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[1]http://replication.uni-goettingen.de/wiki/index.php/Replication_in_the_narrow_sense_of_%22Financial_Stability,_the_Trilemma,_and_International_Reserves%22_(Obstfeld,_Shambaugh_%26_Taylor_2010)_(CfS_2014)

Replication in the narrow sense of "Financial Stability, the Trilemma, and International Reserves" (Obstfeld, Shambaugh & Taylor 2010)

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March 12, 2014

Abstract

This is a partly successful replication of "Financial Stability, the Trilemma and International Reserves" (Obstfeld et al. 2010) published in the American Economic Journal: Macroeconomics.[1] This replication is part of a research project on the replicability of empirical articles in economics.[2] A replication in the narrow sense by our means is a repetition of empirical research, using the same datasets as well as the same program codes as in the original article. The AER Data Availability Policy requires that the authors provide data and programs that permits replication, but only need to give access to raw data on request. The authors have been contacted per mail but have not replied so far.[3]

The results of all regressions shown in the paper can be replicated by using the data and code that the authors provide.[4] The code for several graphs is not provided in the do-file.[5] We find that it is difficult to replicate the variables in the dta-file given that the raw data is not included and the description of the variables not sufficiently precise.[6] The authors refer to several Davidson-MacKinnon tests[7], to show that their suggested financial stability model outperforms the traditional one.[8] We can not find the corresponding STATA code in the do-file.

[1]See Obstfeld et al. p. 54-94.

[2]http://ineteconomics.org/grants/replication-economics

[3]http://www.aeaweb.org/aer/data.php/ (01.09.2013)

[4]All tests in this paper refer to the pooled OLS regressions in table 1, page 73.

[5]See Obstfeld et al. (2010), p. 86-90.

[6]The variable lnm2gdp is labeled as nat log M2/GDP WDI data augmented with IFS money data for EMU countries. There are several variables like GDP for which different versions exist and the augmentation procedure is not clearly described.

[7]See Davidson/MacKinnon (1981), p. 78-193.

[8]See Obstfeld et al. (2010), p. 74.

We receive results that support the argumentation of the authors by programming the tests. Like the Davidson-MacKinnon test the non-nested F-test can be applied to compare non-nested models as well. We find that with this test we can not decide for one of the models.[9] We run additional tests for the model specification and the robustness of the results. The RESET test[10] indicates functional form problems. Linear forms of heteroscedasticity can be identified with the Breusch Pagan test[11] and nonlinear heteroscedasticity with the White test[12]. The tests indicate heteroscedasticity, so that it is appropriate that the authors deal with this by clustering by countries. There are no problems with multicollinearity according to the correlation matrix and the variance influence factor (VIF).[13]

The authors point out that the financial stability model performs well relative to the traditional model while referring to the R^2 statistic. They also argue that for the regressions R^2 and R^2 adjusted ($R^2_{ad.}$) are always identical to two decimal places.[14] We use further model selection criterions to compare the traditional and financial stability model.[15] We use the $R^2_{ad.}$[16], the Akaike information criterion (AIC)[17] and the Bayesian information criterion (BIC). The results of these criterions underline the results of the authors, given that the values of AIC and BIC criterions of the financial stability model are smaller than the values of the traditional model.[18] We identify observations with standardized residuals larger than 2 and list the name of the country and the year as well as the leverage statistic.[19] We find that in particular developing countries have large residuals, however only a small minority of them are particular influencial according to the leverage statistic.[20]

[9] A commented code and the output of the tests can be found in the appendix in section 1 and 2.

[10] See Ramsey (1969), p. 361-362.

[11] See Breusch/Pagan (1979), p. 1287-1288.

[12] See White (1980), p. 821-825.

[13] Values of the VIF larger than 4 and 10 are seen as indicators for high multicollinearity according to O'Brien (2007). As can be seen in the appendix in section 3, we receive smaller VIF values. The correlation maxtrix includes the variables the regression in column 5.

[14] See Obstfeld et al. (2010), p. 76. For the later they do not provide the statistics, but we calculated them and can confirm the statement.

[15] The R^2 always increases when further variables are added to the model. Thus it seems to be appropriate to also use model selection criterions that take this effect into account.

[16] See Greene (2002), p. 35.

[17] See Akaike (1974), p. 716-723.

[18] The code and output of the additional selection criterions can be found in appendix in section 4. For an overview of the AIC and BIC criterions see Weißer (2012), p. 9-10.

[19] The code and output can be found in appendix in section 5.

[20] Hoaligan and Welsch (1978), p. 17., provide a cut of score of $h_j > 2 * \frac{k}{n}$ for the leverage statistic.

