

Table 5
Summary statistics.

	Mean	Median	Standard deviation	Minimum	Maximum
Dependent variables					
Growth over 2 years after crisis	0.030	0.036	0.091	-0.256	0.368
Change in log real GDP in recession after crisis	-0.074	-0.054	0.067	-0.373	-0.003
Economic conditions before banking crisis					
Growth over 5 years of					
Real GDP	0.127	0.146	0.182	-0.564	0.486
Nominal money					
GDP deflator	1.402	0.494	2.754	-0.044	16.069
Change in credit relative to GDP	0.102	0.037	0.319	-1.265	1.523
Debt over GDP in percent	77.350	57.780	79.373	5.042	598.300
Twin currency crisis	0.158	0.000	0.366	0.000	1.000
Twin debt crisis	0.075	0.000	0.265	0.000	1.000
Logarithm of the number of concurrent banking crises	2.516	2.708	0.679	0.000	3.219
Financial markets and deposit insurance					
Stock market open	0.708	1.000	0.457	0.000	1.000
Deposit insurance	0.546	1.000	0.500	0.000	1.000
International trade					
Capital account openness	-0.041	-0.544	1.525	-1.864	2.440
Free international trade	5.772	6.190	2.251	0.000	9.460
EF black-market FX	8.340	9.800	2.922	0.000	10.000
Economic freedom					
EF total	5.655	5.700	1.479	2.600	8.200
EF property rights	5.260	5.300	2.006	1.290	9.250
EF size government	5.619	5.735	1.488	1.910	10.000
EF top tax rate	4.418	4.000	2.831	0.000	10.000
EF regulation	5.660	5.675	1.289	2.350	8.320
EF sound money	6.070	6.390	3.030	0.000	9.740
Demography					
Infant mortality	50.626	32.500	43.848	2.100	160.700
Life expectancy	64.795	67.200	11.543	37.400	82.000
Fertility rate	3.854	3.200	2.014	1.200	7.800
Percent population 15–64	58.888	59.200	7.059	46.700	71.800
Infrastructure					
Phone lines	15.887	5.440	19.781	0.020	69.130
Electricity usage	2,969.725	804.500	5,470.537	31.000	50,064.000
Legal origin					
British	0.188	0.000	0.392	0.000	1.000
France	0.639	1.000	0.482	0.000	1.000
Germany	0.128	0.000	0.335	0.000	1.000
Scandinavia	0.045	0.000	0.208	0.000	1.000
Income level					
High income	0.211	0.000	0.409	0.000	1.000
Middle income	0.256	0.000	0.438	0.000	1.000
Low income	0.444	0.000	0.499	0.000	1.000
Transition	0.090	0.000	0.288	0.000	1.000
Region					
U.K. colony	0.180	0.000	0.386	0.000	1.000
Sub-Saharan Africa	0.301	0.000	0.460	0.000	1.000
Latin America and Caribbean	0.226	0.000	0.420	0.000	1.000
Spanish colony	0.218	0.000	0.414	0.000	1.000
East Asia	0.105	0.000	0.308	0.000	1.000

Note: All observations for which a variable is available are included, whether or not other pertinent variables are available for that observation. The table includes Liberia and the transforming economies. The variable "Negative change in log real GDP in recession after crisis" is the change in the logarithm of real GDP during a recession after the banking crisis if there is a recession. Some of the observations underlying these statistics are excluded from the computations if another included variable is missing.

Table 6
Determinants of real GDP growth two years after a banking crisis for all countries

