	13
	Total	110	21	131

```
. reg nsrate corrupt lngdp deficit_gdp debt_gdp inflation
. eststo
```

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```
. reg nsrate corrupt lngdp deficit_gdp debt_gdp inflation africa
. eststo

. reg nsrate corrupt lngdp deficit_gdp debt_gdp inflation asiapac
. eststo

. reg nsrate corrupt lngdp deficit_gdp debt_gdp inflation europe
. eststo

. reg nsrate corrupt lngdp deficit_gdp debt_gdp inflation africa asiapac europe
. eststo

. esttab, r2 ar2 compress
```

	(1) nsrate	(2) nsrate	(3) nsrate	(4) nsrate	(5) nsrate
corrupt	0.0563*** (11.79)	0.0558*** (11.64)	0.0564*** (11.69)	0.0552*** (11.05)	0.0551*** (10.97)
lngdp	0.407*** (8.89)	0.395*** (8.41)	0.403*** (8.28)	0.410*** (8.90)	0.394*** (7.93)
deficit_~p	-0.0655** (-2.83)	-0.0635** (-2.73)	-0.0659** (-2.83)	-0.0616* (-2.59)	-0.0609* (-2.54)
debt_gdp	-0.0120*** (-4.92)	-0.0120*** (-4.91)	-0.0120*** (-4.90)	-0.0121*** (-4.94)	-0.0121*** (-4.89)
inflation	-0.0380* (-1.98)	-0.0325 (-1.63)	-0.0374 (-1.92)	-0.0382* (-1.99)	-0.0327 (-1.62)
africa		-0.253 (-1.06)			-0.198 (-0.77)
asiapac			0.0528 (0.23)		0.0913 (0.36)
europe				0.131 (0.74)	0.121 (0.58)
_cons	2.017*** (6.24)	2.108*** (6.31)	2.018*** (6.22)	1.999*** (6.16)	2.074*** (6.07)
N	115	115	115	115	115
R-sq	0.811	0.813	0.811	0.812	0.814
adj. R-sq	0.803	0.803	0.801	0.802	0.800

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

```
. test africa asiapac europe
```

```
( 1) africa = 0
( 2) asiapac = 0
( 3) europe = 0
```

```
F( 3, 106) = 0.48
Prob > F = 0.6938
```

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```
. eststo clear
. reg nsrate corrupt lngdp deficit_gdp debt_gdp inflation i.region2
```

Source	SS	df	MS	Number of obs	=	115
Model	332.773222	11	30.2521111	F(11, 103)	=	43.78
Residual	71.1759968	103	.691029095	Prob > F	=	0.0000
				R-squared	=	0.8238
				Adj R-squared	=	0.8050
Total	403.949219	114	3.5434142	Root MSE	=	.83128

nsrate	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
corrupt	.0558288	.004984	11.20	0.000	.0459441 .0657135
lngdp	.3546349	.0533155	6.65	0.000	.2488962 .4603736
deficit_gdp	-.0647095	.0240016	-2.70	0.008	-.112311 -.017108
debt_gdp	-.0116505	.0024645	-4.73	0.000	-.0165382 -.0067628
inflation	-.0302933	.020052	-1.51	0.134	-.0700616 .0094751
region2					
2	.3758305	.3145136	1.19	0.235	-.247933 .999594
3	-.3634376	.3487438	-1.04	0.300	-1.055089 .3282134
4	.3513205	.2701102	1.30	0.196	-.1843793 .8870203
5	.5094299	.3588104	1.42	0.159	-.2021859 1.221046
6	.5794648	.5762459	1.01	0.317	-.5633829 1.722313
7	.3836084	.3154718	1.22	0.227	-.2420555 1.009272
_cons	1.972719	.3656727	5.39	0.000	1.247494 2.697945

Run the (joint) F test with testparm!

```
. testparm i.region2
```

```
( 1) 2.region2 = 0
( 2) 3.region2 = 0
( 3) 4.region2 = 0
( 4) 5.region2 = 0
( 5) 6.region2 = 0
( 6) 7.region2 = 0
```

```
F( 6, 103) = 1.23
Prob > F = 0.2979
```

```
. gen resid = nsrate - (.0558288*corrupt + .3546349 *lngdp -.0647095*deficit_gdp -
.0116505*debt_gdp-.0302933*inflation)
(16 missing values generated)
```

```
. gen resid2 = resid - 1.972718
```

```
. tabstat resid resid2, by(region2)
```

region2	resid	resid2
1	1.972718	3.76e-07
2	2.348548	.3758304
3	1.60928	-.3634376
4	2.324038	.3513203
5	2.482148	.5094299
6	2.552182	.5794643
7	2.356327	.3836086
Total	2.235801	.2630826