Appendix

Section 1: Davidson-MacKinnon test

The authors state the following about the model comparison of the regressions in table1:
We perform tests suggested by Russell Davidson and James G. MacKinnon (1981). First, we include the fitted value based on the financial stability model of column 6 in a regression equation including the traditional model of column 1. The coefficient on the fitted value is highly statistically significant. This suggests that omitting the financial variables excludes important information: the traditional model is misspecified. The same holds true when using the fitted value from a regression like column 7 that includes only our financial variables. Alternatively, when including the fitted value from a regression like column 1 as additional regressors in the specification of column 6, the coefficient on the fitted value is not significantly different from zero, even at the 10 percent level. This result suggests that the traditional model adds no information once the variables in our financial stability model are included.[21]

The fitted values of regression six and seven, which contain the financial variables, are stored with the command predict in the variables myhat6 and myhat7.[22] Included in the first regression both are highly significant, which is in line with the results of the authors. Furthermore, the fitted values of regression one are stored in the variable myhat1 and included in regression six. The hypothesis that the coefficient of the fitted values of regression one is significantly different from zero can be rejected at every usual level. This is in line with the results of the authors as well.[23]

[21] See Obstfeld et al., 74.

[22] The original regressions are taken from the do-file of the authors.

[23] The regression output of regression one with the inclusion of myhat6 (OLS1), myhat7 (OLS2) and myhat1 (OLS3) can be seen in table 1.

```
*Davidson-MacKinnon test

*regression 6
reg lnresgdp newkopen2 peg softpeg lnm2gdp lntradegdp advanced
if year > 1979  & samp1 == 1 & samp2 == 1;
*the fitted values of regression 6 are stored in the variable myhat6
predict myhat6, xb;
*regression 7
reg lnresgdp newkopen2 peg softpeg lnm2gdp advanced
if year > 1979  & samp1 == 1 & samp2 == 1;
*the fitted values of regression 7 are stored in the variable myhat7
predict myhat7, xb
*run regression 1 with the fitted values of regression 6 and 7,
*the t-test that myhat6 and myhat7 is zero is already included in the output
reg lnresgdp lpop lntradegdp evol lngdppercap myhat6
if year > 1979  & samp1 == 1 & samp2 == 1;
reg lnresgdp lpop lntradegdp evol lngdppercap myhat7
if year > 1979  & samp1 == 1 & samp2 == 1;
*regression 1
reg lnresgdp lpop lntradegdp evol lngdppercap
if year > 1979  & samp1 == 1 & samp2 == 1;
*save fitted values of regression 1
predict myhat1, xb;
*run regression 6 with the fitted values of regression 1
reg lnresgdp newkopen2 peg softpeg lnm2gdp lntradegdp advanced myhat1
if year > 1979  & samp1 == 1 & samp2 == 1, cluster(ifs);
```

Table 1: OLS models for the Davidson-MacKinnon test

VARIABLES	OLS1	OLS2	OLS3
newkopen2			0.598***
			(0.172)
peg			0.0939
			(0.0772)
softpeg			0.163***
			(0.0594)
lnm2gdp			0.279***
			(0.0844)
lntradegdp	-0.0169	0.547***	0.0832
	[0.0529]	(0.0322)	(0.431)
advanced			-0.623***
			(0.145)
myhat1			0.623
			(0.542)
lpop	-0.0138	-0.0112	
	[0.00895]	(0.00894)	
evol	-7.04e-05	0.000857	
	[0.0138]	(0.0138)	
lngdppercap	0.0334**	0.0401***	
	[0.0134]	(0.0133)	
myhat6	0.971***		
	[0.0534]		
myhat7		0.628***	
		(0.0347)	
Constant	-0.0554	-3.307***	-2.553
	[0.426]	(0.298)	(3.256)
Observations	2,671	2,671	2,671
R-squared	0.383	0.383	0.384

Standard errors in brackets
*** $p < 0.01, ** p < 0.05, * p < 0.1$

Table 1: Source: Own calculations

Section 2: Non-nested F-test

Like the Davidson-McKinnon test the non-nested F-test can be applied in the case when the models are non-nested. For this purpose a giant model which includes the variables of both models is used. The null hypothesis that the coefficient of the first model are simultaneously zero and the null hypothesis that the coefficient of the second are simultaneously zero is tested. When we receive the result that the coefficients of the first model are all significant and the coefficients of the second model are not we choose the first model and the other way round.[24] However, according to the F-test the coefficients of the traditional as well as the coefficients of the financial stability model are both simultaneously significantly different from zero. Thus, according to the non-nested F-test we can not decide for one of the models.

```
* non-nested F-test
*regression 1
reg lnresgdp lpop lntradegdp evol lngdppercap
if year > 1979  & samp1 == 1 & samp2 == 1;
*regression 6
reg lnresgdp newkopen2 peg softpeg lnm2gdp lntradegdp advanced
if year > 1979  & samp1 == 1 & samp2 == 1, cluster(ifs);
*the predictor varaibles of regression 1 and regression 6 are included in one model
reg lnresgdp lpop lntradegdp evol lngdppercap newkopen2 peg softpeg lnm2gdp advanced
if year > 1979  & samp1 == 1 & samp2 == 1;
*the null hypothesis (F-test) is tested that the variables of regression 1
*are simultaneously zero
test lpop lntradegdp evol lngdppercap;
*the null hypothesis (F-test) is tested that the variables of regression 6
*are simultaneously zero
test newkopen2 peg softpeg lnm2gdp advanced;
```

[24]See Wooldridge, p. 305.