Variable	Posterior mean coefficient	Posterior standard deviation of coefficient	Posterior inclusion probability	Conditional positive sign
Economic conditions before banking crisis				
Growth over 5 years of				
Real GDP	-0.0031	0.0205	0.030	0.000
Money	8.21×10^{-6}	0.0007	0.010	0.697
GDP deflator	3.20×10^{-5}	0.0008	0.009	0.808
Change in credit relative to GDP	-0.0013	0.0097	0.026	0.000
Debt over GDP in percent	1.37×10^5	0.0001	0.036	1.000
Twin currency crisis	0.0001	0.0025	0.008	0.929
Twin debt crisis	0.0001	0.0030	0.008	0.871
Number of other crises	-0.0011	0.0055	0.050	0.000
Financial markets and deposit insurance				
Stock market open	0.0001	0.0032	0.008	0.871
Deposit insurance	-0.0003	0.0032	0.013	0.000
International trade				
Capital account openness	-0.0014	0.0050	0.091	0.000
EF international trade	-0.0006	0.0027	0.049	0.011
EF black-market FX	-0.0001	0.0007	0.013	0.055
Economic freedom				
EF total	-0.0062	0.0110	0.266	0.000
EF property rights	-0.0003	0.0019	0.026	0.008
EF size government	-0.0001	0.0010	0.012	0.006
EF top tax rate	-3.13×10^{-5}	0.0005	0.011	0.003
EF regulation	-2.90×10^{-5}	0.0016	0.012	0.323
EF sound money	-0.0001	0.0011	0.025	0.079
Demography				
Infant mortality	0.0003	0.0005	0.296	1.000
Life expectancy	-0.0002	0.0009	0.078	0.028
Fertility rate	0.0004	0.0031	0.035	0.876
Percent population 15–64	-0.0007	0.0018	0.142	0.000
Infrastructure				
Phone lines	-0.0001	0.0003	0.049	0.004
Electricity usage	-2.01×10^{-8}	2.50×10^{-7}	0.013	0.003
Legal origin				
France	-0.0002	0.0026	0.011	0.003
Spain	-2.89×10^{-5}	0.0020	0.008	0.405
Germany	-4.59×10^{-5}	0.0025	0.008	0.244
Scandinavia	-0.0001	0.0033	0.008	0.103
Region				
Sub-Saharan Africa	3.42×10^{-5}	0.0039	0.010	0.520
Latin America and Caribbean	0.0001	0.0023	0.009	0.741
East Asia	-0.0001	0.0026	0.008	0.061
Income level				
Middle income	0.0001	0.0024	0.010	0.714
Low Income	0.0001	0.0025	0.009	0.754
Transition	-0.0020	0.0116	0.037	0.000

Note: The dependent variable is the growth of real GDP from the year of the banking crisis to two years later. There are 133 observations. The dummy variables for a British legal origin with high income and having been a U.K. colony are deleted as they are the base case. The prior mean number of regressors is 6 and the prior probability of each variable being included is 0.171. The estimated mean number of regressors is 1.45.

that nothing matters. Perhaps this is correct for this set of countries. There simply may be too much heterogeneity to draw any generalizations.

Table 9 presents estimates for banking crises in low-income countries. Here the prior probability of some of the variables being important, while not overwhelming or as strong as the high-income countries, is consistent with there being an underlying set of factors. The low-income countries appear different from the high-income countries. Crisis-specific factors matter, with the variable for a crisis in East Asia having the highest posterior probability of inclusion, 0.39. A twin-debt crisis also

Table 7

Determinants of real GDP growth two years after a banking crisis for high-income countries.

Variable	Posterior mean coefficient	Posterior standard deviation of coefficient	Posterior inclusion probability	Conditional positive sign
Economic conditions before banking crisis				
Growth over 5 years of				
Real GDP	0.0114	0.0616	0.111	0.839
Money	-0.0106	0.0428	0.209	0.217
GDP deflator	-0.1032	0.2450	0.214	0.050
Change in credit relative to GDP	-0.0294	0.0441	0.404	0.015
Debt over GDP in percent	-0.0002	0.0005	0.312	0.032
Twin currency crisis	-0.0792	0.1497	0.358	0.015
Twin debt crisis				
Number of other crises	-0.0294	0.0731	0.243	0.014
International trade				
Capital account openness	-0.0037	0.0125	0.182	0.127
EF international trade	0.0008	0.0330	0.159	0.547
EF black-market FX	0.1746	0.4550	0.201	0.906
Economic freedom				
EF total	-0.0022	0.1634	0.133	0.584
EF property rights	0.0003	0.0322	0.125	0.455
EF size government	0.0048	0.0326	0.180	0.8123
EF top tax rate	-0.0003	0.0020	0.097	0.191
EF regulation	0.0010	0.0356	0.122	0.499
EF sound money	-0.0144	0.0565	0.185	0.181
Demography				
Infant mortality	-0.0004	0.0091	0.172	0.694
Life expectancy	-0.0001	0.0054	0.210	0.400
Fertility rate	0.0002	0.0154	0.106	0.499
Percent population 15–64	-0.0006	0.0054	0.138	0.303
Infrastructure				
Phone lines	-0.0004	0.0011	0.198	0.038
Electricity usage	7.64×10^{-7}	1.97×10^{-6}	0.204	0.878
Legal origin				
France	0.0085	0.0247	0.192	0.852
Germany	-9.84×10^{-6}	0.0208	0.144	0.580
Scandinavia	0.0053	0.0181	0.167	0.810
Region				
East Asia	-0.0100	0.0474	0.150	0.252