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Bring on areg!

```
. areg nsrate corrupt lngdp deficit_gdp debt_gdp inflation, absorb(region2)
```

```
Linear regression, absorbing indicators      Number of obs   =      115
                                           F(   5,   103)   =      59.56
                                           Prob > F         =      0.0000
                                           R-squared        =      0.8238
                                           Adj R-squared    =      0.8050
                                           Root MSE        =      0.8313
```

```
-----+-----
      nsrate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      corrupt |   .0558288   .004984    11.20   0.000   .0459441   .0657135
       lngdp  |   .3546349   .0533155     6.65   0.000   .2488962   .4603736
deficit_gdp  |  -.0647095   .0240016    -2.70   0.008   -.112311   -.017108
   debt_gdp   |  -.0116505   .0024645    -4.73   0.000   -.0165382  -.0067628
   inflation  |  -.0302933   .020052    -1.51   0.134   -.0700616   .0094751
       _cons  |   2.235802   .3468479     6.45   0.000   1.547911   2.923693
-----+-----
      region2 |             F(6, 103) =      1.228   0.298             (7 categories)
```

```
. eststo
. esttab, r2 ar2 compress
```

```
-----+-----
              (1)      (2)
              nsrate    nsrate
-----+-----
corrupt      0.0558***   0.0558***
              (11.20)    (11.20)

lngdp        0.355***    0.355***
              (6.65)     (6.65)

deficit_~p   -0.0647**   -0.0647**
              (-2.70)    (-2.70)

debt_gdp     -0.0117***   -0.0117***
              (-4.73)    (-4.73)

inflation    -0.0303      -0.0303
              (-1.51)    (-1.51)

1.region2    0
              (.)

2.region2    0.376
              (1.19)

3.region2    -0.363
              (-1.04)

4.region2    0.351
              (1.30)

5.region2    0.509
              (1.42)

6.region2    0.579
              (1.01)

7.region2    0.384
              (1.22)

_cons        1.973***     2.236***
              (5.39)     (6.45)
-----+-----
N            115          115
R-sq         0.824        0.824
adj. R-sq     0.805        0.805
-----+-----
t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001
```

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areg also works with string variables

```
. areg nsrate corrupt lngdp deficit_gdp debt_gdp inflation, absorb(region)
```

Linear regression, absorbing indicators	Number of obs	=	115
	F(5, 103)	=	59.56
	Prob > F	=	0.0000
	R-squared	=	0.8238
	Adj R-squared	=	0.8050
	Root MSE	=	0.8313

nsrate	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
corrupt	.0558288	.004984	11.20	0.000	.0459441	.0657135
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inflation	-.0302933	.020052	-1.51	0.134	-.0700616	.0094751
_cons	2.235802	.3468479	6.45	0.000	1.547911	2.923693
region	F(6, 103) =		1.228	0.298	(7 categories)	

Creating dummies for string variables

```
. xi i.region
i.region      _Iregion_1-7      (_Iregion_1 for region==Africa omitted)
```

```
. desc _I*
```

variable name	storage type	display format	value label	variable label
_Iregion_2	byte	%8.0g		region==Asia-Pacific
_Iregion_3	byte	%8.0g		region==Central America and Caribbean
_Iregion_4	byte	%8.0g		region==Europe
_Iregion_5	byte	%8.0g		region==Middle East
_Iregion_6	byte	%8.0g		region==North America
_Iregion_7	byte	%8.0g		region==South America

```
. summ _I*
```

Variable	Obs	Mean	Std. Dev.	Min	Max
_Iregion_2	131	.1603053	.3682974	0	1
_Iregion_3	131	.1068702	.3101342	0	1
_Iregion_4	131	.3664122	.4836736	0	1
_Iregion_5	131	.0916031	.2895721	0	1
_Iregion_6	131	.0305344	.1727128	0	1
_Iregion_7	131	.0992366	.3001272	0	1

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```
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```

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_Iregion_5	.5094299	.3588104	1.42	0.159	-.2021859	1.221046
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_cons	1.972719	.3656727	5.39	0.000	1.247494	2.697945