Output:

```
*the null hypothesis (F-test) is tested that the variables of regression 1
*are simultaneously zero
test lpop lntradegdp evol lngdppercap;
 ( 1)  lpop = 0
 ( 2)  lntradegdp = 0
 ( 3)  evol = 0
 ( 4)  lngdppercap = 0
       F(  4,  2661) =  124.50
            Prob > F =    0.0000
*the null hypothesis (F-test) is tested that the variables of regression 6
*are simultaneously zero
test newkopen2 peg softpeg lnm2gdp advanced;
 ( 1)  newkopen2 = 0
 ( 2)  peg = 0
 ( 3)  softpeg = 0
 ( 4)  lnm2gdp = 0
 ( 5)  advanced = 0
       F(  5,  2661) =   67.25
            Prob > F =    0.0000
```

.

Section 3: Further model specification tests

The tests are applied and shown for the traditional model (column1, table1) and the enhanced model with the financial stability variables (column6, table1) .

```
column1, table1:

* RESET test

estat ovtest

Ramsey RESET test using powers of the fitted values of lnresgdp
       Ho:  model has no omitted variables
                F(3, 2663) =     14.21
                  Prob > F =      0.0000

*Breusch Pagan test

estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lnresgdp

         chi2(1)      =     3.19
         Prob > chi2  =   0.0741
```

```
* White test

estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     109.22     14    0.0000
            Skewness |      54.27      4    0.0000
            Kurtosis |      10.79      1    0.0010
---------------------+-----------------------------
               Total |     174.27     19    0.0000
---------------------------------------------------


corr lnresgdp newkopen2 lnm2gdp lntradegdp advanced lpop
evol lngdppercap if year > 1979 & samp1 == 1 & samp2 == 1
(obs=2671)

             | lnresgdp newkop~2  lnm2gdp lntrad~p advanced     lpop evol lngdpp~p
-------------+--------------------------------------------------------------------------
    lnresgdp |   1.0000
   newkopen2 |   0.2852   1.0000
     lnm2gdp |   0.3382   0.3638   1.0000
  lntradegdp |   0.5406   0.2526   0.2780   1.0000
    advanced |  -0.1118   0.4035   0.3648  -0.1235   1.0000
        lpop |  -0.3116  -0.1028  -0.0310  -0.5917   0.1235   1.0000
        evol |  -0.0225  -0.0409  -0.0359  -0.0181  -0.0194  -0.0149  1.0000
 lngdppercap |   0.2431   0.5511   0.5756   0.2342   0.5673  -0.0787 -0.0236   1.00
```

*Variance Influence test for multicolinearity

estat vif

```
    Variable |       VIF       1/VIF
-------------+----------------------
  lntradegdp |      1.63    0.613950
        lpop |      1.55    0.645470
 lngdppercap |      1.06    0.939364
        evol |      1.00    0.998355
-------------+----------------------
    Mean VIF |      1.31
```

column6, table1:

* RESET test

estat ovtest

```
Ramsey RESET test using powers of the fitted values of lnresgdp
       Ho:  model has no omitted variables
                 F(3, 2661) =      3.32
                   Prob > F =      0.0191
```

*Breusch Pagan test

estat hettest

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of lnresgdp

         chi2(1)      =     5.05
         Prob > chi2  =   0.0246
```

```
* White test

estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df      p
---------------------+-----------------------------
  Heteroskedasticity |     124.44     23    0.0000
            Skewness |      45.45      6    0.0000
            Kurtosis |      23.84      1    0.0000
---------------------+-----------------------------
               Total |     193.72     30    0.0000
---------------------------------------------------
* correlation matrix of variables

corr lnresgdp newkopen2 lnm2gdp lntradegdp
(obs=2770)

             | lnresgdp newkop~2  lnm2gdp lntrad~p
-------------+------------------------------------
    lnresgdp |   1.0000
   newkopen2 |   0.2535   1.0000
     lnm2gdp |   0.3348   0.3482   1.0000
  lntradegdp |   0.5321   0.2463   0.2776   1.0000



*Variance Influence test for multicolinearity
```

```
estat vif

    Variable |       VIF       1/VIF  
-------------+----------------------
    advanced |      1.43    0.697484
   newkopen2 |      1.39    0.721990
     lnm2gdp |      1.37    0.732257
         peg |      1.35    0.739832
     softpeg |      1.32    0.754801
  lntradegdp |      1.31    0.764596
-------------+----------------------
    Mean VIF |      1.36
```

Section 4: Further model selection criterions.