Note: The dependent variable is the growth of real GDP from the year of the banking crisis to two years later. There are 28 observations. The dummy variables for income are deleted because these are only high-income countries. The variables for a stock market being open and deposit insurance are deleted because all countries have stock markets and deposit insurance. Other dummy variables are deleted because they never are nonzero for high-income countries. The variables are dummy variables for a twin debt crisis, a Spanish legal system, Sub-Saharan Africa, and Latin America and the Caribbean. The number of burn-in draws is 100,000 and the number of draws for the Monte Carlo estimation is 400,000,000. The prior mean number of regressors is 6 and the prior probability of each variable being included is 0.231. The estimated mean number of regressors is 4.92.

has a posterior inclusion probability of 0.35. Being in East Asia and having a debt crisis are associated with a combined 17 percent lower real GDP after two years. This conjunction occurs in our data for the Philippines in 1983. A higher top income-tax rate also has a negative association with real GDP growth on average. Factors with a positive association with real GDP over the two years after a banking crisis include having a stock market, having more phone lines (and presumably more developed with better communication within the country). There are nine variables in all that have posterior inclusion probabilities of 30 percent or more. They include only one prior economic condition, but it is the change in credit which is important for high-income countries. Deposit insurance has an inclusion probability of 29 percent and a positive expected association with real GDP of two percentage points.

Table 8

Determinants of real GDP growth two years after a banking crisis for middle-income countries

Variable	Posterior mean coefficient	Posterior standard deviation of coefficient	Probability of inclusion	Conditional positive sign
Economic conditions before banking crisis				
Growth over 5 years of				
Real GDP	-0.0332	0.1238	0.166	0.077
Money	0.0017	0.0158	0.026	0.872
GDP deflator	-0.0009	0.0111	0.025	0.474
Change in credit relative to GDP	-0.0027	0.0222	0.028	0.002
Debt over GDP in percent	0.0003	0.0009	0.148	1.000
Twin currency crisis	0.0059	0.0483	0.028	0.986
Twin debt crisis				
Number of other crises	0.0014	0.0112	0.027	0.962
Financial markets and deposit insurance				
Deposit insurance	0.0028	0.0494	0.060	0.215
International trade				
Capital account openness	-0.0008	0.0059	0.032	0.001
EF international trade	0.0016	0.0154	0.027	0.515
EF black-market FX	0.0001	0.0018	0.024	0.612
Economic freedom				
EF total	-0.0079	0.0804	0.030	0.109
EF property rights	-0.0001	0.0101	0.028	0.258
EF size government	0.0023	0.0232	0.029	0.468
EF top tax rate	-0.0003	0.0021	0.045	0.125
EF regulation	0.0022	0.0203	0.027	0.755
EF sound money	0.0018	0.0175	0.025	0.648
Demography				
Infant mortality	0.0001	0.0009	0.031	0.972
Life expectancy	0.0005	0.0056	0.029	0.458
Fertility rate	0.0003	0.0073	0.023	0.801
Percent population 15–64	-0.0005	0.0029	0.042	0.000
Infrastructure				
Phone lines	-0.0002	0.0020	0.025	0.095
Electricity usage	0.0000	0.0000	0.023	0.077
Legal origin				
France	-0.0040	0.0391	0.025	0.324
Spain	0.0058	0.0526	0.025	0.587
Region				
Latin America and Caribbean	-0.0158	0.1372	0.029	0.022
East Asia	-0.0055	0.0582	0.026	0.363

Note: The dependent variable is the growth of real GDP from the year of the banking crisis to two years later. There are 34 observations. The dummy variables for income are deleted because only middle-income countries are included in the computations. The dummy variable for a stock market being open is deleted because all countries have stock markets. Other dummy variables are deleted because they never are nonzero for middle-income countries. Dummy variables deleted are those for a twin debt crisis, a German or Scandinavian legal system and for Sub-Saharan Africa. The prior mean number of regressors is 6 and the prior probability of each variable being included is 0.222. The estimated mean number of regressors is 1.05.