```
*regression 1
reg lnresgdp newkopen2 peg lnm2gdp lntradegdp advanced
if year > 1979  , cluster(ifs);
estat ic;

*regression 2
reg lnresgdp newkopen2 peg softpeg lnm2gdp lntradegdp advanced
if year > 1979  & samp1 == 1 & samp2 == 1;
estat ic;
```

Output:

*regression 1

```
-----------------------------------------------------------------------------
       Model |    Obs    ll(null)   ll(model)     df          AIC         BIC
-------------+---------------------------------------------------------------
           . |   2770   -3639.835   -3021.318      6     6054.636    6090.195
-----------------------------------------------------------------------------
```

*regression 6

```
-----------------------------------------------------------------------------
       Model |    Obs    ll(null)   ll(model)     df          AIC         BIC
-------------+---------------------------------------------------------------
           . |   2671   -3495.576   -2854.227      7     5722.454    5763.685
-----------------------------------------------------------------------------
```

Section 5: Outlier detection

```
*traditional model
reg lnresgdp lpop lntradegdp evol lngdppercap
if year > 1979  & samp1 == 1 & samp2 == 1
predict stanresid1, rstandard
predict lev, leverage
predict cooksd, cooksd

*Leverage
di 2*(5/2671)

list stanresid1 lev year country_name if (stanresid1> 2 & stanresid1!=.)
list stanresid1 lev year country_name if (stanresid1< -2 & stanresid1!=.)

list stanresid1 lev year country_name
if (stanresid1> 2 & stanresid1!=. & lev > .00374392)
list stanresid1 lev year country_name
if (stanresid1< -2 & stanresid1!=. & lev > .00374392)

*Leverage
di 2*(5/2671)
.00374392

list stanresid1 lev year country_name if (stanresid1> 2 & stanresid1!=.)

      +-------------------------------------------+
      | stanre~1        lev   year    country_name |
      |-------------------------------------------|
 198. | 2.127584    .000849   1980     Switzerland |
 200. | 2.016048   .0009957   1982     Switzerland |
 355. | 2.125615   .0017395   1980           Malta |
 356. | 2.212943   .0015772   1981           Malta |
```

357.	2.351682	.0014509	1982	Malta
358.	2.455526	.001425	1983	Malta
359.	2.305786	.0014709	1984	Malta
360.	2.245548	.0015178	1985	Malta
361.	2.16106	.0014812	1986	Malta
362.	2.091776	.001554	1987	Malta
380.	2.08818	.0004449	1980	Portugal
499.	2.016377	.0049163	1980	Argentina
1174.	3.388607	.0010562	1989	Lebanon
1175.	3.092432	.0009943	1990	Lebanon
1176.	2.744214	.0006052	1991	Lebanon
1177.	2.567918	.0005222	1992	Lebanon
1178.	2.565685	.0004797	1993	Lebanon
1179.	2.691136	.0004742	1994	Lebanon
1180.	2.494188	.000455	1995	Lebanon
1181.	2.541666	.00047	1996	Lebanon
1182.	2.36261	.0005246	1997	Lebanon
1183.	2.464345	.0006446	1998	Lebanon
1184.	2.708946	.0007372	1999	Lebanon
1185.	2.436288	.0007418	2000	Lebanon
1186.	2.132541	.0006091	2001	Lebanon
1187.	2.528376	.0007151	2002	Lebanon
1188.	3.004979	.0006589	2003	Lebanon
1189.	2.652257	.0005165	2004	Lebanon
1320.	2.024079	.0016286	2002	Yemen, Rep.
1321.	2.042403	.0016264	2003	Yemen, Rep.
1322.	2.021309	.0015614	2004	Yemen, Rep.
1705.	2.03158	.0006793	2002	Algeria

1706.	2.218935	.0007159	2003	Algeria
1707.	2.191247	.0007738	2004	Algeria
1722.	2.033041	.0009464	1985	Botswana
1723.	2.292405	.0009113	1986	Botswana
1724.	2.493773	.0009226	1987	Botswana
1725.	2.289929	.0007882	1988	Botswana
1726.	2.458209	.0007039	1989	Botswana
1727.	2.412133	.0006904	1990	Botswana
1728.	2.5519	.0006613	1991	Botswana
1729.	2.611981	.0006394	1992	Botswana
1730.	2.753973	.0006361	1993	Botswana
1731.	2.765388	.00063	1994	Botswana
1732.	2.710183	.0006285	1995	Botswana
1733.	2.751718	.0006312	1996	Botswana
1734.	2.737916	.0006547	1997	Botswana
1735.	2.846083	.0006658	1998	Botswana
1736.	2.838294	.0006878	1999	Botswana
1737.	2.738767	.0007241	2000	Botswana
1738.	2.736701	.0007755	2001	Botswana
1739.	2.620493	.0007943	2002	Botswana
1740.	2.157017	.0008505	2003	Botswana
1741.	2.009721	.0009106	2004	Botswana
1758.	2.118166	.0031376	1996	Burundi
1804.	2.03005	.0022711	2002	Comoros
1874.	2.319571	.0089546	1982	Ghana
1912.	2.183127	.001595	2002	Guinea-Bissau

```
. list stanresid1 lev year country_name if (stanresid1< -2 & stanresid1!=.)

      +------------------------------------------------------+
      | stanres~1        lev   year          country_name |
      |------------------------------------------------------|
  21. | -2.057678     .00385   2000         United States |
 237. | -2.115977   .0014888   1994                Canada |
 238. | -2.021083   .0015643   1995                Canada |
 240. | -2.036118   .0017012   1997                Canada |
 449. | -2.460918   .0007858   1980           New Zealand |
      |------------------------------------------------------|
 482. |  -2.03793   .0007398   1988          South Africa |
 483. | -2.085016   .0007813   1989          South Africa |
 490. | -2.197778   .0008802   1996          South Africa |
 659. |  -3.27691   .0004292   1990    Dominican Republic |
 666. | -2.246253   .0006491   1997    Dominican Republic |
      |------------------------------------------------------|
 667. | -2.042935   .0007224   1998    Dominican Republic |
 669. | -2.029292   .0007032   2000    Dominican Republic |
 671. | -2.365922    .000559   2002    Dominican Republic |
 672. | -3.032922   .0008297   2003    Dominican Republic |
 701. | -2.907067   .0007798   1982                 Haiti |
      |------------------------------------------------------|
 702. | -2.613814   .0008506   1983                 Haiti |
 703. | -2.518289   .0008756   1984                 Haiti |
 704. | -3.239928   .0008312   1985                 Haiti |
 705. | -2.366318   .0010744   1986                 Haiti |
 706. | -2.233625   .0009571   1987                 Haiti |
      |------------------------------------------------------|
 707. | -2.550002   .0009905   1988                 Haiti |
 708. | -2.693723   .0010668   1989                 Haiti |
 709. | -3.764648   .0010457   1990                 Haiti |
 710. | -2.420427   .0005842   1991                 Haiti |
```

731.	-2.336226	.000619	1988	Honduras
732.	-3.340091	.0005243	1989	Honduras
733.	-2.590269	.0007974	1990	Honduras
750.	-2.098082	.0015405	1982	Mexico
762.	-2.03563	.0012373	1994	Mexico
928.	-2.998688	.001904	1980	Guyana
929.	-3.666787	.0016519	1981	Guyana
930.	-2.573233	.0013062	1982	Guyana
931.	-3.134849	.0012371	1983	Guyana
932.	-2.971971	.0011839	1984	Guyana
933.	-3.038112	.0012061	1985	Guyana
934.	-2.639519	.0011539	1986	Guyana
935.	-2.819039	.0018035	1987	Guyana
936.	-3.745622	.0013362	1988	Guyana
937.	-2.078462	.0015555	1989	Guyana
957.	-2.307885	.0021158	1984	Belize
979.	-2.022337	.0009915	1981	Jamaica
981.	-2.413268	.000759	1983	Jamaica
987.	-2.205248	.0006916	1989	Jamaica
989.	-2.216794	.0006798	1991	Jamaica
1482.	-5.379102	.0017149	1988	Lao PDR
1483.	-2.234781	.0015196	1989	Lao PDR
1484.	-2.303171	.0017326	1990	Lao PDR
1710.	-2.114864	.0021438	1998	Angola
1714.	-2.125494	.0021605	2002	Angola
1779.	-2.644045	.0014614	1998	Cape Verde
1820.	-2.51647	.0038661	1993	Congo, Dem. Rep.
1832.	-2.307552	.0034755	1990	Ethiopia

1847.	-2.235062	.0018757	1980	Gambia, The
1848.	-2.646334	.0017958	1981	Gambia, The
1850.	-3.052843	.0016588	1983	Gambia, The
1851.	-3.178442	.0016314	1984	Gambia, The
1852.	-3.681835	.0015175	1985	Gambia, The
1941.	-2.701137	.0012247	1992	Kenya
1996.	-4.392892	.001518	1980	Madagascar
1997.	-2.558803	.0018107	1981	Madagascar
1998.	-2.838011	.0019061	1982	Madagascar
1999.	-2.193722	.0021275	1983	Madagascar
2183.	-2.129431	.0027451	1984	Seychelles
2185.	-2.011754	.0028363	1986	Seychelles
2187.	-2.316507	.0028457	1988	Seychelles
2188.	-2.051775	.0028489	1989	Seychelles
2195.	-2.078252	.0028538	1996	Seychelles
2197.	-2.337176	.0029804	1998	Seychelles
2198.	-2.028211	.0029099	1999	Seychelles
2203.	-2.226342	.0028864	2004	Seychelles
2205.	-2.278645	.001719	1981	Sierra Leone
2206.	-2.934209	.0019103	1982	Sierra Leone
2208.	-2.199292	.0033231	1984	Sierra Leone
2211.	-2.791857	.0015107	1987	Sierra Leone
2212.	-2.865738	.0017831	1988	Sierra Leone
2213.	-3.583785	.0017984	1989	Sierra Leone
2214.	-2.710654	.0016163	1990	Sierra Leone
2215.	-2.198635	.0015553	1991	Sierra Leone
2229.	-2.978096	.0007767	1992	Namibia
2312.	-2.286877	.0021285	1985	Uganda

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2313. |  -2.31596    .002183   1986             Uganda |
2314. | -2.031171   .0025178   1987             Uganda |
2315. | -2.196854   .0022893   1988             Uganda |
2316. | -3.634178   .0021309   1989             Uganda |
2349. |  -2.32099   .0013325   1999             Zambia |
      |--------------------------------------------------|
2435. | -2.297496   .0006744   1994   Papua New Guinea |
2499. | -2.372844    .001252   1997            Belarus |
2501. | -2.541398   .0011208   1999            Belarus |
2502. | -2.405584   .0011591   2000            Belarus |
2503. | -2.376973   .0014906   2001            Belarus |
      |--------------------------------------------------|
2505. | -2.170713   .0013273   2003            Belarus |
2506. | -2.237243   .0014888   2004            Belarus |
2608. | -2.493564   .0014314   1998            Ukraine |
2686. | -2.095023   .0012637   1992           Mongolia |
      +--------------------------------------------------+
```

```
list stanresid1 lev year country_name
if (stanresid1> 2 & stanresid1!=. & lev > .00374392)
```

```
      +-----------------------------------------+
      | stanre~1        lev   year   country~e |
      |-----------------------------------------|
 499. | 2.016377   .0049163   1980   Argentina |
1874. | 2.319571   .0089546   1982       Ghana |
      +-----------------------------------------+
```

```
list stanresid1 lev year country_name
if (stanresid1< -2 & stanresid1!=. & lev > .00374392)

      +-------------------------------------------------+
      | stanres~1        lev   year       country_name |
      |-------------------------------------------------|
  21. | -2.057678     .00385   2000      United States |
1820. |  -2.51647   .0038661   1993   Congo, Dem. Rep. |
      +-------------------------------------------------+

* financial stability model
predict stanresid6, rstandard
predict lev6, leverage
*Leverage
di 2*(7/2671)
list stanresid6 lev6 year country_name
if (stanresid6>2 & stanresid6!=.)
list stanresid6 lev6 year country_name
if (stanresid6<-2 & stanresid6!=.)
list stanresid6 lev6 year country_name
if (stanresid6>2 & stanresid6!=. & lev6 >.00524148)
list stanresid6 lev6 year country_name
if (stanresid6<-2 & stanresid6!=. & lev6 >.00524148)

*Leverage
di 2*(7/2671)
.00524148
```

```
list stanresid6 lev6 year country_name if (stanresid6>2 & stanresid6!=.)

      +---------------------------------------------------+
      | stanre~6       lev6   year          country_name |
      |---------------------------------------------------|
 198. | 2.169245   .0033403   1980           Switzerland |
 199. | 2.101144   .0036119   1981           Switzerland |
 200. | 2.029604   .0033825   1982           Switzerland |
 356. |  2.17257   .0042042   1981                 Malta |
 357. | 2.294278   .0040469   1982                 Malta |
      |---------------------------------------------------|
 358. | 2.369663   .0041853   1983                 Malta |
 359. | 2.222999   .0043137   1984                 Malta |
 360. | 2.184608   .0043444   1985                 Malta |
 380. | 2.829888   .0048861   1980              Portugal |
 381. | 2.251875   .0050075   1981              Portugal |
      |---------------------------------------------------|
 382. | 2.471037   .0050507   1982              Portugal |
 383. | 2.248999   .0050724   1983              Portugal |
 385. | 2.172378   .0051786   1985              Portugal |
 499. | 2.435579   .0043586   1980             Argentina |
 529. | 2.124364   .0042864   1985               Bolivia |
      |---------------------------------------------------|
1018. |  2.01217   .0013218   1995              Suriname |
1028. | 2.196215   .0022776   1980   Trinidad and Tobago |
1029. | 2.351005   .0021617   1981   Trinidad and Tobago |
1030. | 2.018225   .0021086   1982   Trinidad and Tobago |
1174. | 2.643554   .0047085   1989               Lebanon |
      |---------------------------------------------------|
1175. | 2.419034   .0044839   1990               Lebanon |
1176. |  2.19772   .0035021   1991               Lebanon |
1177. | 2.079455   .0030334   1992               Lebanon |
1351. | 2.232886    .002099   1987                Bhutan |
1352. | 2.021603   .0021639   1988                Bhutan |
```