6. Conclusion

We have considered the output costs associated with banking crises using cross country data for years after 1970. In addition, we examine what variables help to predict the output changes after a banking crisis. Our work departs from most of the previous work in the literature in two fundamental ways. First, we eschew measures of output losses based on trend or potential GDP. It is well known that estimates of potential output even for the United States in any given year can be quite different. Any broad based set of countries will contain countries that have not entered predictable modern economic growth as well as countries affected by coups, decreases in natural-resource prices and other events. We show how difficult it is to objectively estimate potential GDP for a broad based set of countries. It is well nigh impossible to find any procedure to determine potential GDP for such a heterogeneous group in a consistent objective fashion.

Table 9

Determinants of real GDP growth two years after a banking crisis for low-income countries

Variable	Posterior mean coefficient	Posterior standard deviation of coefficient	Posterior inclusion probability	Conditional positive sign
Economic conditions before banking crisis				
Growth over 5 years of				
Real GDP	0.0366	0.1989	0.1682	0.778
Money	−0.0080	0.0564	0.1528	0.356
GDP deflator	−0.0070	0.0587	0.1781	0.298
Change in credit relative to GDP	0.0819	0.1680	0.2971	0.923
Debt over GDP in percent	3.69×10^{-5}	0.0002	0.1464	0.8000
Twin currency crisis	0.0080	0.0599	0.2088	0.597
Twin debt crisis	−0.0801	0.1581	0.3519	0.044
Number of other crises	−0.0050	0.0218	0.1699	0.238
Financial markets and deposit insurance				
Stock market open	0.0291	0.0553	0.3123	0.968
Deposit insurance	0.0192	0.0508	0.2711	0.879
International trade				
Capital account openness	0.0010	0.0092	0.1561	0.661
EF international trade	0.0014	0.0365	0.1774	0.641
EF black-market FX	0.0025	0.0123	0.1756	0.773
Economic freedom				
EF total	−0.0108	0.1730	0.2005	0.285
EF property rights	0.0024	0.0413	0.1527	0.566
EF size government	0.0203	0.0434	0.3476	0.929
EF top tax rate	−0.0131	0.0242	0.3118	0.053
EF regulation	0.0012	0.0433	0.1512	0.590
EF sound money	−0.0059	0.0372	0.2172	0.090
Demography				
Infant mortality	0.0003	0.0010	0.1987	0.835
Life expectancy	−0.0015	0.0067	0.2225	0.244
Fertility rate	0.0123	0.0388	0.2278	0.854
Percent population 15–64	0.0046	0.0091	0.2968	0.952
Infrastructure				
Phone lines	0.0275	0.0524	0.3199	0.929
Electricity usage	7.80×10^{-5}	0.0001	0.1502	0.5925
Legal origin				
France	−0.0317	0.0806	0.2935	0.093
Spain	0.0072	0.0866	0.2351	0.442
Region				
Sub-Saharan Africa	0.0042	0.0757	0.2089	0.609
East Asia	−0.0861	0.1394	0.3759	0.048

Note: The dependent variable is the growth of real GDP from the year of the banking crisis to two years later. There are 59 observations. The dummy variables for income are deleted because only middle-income countries are included in the computations. Other dummy variables are deleted because they never are nonzero for low-income countries. Dummy variables deleted are those for a German or Scandinavian legal system and for Latin America and the Caribbean. The prior mean number of regressors is 6 and the prior probability of each variable being included is 0.207. The estimated mean number of regressors is 6.68.

Some of the literature has focused on countries that experience contractions in output, but countries that experience no contraction at all can be very informative. This is laying aside the observation that, because of measurement errors, it is impossible to be sure for many countries that a decrease in real GDP of one percent really is different from an increase of one percent. For both reasons, we examine output for all economies and not just those which experience a contraction after a banking crisis.

Our estimates of the output costs of contractions associated with banking crises have implications for recent debates. There is broad agreement among researchers that severe crises associated with events such as the Great Depression or the recent financial crisis have very large output effects. The dispute in the literature is whether *all* banking crises can be characterized as having severe effects on real activity. The post-1970 cross-country data show that many banking crises are not associated