1353.	2.036132	.0018327	1989	Bhutan
1355.	2.195872	.0017645	1991	Bhutan
1357.	2.149817	.0016761	1993	Bhutan
1358.	2.308051	.0016248	1994	Bhutan
1359.	2.07059	.0016151	1995	Bhutan
1360.	2.516765	.0015998	1996	Bhutan
1361.	2.23546	.001579	1997	Bhutan
1362.	2.57574	.0015957	1998	Bhutan
1363.	2.586667	.0016125	1999	Bhutan
1364.	2.624801	.0016472	2000	Bhutan
1365.	2.570321	.0016374	2001	Bhutan
1366.	2.614241	.0016739	2002	Bhutan
1367.	2.364108	.001397	2003	Bhutan
1368.	2.206933	.0013654	2004	Bhutan
1705.	2.32162	.0022154	2002	Algeria
1706.	2.504789	.0023512	2003	Algeria
1707.	2.391688	.001793	2004	Algeria
1722.	2.433353	.0020082	1985	Botswana
1723.	2.473195	.0020627	1986	Botswana
1724.	2.775483	.0018281	1987	Botswana
1725.	2.589705	.001805	1988	Botswana
1726.	2.639096	.0018074	1989	Botswana
1727.	2.611714	.0018336	1990	Botswana
1728.	2.761743	.0017945	1991	Botswana
1729.	2.845477	.0014431	1992	Botswana
1730.	3.056114	.0015939	1993	Botswana
1731.	3.151388	.0018385	1994	Botswana
1732.	3.106057	.0018604	1995	Botswana

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1733. | 3.185148   .0019543   1996             Botswana |
1734. |  3.06144   .0022102   1997             Botswana |
      |-------------------------------------------------|
1735. | 3.002903   .0020191   1998             Botswana |
1736. | 2.945838   .0018701   1999             Botswana |
1737. | 2.881138   .0019518   2000             Botswana |
1738. | 3.081351   .0016865   2001             Botswana |
1739. | 2.704141   .0017892   2002             Botswana |
      |-------------------------------------------------|
1740. | 2.220515   .0017915   2003             Botswana |
1741. | 2.297493   .0016141   2004             Botswana |
1756. | 2.057162   .0012642   1994              Burundi |
1758. | 2.105374   .0021014   1996              Burundi |
1803. | 2.062866   .0018669   2001              Comoros |
      |-------------------------------------------------|
1804. | 2.164313   .0017885   2002              Comoros |
1805. | 2.033939   .0017843   2003              Comoros |
1806. | 2.075201   .0018553   2004              Comoros |
1874. |  2.02876   .0091369   1982                Ghana |
1972. | 2.039951    .001761   1998              Lesotho |
      |-------------------------------------------------|
1993. | 2.453388   .0029265   2000                Libya |
1994. | 2.895674   .0029461   2001                Libya |
1995. | 3.177117   .0029872   2002                Libya |
      +-------------------------------------------------+

. list stanresid6 lev6 year country_name if (stanresid6<-2 & stanresid6!=.)

      +---------------------------------------------------+
      | stanres~6       lev6   year          country_name |
      |---------------------------------------------------|
  21. | -2.019607   .0041918   2000         United States |
 236. | -2.006241   .0033136   1993                Canada |
 237. | -2.179804   .0032862   1994                Canada |
```

238.	-2.053056	.0032858	1995	Canada
240.	-2.037294	.0033006	1997	Canada
482.	-2.081253	.0015944	1988	South Africa
483.	-2.158044	.0016684	1989	South Africa
490.	-2.352665	.0014081	1996	South Africa
659.	-3.140453	.0013045	1990	Dominican Republic
663.	-2.059042	.0015684	1994	Dominican Republic
665.	-2.078866	.0015759	1996	Dominican Republic
666.	-2.362399	.0016633	1997	Dominican Republic
669.	-2.05383	.0014014	2000	Dominican Republic
671.	-2.376042	.001277	2002	Dominican Republic
672.	-3.063072	.0015517	2003	Dominican Republic
699.	-2.088432	.0015699	1980	Haiti
701.	-3.022237	.0021308	1982	Haiti
702.	-2.708916	.0021955	1983	Haiti
703.	-2.604362	.0022252	1984	Haiti
704.	-3.369032	.0021993	1985	Haiti
705.	-2.49113	.0023925	1986	Haiti
706.	-2.393601	.0023361	1987	Haiti
707.	-2.722527	.0023672	1988	Haiti
708.	-2.886004	.0024454	1989	Haiti
709.	-4.029182	.0024505	1990	Haiti
710.	-2.56934	.0010317	1991	Haiti
722.	-2.314697	.0015695	2003	Haiti
731.	-2.570717	.001434	1988	Honduras
732.	-3.590738	.0013344	1989	Honduras
733.	-2.61424	.001166	1990	Honduras
750.	-2.130579	.0018195	1982	Mexico

762.	-2.137226	.0014275	1994	Mexico
928.	-3.239206	.0022068	1980	Guyana
929.	-3.994931	.0020876	1981	Guyana
930.	-3.053641	.0020154	1982	Guyana
931.	-3.765597	.0022585	1983	Guyana
932.	-3.52656	.0027673	1984	Guyana
933.	-3.800924	.0027511	1985	Guyana
934.	-3.447373	.0029451	1986	Guyana
935.	-3.184341	.0032938	1987	Guyana
936.	-4.299729	.0032207	1988	Guyana
937.	-2.28049	.0024032	1989	Guyana
957.	-2.394582	.0017101	1984	Belize
979.	-2.143684	.001763	1981	Jamaica
981.	-2.595831	.0018026	1983	Jamaica
987.	-2.351088	.0022496	1989	Jamaica
989.	-2.229919	.0020364	1991	Jamaica
1011.	-2.162341	.0036415	1988	Suriname
1253.	-2.01955	.0021064	1983	Syrian Arab Republic
1255.	-2.055349	.0027314	1985	Syrian Arab Republic
1464.	-2.0199	.0014587	1987	Korea, Rep.
1482.	-4.901881	.0049902	1988	Lao PDR
1484.	-2.036508	.0042438	1990	Lao PDR
1779.	-3.012117	.0021293	1998	Cape Verde
1820.	-2.684041	.0022891	1993	Congo, Dem. Rep.
1832.	-2.80062	.00501	1990	Ethiopia
1847.	-2.616349	.002674	1980	Gambia, The
1848.	-2.832048	.0017763	1981	Gambia, The
1850.	-3.284842	.0016652	1983	Gambia, The
1851.	-3.279828	.0018099	1984	Gambia, The

1852.	-3.830328	.0015772	1985	Gambia, The
1941.	-2.632307	.0022921	1992	Kenya
1996.	-4.779747	.0020198	1980	Madagascar
1997.	-2.937575	.0022943	1981	Madagascar
1998.	-3.077834	.0015286	1982	Madagascar
1999.	-2.336883	.0018851	1983	Madagascar
2073.	-2.046827	.001471	1983	Mauritius
2183.	-2.453475	.0023772	1984	Seychelles
2185.	-2.114972	.0024708	1986	Seychelles
2187.	-2.683286	.0022188	1988	Seychelles
2188.	-2.391635	.0022309	1989	Seychelles
2194.	-2.017561	.001897	1995	Seychelles
2195.	-2.417623	.0019077	1996	Seychelles
2196.	-2.320241	.0019261	1997	Seychelles
2197.	-2.795771	.0021601	1998	Seychelles
2198.	-2.491498	.0024146	1999	Seychelles
2200.	-2.149183	.00347	2001	Seychelles
2203.	-2.652884	.0027711	2004	Seychelles
2205.	-2.254709	.0013108	1981	Sierra Leone
2206.	-2.951476	.0015355	1982	Sierra Leone
2208.	-2.364142	.0021706	1984	Sierra Leone
2211.	-2.508051	.002016	1987	Sierra Leone
2212.	-2.683305	.0018259	1988	Sierra Leone
2213.	-3.463759	.001789	1989	Sierra Leone
2214.	-2.617373	.0015294	1990	Sierra Leone
2229.	-2.804056	.0020227	1992	Namibia
2307.	-4.437654	.0030082	1980	Uganda
2312.	-2.067793	.0023785	1985	Uganda

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2313. | -2.279278    .003604   1986                Uganda |
2316. | -3.249107   .0037237   1989                Uganda |
      |---------------------------------------------------|
2336. | -2.047537   .0012809   1984                Zambia |
2349. | -2.643206   .0027268   1999                Zambia |
2366. | -2.232646   .0022561   1991       Solomon Islands |
2434. | -2.049438   .0015612   1993      Papua New Guinea |
2435. | -2.499171   .0016794   1994      Papua New Guinea |
      |---------------------------------------------------|
2608. | -2.072615   .0020806   1998               Ukraine |
2686. | -2.121388   .0012319   1992              Mongolia |
      +---------------------------------------------------+
```

```
list stanresid6 lev6 year country_name
if (stanresid6>2 & stanresid6!=. & lev6 >.00524148)
```

```
      +--------------------------------------+
      | stanre~6       lev6   year   countr~e |
      |--------------------------------------|
1874. |  2.02876   .0091369   1982      Ghana |
      +--------------------------------------+
```

```
list stanresid6 lev6 year country_name
if (stanresid6<-2 & stanresid6!=. & lev6 >.00524148)
```

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